3GPP TSG-RAN WG2 Meeting #124 R2-23xxxxx

Chicago, Illinois, USA, 13-17 November 2023

Source: Session Chair (MediaTek)

Title: Report from session on positioning and sidelink relay

# 4 EUTRA Rel-17 and earlier

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

## 4.4 Positioning corrections Rel-16 and earlier

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

This Agenda Item will be handled by email.

# 5 NR Rel-15 and Rel-16

Essential corrections only.

Tdoc Limitation: 5 tdocs in total for all sub agenda items.

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

## 5.3 NR Positioning Support

(NR\_newRAT-Core; leading WG: RAN1; REL-15; started: Mar. 17; closed: Jun. 19: WID: [RP-191971](http://ftp.3gpp.org/tsg_ran/TSG_RAN/TSGR_85/Docs/RP-191971.zip))

(NR\_pos-Core; leading WG: RAN1; REL-16; started: Mar 19; target; Jun 20; WID: [RP-200218](http://ftp.3gpp.org/tsg_ran/TSG_RAN/TSGR_87e/Docs/RP-200218.zip)).

(NR TEI16 Positioning)

### 5.3.0 In Principle Agreed CRs

[R2-2312270](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312270%20Correction%20to%2038.331%20on%20GNSS-ID%20R16_final.docx) Correction to 38.331 on GNSS-ID Huawei, HiSilicon CR Rel-16 38.331 16.14.0 4417 - F NR\_pos-Core

* Agreed

[R2-2312271](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312271%20Correction%20to%2038.331%20on%20GNSS-ID%20R17_final.docx) Correction to 38.331 on GNSS-ID Huawei, HiSilicon CR Rel-17 38.331 17.6.0 4418 - A NR\_pos-Core

* Agreed

### 5.3.1 General and Stage 2 corrections

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

[R2-2312306](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312306-38305-multi-rtt-sequence-correction.docx) Sequence of Procedure for Multi-RTT positioning correction Apple CR Rel-16 38.305 16.9.0 0148 - F NR\_pos-Core

Discussion:

vivo think the change is essential as the existing typo could lead to real confusion with the on-demand PRS procedure.

Lenovo think we could do other cleanup corrections at the same time: Steps 5a/5b/5c are not properly identified in the procedure, and there is a spurious step 13.

* [AT124][410][POS] Rel-16 multi-RTT positioning sequence (Apple)

Scope: Update the CR in R2-2312306 and the shadow CR in R2-2312307 to take into account the comments on steps 5a/5b/5c and 13.

Intended outcome: Agreed CRs (without CB if possible) in R2-2313799 and R2-2313800

Deadline: Thursday 2023-11-16 1900 CST

[R2-2312307](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312307-38305-multi-rtt-sequence-correction-r17.docx) Sequence of Procedure for Multi-RTT positioning correction Apple CR Rel-17 38.305 17.6.0 0149 - A NR\_pos-Core

### 5.3.2 Stage 3 corrections (RRC/LPP/MAC/capabilities)

[R2-2313241](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2313241%20REL-16%20CR%2037355%205_3_2%20Positioning%20Frequency%20Layer.docx) Definition of Positioning Frequency Layer Nokia, Nokia Shanghai Bell CR Rel-16 37.355 16.12.0 0483 - F NR\_pos-Core

* Not pursued (issue can be addressed in Rel-18 running LPP CR)

Discussion:

Ericsson think this is not needed, and if any clarification is needed it should come from a RAN1 spec.

Huawei think the CR is OK, but the definition can be simplified; they consider that a PFL is just a collection of DL-PRS configurations with similar characteristics. They would like to clarify if there is something different in the Rel-17 CR.

Samsung support introducing the definition, but they see a need to send an LS to RAN1 to check the content.

Intel agree with Ericsson that nothing is broken and the CR is not essential.

vivo also agree with Ericsson, and they see some issues with the definition in the CR.

Nokia think it is useful to have a definition of a term we use. They understand the Rel-17 CR could be a category A, and they think no check with RAN1 is necessary since the definition came from 38.214.

ZTE agree with Ericsson and others, and they think RAN1 already have the definition and we should not duplicate it in LPP.

Xiaomi think the term is used throughout LPP, so they support the CR.

OPPO think we could refer to the RAN1 spec. CATT would like to check offline.

Nokia think we could refer to 38.214 from some of the places where it is used.

Huawei think adding RAN1 references would be more work than just adding a definition. Nokia agree.

Ericsson think we could just put a reference in the first place it is used.

Intel think we should not take this change in Rel-16 and we should not define everything.

Ericsson think it could be handled in the Rel-18 LPP rapporteur CR. Intel would prefer to see a TEI18. CATT understand that the change is partly related to CPP, so it would be reasonable to take in the Rel-18 WI CR.

Qualcomm checked and we use “positioning frequency layer” 41 times; they think we should have a definition.

Nokia indicate that the intention is not specific to CPP.

Intel think a definition would be better.

Nokia think the concept is important and it would be good to have an explicit definition.

# 6 NR Rel-17

Essential corrections only. Editorial/clarifications should be sent to be reviewed and approved by spec rapporteurs prior to submission. Editiorials should only be submitted by spec rapporteurs.

## 6.2 NR Sidelink relay

(NR\_SL\_Relay-Core; leading WG: RAN2; REL-17; WID: [RP-212601](http://ftp.3gpp.org/tsg_ran/TSG_RAN/TSGR_93e/Docs/RP-212601.zip))

Tdoc Limitation: 1 tdoc

### 6.2.0 In Principle Agreed CRs

[R2-2311885](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2311885_38304_CR0353_(REL-17)%20-%20Correction%20on%20SIB%20and%20Preconfiguration%20applicability.docx) Correction on SIB/Preconfiguration applicability OPPO, ZTE CR Rel-17 38.304 17.6.0 0353 2 F NR\_SL\_enh-Core, NR\_SL\_relay-Core R2-2311379

* Agreed as R2-2313791 (coversheet descriptions)

Discussion:

Huawei would prefer to discuss the related contributions in this meeting first.

OPPO recall that we intentionally removed a change where there was no convergence, and this CR only contains the changes that really had consensus, so they think the discussion can be independent.

Ericsson think a coversheet update is needed.

[R2-2312688](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\38331_CR4389r1_(Rel-17)_R2-2312688%20RRC%20corrections%20for%20SL%20relay.docx) RRC corrections for SL relay Huawei, HiSilicon, CATT, Apple, ZTE, China Telecom, Philips International B.V., Lenovo, Xiaomi CR Rel-17 38.331 17.6.0 4389 1 F NR\_SL\_relay-Core R2-2311380

* Agreed

### 6.2.1 Other

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

SIB12 and preconfiguration

[R2-2312614](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312614%20Applicability%20of%20SIB12%20for%20remoteUE.docx) Considerations on applicability of SIB12 received via relay connection Nokia, Nokia Shanghai Bell discussion Rel-17 NR\_SL\_relay-Core

* Noted

Proposal 1: An out-of-coverage L2 U2N Remote UE may use its SL-PreconfigurationNR for non-relay SL communication/discovery without considering SIB12 received via a relay connection.

Proposal 2: Adopt the following text proposal in clause 8.1 of TS 38.304 as in the Annex of this document.

[R2-2312624](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312624.docx) Correction on pre-configuration usage Xiaomi Technology CR Rel-17 38.304 17.6.0 0360 - F NR\_SL\_relay\_enh-Core

* Postponed

[R2-2313477](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2313477-Clarification%20on%20preconfiguration%20in%20U2N%20relay.docx) Clarification on preconfiguration usage in U2N relay Qualcomm Incorporated discussion Rel-17 NR\_SL\_relay-Core

* Noted

Proposal 1: UE is allowed to use preconfiguration if SIB12 does not provide configuration for the concerned frequency.

Proposal 2: Agree the text proposal for TS 38.304 change as following.

[R2-2313513](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\38304_CR0368_(Rel-17)_R2-2313513%20Clarification%20on%20the%20case%20SL%20frequency%20is%20not%20included%20in%20SIB12.docx) Clarification on the case SL frequency is not included in SIB12 Huawei, HiSilicon CR Rel-17 38.304 17.6.0 0368 - F NR\_SL\_relay-Core

* Postponed

Discussion (joint for above 4 documents):

Ericsson see some interaction with Rel-18 U2U. NEC do not see that there is a connection.

Huawei think it is not related to U2U because the coverage extension is specific to U2N. They see no impact to Rel-18 WI closure and think it would be OK to postpone.

Xiaomi also think there is no relation to U2U or Rel-18 generally. They think we could try to converge offline this meeting.

Qualcomm think it is not related to U2U and would be OK to postpone.

Other CRs

[R2-2312342](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312342%2038331_R17_relay_Correction_destinaiton_list%20_r1.docx) Correction on the SL destinaitons in SUI message Apple, Huawei, HiSilicon CR Rel-17 38.331 17.6.0 4424 - F NR\_SL\_relay-Core

Discussion:

NEC think the NOTE in Alt 1 is enough, but they think the wording can be improved.

Nokia prefer the normative solution, but they can live with the NOTE.

Lenovo think the NOTE is not needed because the same sentence is there in the field description.

* [AT124][412][Relay] Rel-17 CR on destinations in SUI message (Apple)

Scope: Implement Alt 1 of R2-2312342 and allow companies to check the wording.

Intended outcome: Agreed CR (without CB if possible) in R2-2313801

Deadline: Thursday 2023-11-16 1900 CST

[R2-2313099](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Docs\R2-2313099.zip) Correction on SL relay RRC Philips International B.V. CR Rel-17 38.331 17.6.0 4466 - F NR\_SL\_relay-Core

Discussion:

Lenovo think the first change is not needed, because the behaviour is captured for the receiver side and not needed for the transmitter side. Philips think if the transmitter does not set the setup value, the receiver behaviour will never be invoked.

Huawei think the first change is functionally obvious and does not need to be documented; we do not always document the setup field. For the second change, they think there is a mistake in the current implementation and the change is OK, and the third change is editorial.

Xiaomi have some sympathy for the first change because the transmitter is a UE; it’s OK that we do not always document it on the network side, but this is different.

OPPO tend to agree with Huawei that the behaviour is obvious.

* [AT124][413][Relay] Sidelink RRC CR implementation correction (Philips)

Scope: Implement and check changes 2 and 3 of R2-2313099.

Intended outcome: Agreed CR (without CB if possible) in R2-2313802

Deadline: Thursday 2023-11-16 1900 CST

[R2-2313354](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\38351_CR0028_(Rel-17)_R2-2313354%20Correction%20on%20SRAP%20for%20sidelink%20relay.docx) Correction on SRAP for sidelink relay ZTE, Sanechips CR Rel-17 38.351 17.6.0 0028 - F NR\_SL\_relay-Core

* Not pursued

Apple think the current text is clear because the whole paragraph applies to SRB1 and the missing corresponding channel can only happen for SRB1.

Huawei have the same understanding as Apple that there is no failure mode today, so they see the change as not essential.

[R2-2313458](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2313458%20-%2038.300_CR0744_Rel17_Correction%20on%20the%20SidelinkUEInformationNR%20message.docx) Correction on the SidelinkUEInformationNR message Ericsson, Apple, Vivo CR Rel-17 38.300 17.6.0 0744 - F NR\_SL\_relay-Core

* “Then” to be removed in the first added sentence
* Agreed as R2-2313798

Discussion:

NEC think there is already a similar description in 38.331 and the CR is redundant. Ericsson agree but think the stage 2 should be aligned.

NEC doubt if the updated wording is in the correct place; they understand that the SUI should be sent earlier. Apple think this is only applicable for the RRC\_CONNECTED case; NEC agree and think the update is OK for idle/inactive.

Apple suggest removing “Then” in the first added sentence. NEC could be OK with this.

OPPO agree that the SUI does not have a relationship with RRC setup for the remote UE. Ericsson think the SUI has to be triggered by the time the relay UE forwards the first message, but they think removing “Then” can clarify that there is no strict causal relationship.

Not available/Withdrawn

R2-2312932 Correction on the SidelinkUEInformationNR message Ericsson, Apple, Vivo CR Rel-17 38.300 17.6.0 0719 1 F NR\_SL\_relay-Core R2-2311220 Withdrawn

## 6.4 NR positioning enhancements

(NR\_pos\_enh-Core; leading WG: RAN1; REL-17; WID: [RP-210903](http://ftp.3gpp.org/tsg_ran/TSG_RAN/TSGR_91e/Docs/RP-210903.zip))

Tdoc Limitation: 1 tdoc

### 6.4.0 In Principle Agreed CRs

[R2-2311868](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2311868%20Clarification%20on%20the%20field%20description%20of%20dl-prs-ResourceSetPeriodicityReq.docx) Clarification on the field description of dl-prs-ResourceSetPeriodicityReq vivo CR Rel-17 37.355 17.6.0 0477 - F NR\_pos\_enh-Core Revised

* Revised in R2-2313538 (coversheet)

[R2-2313538](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2313538%20Clarification%20on%20the%20field%20description%20of%20dl-prs-ResourceSetPeriodicityReq.docx) Clarification on the field description of dl-prs-ResourceSetPeriodicityReq vivo CR Rel-17 37.355 17.6.0 0477 1 F NR\_pos\_enh-Core R2-2311868

* Agreed

[R2-2312445](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312445%20Correction%20on%20LocationMeasurementIndication%20procedure%20for%20positioning.docx) Correction on LocationMeasurementIndication procedure for positioning ZTE Corporation, Ericsson CR Rel-17 38.331 17.6.0 4336 2 F NR\_pos\_enh-Core R2-2311377

* Agreed

[R2-2313418](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2313418%20HAGNSS.docx) Field description correction for HA-GNSS metrics Ericsson CR Rel-17 37.355 17.6.0 0474 2 F NR\_pos\_enh-Core R2-2311378

* Agreed

[R2-2313555](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2313555_(TEG%20Capability).docx) Correction to UE TEG Capability Qualcomm Incorporated CR Rel-17 37.355 17.6.0 0475 1 F NR\_pos\_enh-Core R2-2310909

* Agreed

Not available/Withdrawn

R2-2312935 Field description correction for HA-GNSS metrics Ericsson CR Rel-17 37.355 17.6.0 0479 - F NR\_pos\_enh-Core Withdrawn

### 6.4.1 Other

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

Including outcome of [Post123bis][402][POS] BDS B1C corrections (CATT)

Incoming LS with “take into account” action

[R2-2311718](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2311718_R1-2310675.doc) Reply LS on support of multiple location estimate instances in a single measurement (R1-2310675; contact: ZTE) RAN1 LS in Rel-17 NR\_pos\_enh-Core To:RAN2

* Noted

Additional incoming LS

[R2-2311703](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2311703_C4-234472.docx) LS Out Sub One Second Report Period for Deferred Location over SBI (C4-234472; contact: Ericsson) CT4 LS in Rel-17 5G\_eLCS\_ph2 To:RAN2, RAN3

* Postponed

Discussion:

Qualcomm think this is independent of LPP and NRPPa; it only relates to how often the UE evaluates the events. They understand that the SS message has been changed and no LPP change is needed.

Huawei are not sure why this comes up in Rel-17; they understand that the SA2 agreement was for Rel-18. Qualcomm indicate that CT4 took their agreement for Rel-17 (and the LS is labelled for Rel-17).

ZTE note that Ericsson provided a related proposal in Rel-18 integrity. Ericsson indicate that the outcome would be the same but the context is different.

vivo agree with Qualcomm and understand that SA2 are discussing whether to use the periodic report to support deferred MT-LR; if they decide to do so, maybe the change is reasonable in Rel-19. Ericsson think we should avoid mixing discussions from different efforts in different groups, and they understand that it is a wider discussion than just deferred MT-LR.

Qualcomm think the LS is clear, but we need to see what the impact on LPP would be; they think we should not repeat the same discussion.

Nokia agree with Qualcomm.

Email discussion report and related CRs

[R2-2313344](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2313344%20Report%20of%20%5bPost123bis%5d%5b402%5d%5bPOS%5d%20BDS%20B1C%20corrections%20(CATT).docx) Report of [Post123bis][402][POS] BDS B1C corrections (CATT) CATT discussion Rel-17 NR\_pos\_enh-Core

Proposal 1: unicast and broadcast of BDS B1C SSR data transmission are included in one Rel-17 CR set.

Discussion:

Ericsson do not see the need; they think some issues have been misunderstood, and there is no need for devices to get the newer signal to function; they understand that devices supporting B1C will also support the older signal.

CATT indicate that the correction data source in China is providing only B1C; there is no B1I correction data set in the China market and we need to meet the market requirement. They also indicate that the dual-frequency operation recommended with B1C is B2A, not B1I.

Swift understand that there is nothing prohibiting corrections being produced for B1C, but the issue is which ephemeris we use as reference. If there is a single-frequency B1C-only device, they are not sure how much use the corrections are, and today they understand that the BDS satellites carrying B1C always carry B1I, so referencing to the B1I ephemeris still works.

CATT understand that corrections based on B1I are not available in China, so there is an operator need to use the corrections based on B1C so that SSR with BDS can be supported.

Ericsson think adding options opens a can of worms, and we should be sure that it is absolutely necessary. They think networks need to consider the possibility of devices that only support one reference.

Chair does not see an alternative to supporting it if there are markets with only B1C corrections. Intel agree.

vivo think the issue is valid; if the source only provides B1C information, then B1C information needs to be distributed, and they do not see a compatibility problem with the change.

Ericsson think normally when there is a gap, market forces will close it. They wonder if the situation with B1C corrections only will remain.

CATT understand the changes meet compatibility requirements and they have not seen a big concern from companies; the CRs introduce a new posSIB, so there should be no impact on existing corrections.

Ericsson have a concern about the resource cost of deploying the changes for a network that needs to support both kinds of devices.

CATT understand that the data are optional from LMF perspective, and what is provided is out of control of 3GPP. They see no requirement for the network to support both.

Huawei agree with CATT that it is optional, and they do not think the resource cost is an issue considering that the posSIBs can be provided on-demand.

OPPO agree with Huawei and CATT.

Swift think there is not consensus yet on the details of the CRs, and they would like some more time to review. They acknowledge that there are services with multiple ephemeris types and a solution should be found, but if we generate a parallel SSR configuration, we should generalise how such cases can be handled.

Huawei have some confusion about the capability/compatibility issue. There is a UE capability in the CR, and they understand that this means the network can configure whatever it wants based on the UE capability, so they see no compatibility issue.

Proposal 2: A new capability should be defined in 37.355 for unicast.

Proposal 3: GNSS-ID should not be changed to keep consistence, otherwise different GNSS-ID definitions in 38.331 and 37.355 will bring confusion.

Proposal 4: A new posSibType (e.g. posSibType2-26) is defined to contain all SSR assistant data which refers to a non-default broadcast ephemeris, e.g. BDS B1C.

Discussion:

Qualcomm think P4 does not make sense, because it forces the new posSIB to be large to incorporate all the SSR assistance data. They see that the only aspect that depends on the ephemeris is the clocks, and they think extending the orbit corrections and adding a new posSIB for just that extension makes sense.

CATT indicate that only clock and orbit are required, so they are willing to reduce the assistance data.

Swift think there would be a backward compatibility issue if we included all the SSR assistance data, but clock and orbit should be OK. They would like time to review the CR.

Proposal 4a: Delta signalling is not used to avoid the complexity for server and devices and to avoid the discussion of unstable value ranges for each delta parameters.

Discussion:

Ericsson understand that if both posSIBs are broadcast, there could be an ambiguity in which data to apply, and the intention was to apply a delta. They think the discussion can be taken in CR review.

CATT understand that there will be no ambiguity because there are separate posSIBs, and they do not see the benefit of delta signalling in a market with no B1I corrections.

Agreements:

Unicast and broadcast of BDS B1C SSR data transmission are included in Rel-17.

A new capability should be defined in 37.355 for unicast.

GNSS-ID should not be changed to keep consistence, otherwise different GNSS-ID definitions in 38.331 and 37.355 will bring confusion.

A new posSibType (e.g. posSibType2-26) is defined to contain the clock and orbit corrections referenced to B1C.

Delta signalling against the B1I corrections is not used to avoid the complexity for server and devices and to avoid the discussion of unstable value ranges for each delta parameters. Details of the signalling formats can be discussed in CR review.

[R2-2313342](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\38331_CR4489_(Rel-17)-R2-2313342.docx) Correction on transmission of SSR Assistance Data based on BDS B1C CATT, CAICT, CMCC, China Telecom, China Unicom, Huawei, ZTE Corporation, MediaTek Inc., OPPO, xiaomi, vivo, Spreadtrum CR Rel-17 38.331 17.6.0 4489 - F NR\_pos\_enh-Core

[R2-2313343](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\37355_CR0485_(Rel-17)-R2-2313343.docx) Correction on transmission of SSR Assistance Data based on BDS B1C CATT, CAICT, CMCC, China Telecom, China Unicom, Huawei, ZTE Corporation, MediaTek Inc., OPPO, xiaomi, vivo, Spreadtrum CR Rel-17 37.355 17.6.0 0485 - F NR\_pos\_enh-Core

[R2-2313504](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\36331_CR4979_(Rel-17)-R2-2313504.docx) Correction on transmission of SSR Assistance Data based on BDS B1C CATT, CAICT, CMCC, China Telecom, China Unicom, Huawei, ZTE Corporation, MediaTek Inc., OPPO, xiaomi, vivo, Spreadtrum CR Rel-17 36.331 17.6.0 4979 - F NR\_pos\_enh-Core

* [AT124][411][POS] BDS B1C corrections CR review (CATT)

Scope: Check the CRs in R2-2313342, R2-2313343, and R2-2313504 and produce revisions if necessary.

Intended outcome: Agreeable CRs in R2-2313803 / R2-2313804 / R2-2313805

Deadline: Thursday 2023-11-16 1000 CST (for final CR availability)

R2-2313803 Correction on transmission of SSR Assistance Data based on BDS B1C CATT, CAICT, CMCC, China Telecom, China Unicom, Huawei, ZTE Corporation, MediaTek Inc., OPPO, xiaomi, vivo, Spreadtrum CR Rel-17 38.331 17.6.0 4489 1 F NR\_pos\_enh-Core

R2-2313804 Correction on transmission of SSR Assistance Data based on BDS B1C CATT, CAICT, CMCC, China Telecom, China Unicom, Huawei, ZTE Corporation, MediaTek Inc., OPPO, xiaomi, vivo, Spreadtrum CR Rel-17 37.355 17.6.0 0485 1 F NR\_pos\_enh-Core

R2-2313805 Correction on transmission of SSR Assistance Data based on BDS B1C CATT, CAICT, CMCC, China Telecom, China Unicom, Huawei, ZTE Corporation, MediaTek Inc., OPPO, xiaomi, vivo, Spreadtrum CR Rel-17 36.331 17.6.0 4979 1 F NR\_pos\_enh-Core

Batch reporting

[R2-2312269](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312269%20Correction%20to%20UE%20capability%20for%20batch%20reporting.docx) Correction to UE capability for batch reporitng Huawei, HiSilicon CR Rel-17 37.355 17.6.0 0478 - F NR\_pos\_enh-Core

* Agreed

[R2-2313361](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2313361%20capability.docx) Correction to UE capability for batch reporitng Ericsson CR Rel-17 37.355 17.6.0 0486 - F NR\_pos\_enh-Core

* Not pursued

Discussion:

Ericsson indicate that there is no RAN1 guidance for this feature. They understand that the multiple reporting was intended for measurements only.

Huawei think Ericsson’s point is out of step with the current spec, which already supports multiple location reporting; they understand that this is also in line with the Rel-17 parameter list, and the question is only whether there should be a capability.

vivo have the same view as Huawei and note that RAN1 did not revert the agreement to have multiple location estimates in the signalling.

Qualcomm have the same understanding as vivo and Huawei; the feature is there and the capability was forgotten.

OPPO agree with Ericsson that the scenario for reporting location multiple times is not valid, and if RAN1 cannot reach consensus, RAN2 should not pursue it.

CATT agree with vivo/Huawei/Qualcomm, and they understand that the LS was just about the capability, not the feature. Samsung also agree and think we do not need to revert the existing support.

ZTE support the CR from Huawei and think we should focus on how we implement the capability; they think we could address it in the field description rather than add a new capability.

Ericsson still think the use case is not justified.

Qualcomm think we implemented the RAN1 agreements and we are just discussing whether there should be a capability. Intel agree that the feature is already there and the question is just capability.

Apple could in theory agree with Ericsson, but realistically they think the way forward is to introduce a new capability.

Ericsson can accept the majority view and think Huawei’s approach is preferable to making the existing capability do double duty.

Other CRs

[R2-2313060](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2313060.docx) Missing correction for SBAS ID presence in Rel-17 SI scheduling MediaTek Inc., Ericsson CR Rel-17 38.331 17.6.0 4462 - F NR\_pos\_enh-Core

* Revised in R2-2313797 (TEI17 tag)

Discussion:

Lenovo think strictly speaking this is a functional NBC. Chair thinks it does not break something that already worked.

Huawei are fine with the CR but think it should be connected to a TEI17 change ([SI\_Scheduling]?) Ericsson think it is a grey area.

Nokia also think it is an NBC and they wonder if we could do a field description.

[R2-2313100](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Docs\R2-2313100.zip) Correction on posSIB(s) acquisition Philips International B.V. CR Rel-17 38.331 17.6.0 4467 - F NR\_pos\_enh-Core

* Postponed

Discussion:

Ericsson think it is not necessary to describe behaviour for every extended field.

ZTE support the CR since the new extension field has a separate name as well as the “type1” and “type2” SIBs. They think the first paragraph of the change should include “containing type 2 SIB”.

OPPO think the conditions for at least some changes do not apply to the new scheduling list, and a revision may be needed.

Lenovo think a similar CR was previously not pursued in the main session. They also note that there are a lot of changes here and some clarification may be needed.

Nokia agree with ZTE that the CR is OK except for the type 2 qualifier.

Philips understand that the CR in the main session was technically different.

Huawei agree with Ericsson, and if something is needed it should start from Rel-16.

[R2-2313242](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2313242%20REL-17%20CR%2037355%206_4_1%20Positioning%20Frequency%20Layer.docx) Definition of Positioning Frequency Layer Nokia, Nokia Shanghai Bell CR Rel-17 37.355 17.6.0 0484 - F NR\_pos\_enh-Core

=> Not pursued

# 7 Rel-18

## 7.2 Expanded and improved NR positioning

(NR\_pos\_enh2; leading WG: RAN1; REL-18; WID: [RP-232670](http://ftp.3gpp.org/tsg_ran/TSG_RAN/TSGR_101/Docs/RP-232670.zip))

Time budget: 2 TU

Tdoc Limitation: 4 tdocs

### 7.2.1 Organizational

Including incoming LSs and rapporteur inputs.

Including, for each affected spec:

* Updated running CR
* List of open issues to be addressed by company contributions
* (where applicable) CR rapporteur input with proposals for stage-3 issues (e.g., signalling details, parameter values/ranges) where company contributrions should be avoided

Including report of [Post123bis][407][POS] Rel-18 positioning capabilities (Xiaomi)

Incoming LSs with RAN2 in Cc:

[R2-2311707](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2311707_R1-2310478.doc) LS on PRS bandwidth aggregation (R1-2310478; contact: ZTE) RAN1 LS in Rel-18 NR\_pos\_enh2 To:RAN4 Cc:RAN2, RAN3

* Noted

[R2-2311734](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Docs\R2-2311734.zip) Reply LS on Authorization and Provisioning for Ranging/SL positioning service (R3-235933; contact: Xiaomi) RAN3 LS in Rel-18 Ranging\_SL, NR\_pos\_enh2 To:SA2 Cc:RAN2, CT4

* Noted

[R2-2311744](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2311744_R4-2317389.docx) Reply LS to RAN1 on SRS and PRS bandwidth aggregation for positioning (R4-2317389; contact: ZTE) RAN4 LS in Rel-18 NR\_pos\_enh2 To:RAN1 Cc:RAN2, RAN3

* Noted

Incoming LSs with “take into account” action only and no draft reply

[R2-2311745](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2311745_R4-2317390.docx) LS on report mapping for positioning measurements with PRS\_SRS bandwidth aggregation (R4-2317390; contact: Ericsson) RAN4 LS in Rel-18 NR\_pos\_enh2-Core To:RAN2, RAN3 Cc:RAN1

* Noted

[R2-2311746](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2311746_R4-2317391.docx) LS on SL positioning and carrier phase positioning measurements (R4-2317391; contact: CATT) RAN4 LS in Rel-18 NR\_pos\_enh2 To:RAN1, RAN2, RAN3

* Noted

Other incoming LSs and related documents

[R2-2311704](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2311704_R1-2310402.docx) Reply LS on SL positioning MAC agreements (R1-2310402; contact: Huawei) RAN1 LS in Rel-18 FS\_eLCS\_Ph3, NR\_pos\_enh2 To:RAN2 Cc:SA2

* Noted

[R2-2312265](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312265%20Draft%20reply%20LS%20on%20L1%20priority.doc) Draft reply LS on L1 priority Huawei, HiSilicon LS out Rel-18 NR\_pos\_enh2 To:RAN1

[R2-2311765](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2311765_S2-2311896.docx) Reply LS to Reply LS to SA2 on assistance information provided to UE (S2-2311896; contact: Xiaomi) SA2 LS in Rel-18 Ranging\_SL To:RAN2, CT1, CT4

* Noted

[R2-2313597](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Docs\R2-2313597.zip) Reply LS on security aspects for Ranging/Sidelink Positioning (S3-235078; contact: Xiaomi) SA3 LSin Rel-18 Ranging\_SL To:SA2, RAN2

* [AT124][401][POS] LS to SA3 on security for SL positioning (Xiaomi)

Scope: Draft an LS to SA3 in reply to R2-2313597 in accordance with our agreements.

Intended outcome: Approvable LS in R2-2313794

Deadline: Thursday 2023-11-16 1900 CST

Open issues list for WI

[R2-2313111](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2313111%20Open%20issue%20list%20for%20Rel-18%20positioning%20WI.docx) Open issues list on Rel-18 positioning WI CATT,Intel Corporation, Ericsson, Huawei, Qualcomm Incorporated, xiaomi, discussion Rel-18 NR\_pos\_enh2

* Noted

Running CRs: stage 2

[R2-2311860](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2311860%20Introduction%20of%20sidelink%20positioning%20in%2038300.docx) Introduction of sidelink positioning in 38300 vivo CR Rel-18 38.300 17.6.0 0722 - B FS\_NR\_pos\_enh2 Revised

* Revised in R2-2313543

[R2-2313543](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2313543%20Introduction%20of%20sidelink%20positioning%20in%2038300.docx) Introduction of sidelink positioning in 38300 vivo CR Rel-18 38.300 17.6.0 0722 1 B FS\_NR\_pos\_enh2 R2-2311860

[R2-2312787](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312787_(Summary%20of%20%5bPost123bis%5d%5b411%5d%5bPOS%5d).docx) Summary of [Post123bis][411][POS] Rel-18 positioning 38.305 CR (Qualcomm) Qualcomm Incorporated discussion

[R2-2312786](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312786_(Stage%202%20CR%20NR_pos_enh2)_v06.docx) Introduction of 'Expanded and improved NR positioning' Qualcomm Incorporated (Rapporteur) CR Rel-18 38.305 17.6.0 0150 - B NR\_pos\_enh2

Running CRs: MAC

[R2-2312259](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312259%20Summary%20of%20email%20discussion%20%5bPost123bis%5d%5b409%5d%5bPOS%5d%20Rel-18%20positioning%20MAC%20CRs%20(Huawei).DOCX) Summary of email discussion [Post123bis][409][POS] Rel-18 positioning MAC CRs (Huawei) Huawei, HiSilicon discussion Rel-18 NR\_pos\_enh2

[R2-2312258](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312258%20Summary%20of%20discussion%20on%20proposed%20WF%20for%20R18%20MAC%20spec%20drafting.docx) Summary of discussion on proposed WF for R18 MAC spec drafting Huawei, HiSilicon discussion Rel-18 NR\_pos\_enh2

Proposal1: Revisit the formula for determining CG occasion when the RRC configuration is fully determined

Proposal2: There can be zero or one SR configuration for SL-PRS resource request MAC CE

Proposal3: At most one PUCCH resource for SR is configured for SL-PRS resource request MAC CE.

Proposed4: Come back to this issue of determining the number of SL-PRS retransmission when the signaling details, i.e, the RRC configurations and L1 parameters are completed

Proposal6: At SCI reception, the source ID in SCI for SL-PRS dedicated resource pool when configured as 12 bit is the 12 LSB of the destination ID of the peer UE.

Proposal7: The number of bits for destination ID is 5 bits, the same as in legacy SL-BSR and the number of bits for priority is 3 bits.

Proposal8: eLCID is adopted for SL-PRS request MAC CE.

Proposed5: SL-PRS’s priority is on the same level as data from STCH and lower than SCI reporting MAC CE, Sidelink Inter-UE Coordination Request MAC CE and Sidelink Inter-UE Coordination Information MAC CE, Sidelink DRX Command MAC CE and data from SCCH.

Agreements:

Revisit the formula for determining CG occasion when the RRC configuration is fully determined

There can be zero or one SR configuration for SL-PRS resource request MAC CE

At most one PUCCH resource for SR is configured for SL-PRS resource request MAC CE.

Come back to this issue of determining the number of SL-PRS retransmission when the signaling details, i.e, the RRC configurations and L1 parameters are completed

At SCI reception, the source ID in SCI for SL-PRS dedicated resource pool when configured as 12 bit is the 12 LSB of the destination ID of the peer UE.

The number of bits for destination ID is 5 bits, the same as in legacy SL-BSR and the number of bits for priority is 3 bits.

eLCID is adopted for SL-PRS request MAC CE.

SL-PRS’s priority is on the same level as data from STCH and lower than SCI reporting MAC CE, Sidelink Inter-UE Coordination Request MAC CE and Sidelink Inter-UE Coordination Information MAC CE, Sidelink DRX Command MAC CE and data from SCCH.

[R2-2312260](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312260%20Draft%20running%20MAC%20CR%20for%20CA%20positioning.docx) Draft running MAC CR for CA positioning Huawei, HiSilicon draftCR Rel-18 38.321 17.6.0 NR\_pos\_enh2

* Noted

[R2-2312261](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312261%20Draft%20running%20MAC%20CR%20for%20carrier%20phase%20positioning.docx) Draft running MAC CR for carrier phase positioning Huawei, HiSilicon draftCR Rel-18 38.321 17.6.0 NR\_pos\_enh2

* Noted

[R2-2312262](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312262%20Draft%20running%20MAC%20CR%20for%20LPHAP.docx) Draft running MAC CR for LPHAP Huawei, HiSilicon draftCR Rel-18 38.321 17.6.0 NR\_pos\_enh2

* Noted

[R2-2312263](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312263%20Draft%20running%20MAC%20CR%20for%20REDCAP%20positioning.docx) Draft running MAC CR for REDCAP positioning Huawei, HiSilicon draftCR Rel-18 38.321 17.6.0 NR\_pos\_enh2

* Noted

[R2-2312264](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312264%20Draft%20running%20MAC%20CR%20for%20sidelink%20positioning.docx) Draft running MAC CR for sidelink positioning Huawei, HiSilicon draftCR Rel-18 38.321 17.6.0 NR\_pos\_enh2

* Noted

[R2-2312257](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312257%20Summary%20of%20open%20issue%20list%20for%20MAC%20issues%20for%20R18%20positioning.docx) Summary of open issue list for MAC issues for R18 positioning Huawei, HiSilicon discussion Rel-18 NR\_pos\_enh2

[R2-2312256](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312256%20Introduction%20of%20R18%20positioning%20to%20MAC%20spec.docx) Introduction of R18 positioning to MAC spec Huawei, HiSilicon CR Rel-18 38.321 17.6.0 1700 - B NR\_pos\_enh2

Running CRs: RRC

[R2-2313031](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2313031%20RRCSummaryReport.docx) [Post123bis][410][POS] Rel-18 positioning RRC CR (Ericsson) Ericsson report Rel-18

[R2-2312998](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312998%20RedCap.docx) RRC Positioning RedCap Changes Ericsson draftCR Rel-18 38.331 17.6.0 B NR\_pos\_enh2

* Noted

[R2-2312999](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312999%20SL.docx) RRC Positioning Sidelink Changes Ericsson draftCR Rel-18 38.331 17.6.0 B NR\_pos\_enh2

* Noted

[R2-2313000](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2313000%20BWA.docx) RRC Positioning Bandwidth Aggregation Changes Ericsson draftCR Rel-18 38.331 17.6.0 B NR\_pos\_enh2

* Noted

[R2-2313446](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2313446%20CPP.docx) Rapporteur CR for CPP Positioning RRC Changes Ericsson draftCR Rel-18 38.331 17.6.0 B NR\_pos\_enh2

* Noted

[R2-2312941](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312941%20MainLPHAP.docx) Introduction of NR Positioning Ericsson CR Rel-18 38.331 17.6.0 4454 - B NR\_pos\_enh2

Running CRs: LPP

[R2-2313112](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2313112%20Report%20of%20%5bPost123bis%5d%5b408%5d%5bPOS%5d%20Rel-18%20LPP%20running%20CRs%20(CATT).docx) Report of [Post123bis][408][POS] Rel-18 LPP running CRs (CATT) CATT discussion Rel-18 NR\_pos\_enh2

[R2-2313113](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2313113%20Introduction%20of%20RAT-dependent%20integrity.docx) Introduction of RAT-dependent integrity CATT draftCR Rel-18 37.355 17.6.0 NR\_pos\_enh2

* Noted

[R2-2313114](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2313114%20Introduction%20of%20bandwidth%20aggregation.docx) Introduction of bandwidth aggregation CATT draftCR Rel-18 37.355 17.6.0 NR\_pos\_enh2

* Noted

[R2-2313115](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2313115%20Introduction%20of%20Carrier%20Phase%20positioning.docx) Introduction of Carrier Phase Positioning CATT draftCR Rel-18 37.355 17.6.0 NR\_pos\_enh2

* Noted

[R2-2313116](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2313116%20Introduction%20of%20LPHAP%20and%20Redcap%20positioning.docx) Introduction of LPHAP and Redcap positioning CATT draftCR Rel-18 37.355 17.6.0 NR\_pos\_enh2

* Noted

[R2-2313117](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2313117%20Introduction%20of%20Expanded%20and%20improved%20NR%20positioning.docx) Introduction of Expanded and improved NR positioning CATT CR Rel-18 37.355 17.6.0 0481 - B NR\_pos\_enh2

CRs to specs without running CRs

[R2-2312267](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312267%20Introduction%20of%20R18%20positioning%20to%20IDLE%20mode%20procedure.docx) Introduction of R18 positioning to RRC\_IDLE mode procedure Huawei, HiSilicon CR Rel-18 38.304 17.6.0 0358 - B NR\_pos\_enh2

Discussion:

Intel think it is generally OK, but the ENs need to be removed; they think we can generally follow V2X practice.

Sony think some more work on the CR is needed for RRC\_INACTIVE.

CATT think we should check only the mandatory requirements, not further enhancements.

[R2-2312268](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312268%20Introduction%20of%20R18%20positioning%20to%20MR-DC.docx) Introduction of R18 positioning to MR-DC Huawei, HiSilicon CR Rel-18 37.340 17.6.0 0371 - B NR\_pos\_enh2

Discussion:

Lenovo think this is already clear since SL positioning requires discovery and communication.

Intel agree with Huawei and think it is clear that this cannot be done.

CATT are also fine with the change.

Ericsson have some sympathy with Lenovo’s comment and think we do not need a separate sentence. They also think we need to normalize on whether we say “SL positioning/ranging” or “NR sidelink positioning” or something else.

Agreement:

If the CR to TS 37.340 is agreed, the rapporteurs will add the TS to the WID for RAN#102.

* [AT124][402][POS] Rel-18 SL positioning CRs to 38.304 and 37.340 (Huawei)

Scope: Check the CRs in R2-2312267 and R2-2312268, collect detailed comments, and determine whether to have the CR to 37.340.

Intended outcome: Agreeable CR(s) and summary in R2-2313812

Deadline: Wednesday 2023-11-15 1900 CST

[R2-2313812](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2313812%20Rel-18%20SL%20positioning%20CRs%20to%2038.304%20and%2037.340%20(Huawei)_v10_Rapp.docx) Summary of [AT124][402][POS] Rel-18 SL positioning CRs to 38.304 and 37.340 (Huawei) Huawei, HiSilicon discussion NR\_pos\_enh2

Proposal1: The carrier supporting ranging/sidelink positioning should be prioritized if the UE is configured by the upper layer to perform sidelink positioning. (8/9)

Proposal2: For ranging/sidelink positioning, the UE may perform measurements on the non-serving frequencies that support ranging/sidelink positioning or the frequencies that may provide inter-carrier configurations for that frequencies for cell selection/reselection. (9/9)

Proposal3: For ranging/sidelink positioning, the UE considers itself to be out of coverage if on a certain frequency, it cannot find any cell that satisfy the S criterion. (9/9)

Proposal4: It needs to be captured in TS 37.340 that “Sidelink positioning cannot be configured in MR-DC in this release”. (9/9)

Discussion:

CATT think P1 is an enhancement, but they can follow the majority view.

Agreements:

The carrier supporting ranging/sidelink positioning should be prioritized if the UE is configured by the upper layer to perform sidelink positioning.

For ranging/sidelink positioning, the UE may perform measurements on the non-serving frequencies that support ranging/sidelink positioning or the frequencies that may provide inter-carrier configurations for that frequencies for cell selection/reselection.

For ranging/sidelink positioning, the UE considers itself to be out of coverage if on a certain frequency, it cannot find any cell that satisfy the S criterion.

It needs to be captured in TS 37.340 that “Sidelink positioning cannot be configured in MR-DC in this release”.

* [Post124][402][POS] Sidelink positioning CRs to 38.304 and 37.340 (Huawei)

Scope: Update and check the CRs in R2-2312267 and R2-2312268.

Intended outcome: Agreed CRs

Deadline: Short (for RP)

UE capabilities

[R2-2312762](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312762%20Open%20issue%20list%20for%20Rel-18%20positioning%20capability.doc) Open issue list for Rel-18 positioning capability Xiaomi discussion

NR\_pos\_enh2

Proposals for SL positioning:

Proposal 1 RAN2 to confirm the above understanding relating to the applicable positioning methods of each RAN1 feature.

Proposal 2 RAN2 to agree that positioning method specific capabilities are included in the positioning method specific capability IE.

Proposal 3 RAN2 to agree that periodical reporting capability is indicated per positioning mode per positioning method.

Proposal 4 RAN2 to agree that 10ms granularity response time is indicated per positioning mode per positioning method.

Proposal 9 Target UE needs to know the supported positioning methods of server UE.

Proposal 10 The supported positioning methods of server UE can be provided through metadata of discovery message.

Proposal 11 No capability signalling specific to server UE is needed.

Discussion:

Intel think P9 and P11 contradict each other. Xiaomi clarify that P10 unifies them. Intel think P10 belongs to the metadata discussion.

Lenovo wonder on P3/P4 why we need to report these per mode; they understand why it would be different per method. Xiaomi understand that this follows Uu positioning.

Agreements:

SL-PRS-related capabilities are grouped according to the table in R2-2312762.

Positioning method specific capabilities are included in the positioning method specific capability IE.

RAN2 to agree that periodical reporting capability is indicated per positioning mode per positioning method.

10ms granularity response time is indicated per positioning mode per positioning method.

Proposal 5 RAN2 agrees to have the following three SL positioning modes:

- UE assisted LMF based: an operation in which measurements are provided by the UE to the LMF to be used in the computation of a position estimate.

- UE assisted server UE based: an operation in which measurements are provided by the UE to the server UE to be used in the computation of a position estimate.

- UE based: an operation in which UE computes its own position.

Proposal 6 If scheduled location time is supported, corresponding capability is introduced and indicated per positioning mode per positioning method.

Proposal 7 Supported UE roles are included in the capability signalling.

Proposal 8 The UE roles in the capability signalling include anchor UE, anchor UE with location (i.e. located UE), server UE. UE can indicate the support of multiple UE roles.

Proposals for Uu positioning:

Proposal 12 Additional finer-grained capabilities for RAT dependent positioning integrity are not needed.

Proposal 13 Wait the progress on the alignment of PRS to fixed (e)DRX and then decides whether the corresponding capability is needed or not.

Proposal 14 The UE capability on supporting SRS with validity area request by RRC message is not needed.

[R2-2312761](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312761%20Report%20of%20%5bPost123bis%5d%5b407%5d%5bPOS%5d%20Rel-18%20positioning%20capabilities.docx) Report of [Post123bis][407][POS] Rel-18 positioning capabilities Xiaomi discussion

[R2-2312726](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312726%20306%20Running%20CR%20for%20SL%20positioning.doc) Running CR 38.306-SL positioning Xiaomi draftCR Rel-18 38.306 17.6.0 B

[R2-2312727](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312727%20TP%20for%20SLPP%20and%20RRC%20capability%20signalling%20for%20SL%20positioning.doc) TP for SLPP and RRC capability signalling for SL positioning Xiaomi discussion Rel-18

[R2-2312752](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312752%20Running%20CR%2038.306%20for%20R18%20Uu%20positioning.docx) Running CR 38.306 for R18 Uu positioning Xiaomi draftCR Rel-18 38.306 17.6.0 NR\_pos\_enh2

[R2-2312755](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312755%20TP%20for%20LPP%20capability%20signalling%20for%20Bandwidth%20Aggregation.doc) TP for LPP capability signalling for Bandwidth Aggregation Xiaomi discussion

[R2-2312756](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312756%20TP%20for%20LPP%20capability%20signalling%20for%20CPP.doc) TP for LPP capability signalling for CPP Xiaomi discussion

[R2-2312757](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312757%20TP%20for%20LPP%20capability%20signalling%20for%20LPHAP.doc) TP for LPP capability signalling for LPHAP Xiaomi discussion

[R2-2312758](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312758%20TP%20for%20LPP%20capability%20signalling%20for%20RAT-dependent%20positioning%20integrity.doc) TP for LPP capability signalling for RAT-dependent positioning integrity Xiaomi discussion

[R2-2312759](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312759%20TP%20for%20LPP%20capability%20signalling%20for%20RedCap.doc) TP for LPP capability signalling for RedCap Xiaomi discussion

[R2-2312760](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312760%20TP%20for%20RRC%20capability%20signalling%20for%20Uu%20positioning.doc) TP for RRC capability signalling for Uu positioning Xiaomi discussion

TS 38.355

[R2-2312020](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312020_%5bPost123bis%5d%5b412%5d%5bPOS%5d%20TS%2038.355%20(Intel)_v15_Summary%20Final.docx) Report of [Post123bis][412][POS] TS 38.355 (Intel) Intel Corporation discussion Rel-18 NR\_pos\_enh2

[R2-2312021](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Docs\R2-2312021.zip) TS 38.355 v1.2.0 Intel Corporation draft TS Rel-18 38.355 1.2.0 NR\_pos\_enh2

Discussion:

Lenovo think there are some issues with parameter values, but they can be resolved in the next version. Intel agree that there are some details to be resolved.

* Endorsed [to be progressed during this meeting]

[R2-2312022](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312022%20%20SLPP%20related%20open%20issues.docx) Further Considerations on SLPP related open issues Intel Corporation discussion Rel-18 NR\_pos\_enh2

[R2-2312023](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312023%20Draft%2038.355-130-rm.docx) Draft TS 38.355 v1.3.0 Intel Corporation discussion Rel-18 NR\_pos\_enh2

[R2-2312028](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312028%20Capture%20SLPP%20related%20RAN1%20parameters.docx) Capture SLPP related RAN1 parameters Intel Corporation discussion Rel-18 NR\_pos\_enh2

* [AT124][403][POS] Progress TS 38.355 (Intel)

Scope: F2F offline to discuss R2-2312020 and R2-2312028 and identified open issues on the SLPP specification. Additional open issues identified by companies can be discussed if time is available.

Intended outcome: Report to CB session in R2-2313795

Schedule: Wednesday 1100-1130 in Brk3

Deadline: Thursday 2023-11-16 1100 CST

[R2-2313795](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2313795_%5bAT124%5d%5b403%5d%5bPOS%5d%20Progress%20TS%2038.355%20(Intel)%20v01.docx) [AT124][403][POS] Progress TS 38.355 (Intel) Intel Corporation discussion Rel-18 NR\_pos\_enh2

Proposal 1: agree the following proposals from R2-2312020 Report of [Post123bis][412][POS]

- 1 Close the open issue 19, remove the “Editor's note FFS With regards to duplicate detection: the applicability of the 10min inactivity rule. With regards to retransmission: the applicability of the timeout period of 250ms”.

- 2 Close open issue 26 and 30, Reuse the Request/Provide Assistance Data messages for server to get anchor UE’s location, and the ENs for issue 26 and 30 can be removed.

- 3 Close the open issue 25 for stage 3, and remove the corresponding ENs.

- 4 Close open issue 41, sequenceID is included in Provide Assistance Data message.

- 5 Request of sequenceID is included in CommonSL-PRS-MethodsIEsRequestAssistanceData, the value should be boolean and optional.

Proposal 2: check the changes on latest RAN1 parameters in R2-2312023, Draft TS 38.355 v1.3.0 via postmeeting email discussion.

Proposal 3: close the open issue 5 and 6 on Session handling for LMF involved case:

- session ID is OPTIONAL in the SLPP message for the communication between target UE and the LMF;

- Session ID is assigned by target UE and used for communications between UEs.

Discussion:

vivo want to clarify that the second bullet is not about SLPP forwarding. Intel point out that we already agreed to have no forwarding in SLPP specification.

vivo understand the session ID may be assigned by the LMF.

ZTE think we only agreed that the LMF and AMF have the correlation ID and routing ID, so they think the second bullet is correct as it is. Intel indicate that this was discussed offline and we should not repeat.

Nokia are not sure why the session ID is OPTIONAL. Ericsson think there could be scenarios where the LMF does not need the session ID, but others where it would be needed.

Huawei think the UE-UE and UE-LMF cases should match, since they use the same messages, and the session ID is clearly needed for UE-UE but may not be needed UE-LMF, so OPTIONAL makes sense.

Intel note that the proposal is aligned with the current draft.

CEWiT wonder who will assign the session ID in the cases where it is optional. Intel understand that the meaning of the second bullet is to align network-involved operation with UE-only operation, and it should still be assigned by target UE.

ZTE wonder if we should say in the field description that the session ID is ignored in the LMF-involved case. Intel think this may be necessary, but some companies want to check if there is a use case with the LMF; it can be sorted out in maintenance. OPPO think we can further check.

Proposal 4: close the open issue 9, endSessionFlag is not introduced in Rel-18

Proposal 5: close the open issue 24, 28, 31 on UE role. RAN2 will not capture the description of UE role for procedures.

Proposal 6: close the open issue 31 on Need code, delta signalling is not supported and Need code is not supported unless companies identify the real need.

Discussion:

Huawei think the behaviour between UEs still needs to be specified, so we may need need codes. They understand we would default to Need R behaviour. Intel have the same understanding; this requires full configuration. Lenovo agree.

Proposal 7: open issue 50 on relative location/velocity can be checked in maintenance phase.

Proposal 8: close the open issue 52, application layer ID is used in the SLPP specification.

Proposal 9: close the open issue 53 on QoS for AoA, capture the TP from R2-2312724 in SLPP specification.

Proposal 10: close the open issue 49, scheduled location between UE and the LMF is supported in the SLPP specification. E-CID like trigger event is not supported in the SLPP specification.

Proposal 11: proposal 2 from R2-2312127 is not pursued;

Proposal 12: Update the TS 38.355 based on the proposal 3 from R2-2312127 on the periodical reporting;

Proposal 13: the proposal 4 from R2-2312127 to change the max value for SL-RTT-AdditionalPathList and SL-TDOA-AdditionalPathList to 8 has been covered by latest RAN1 parameters “the maximum number of additional paths for SL-RSTD, SL-RTOA and SL Rx – Tx time difference to be equal to 8. The maximum number of additional paths for SL-AoA is equal to 2”, Will update the TS 38.355 accordingly;

Note: RAN1 has agreed

Define the maximum number of additional paths for SL-RSTD, SL-RTOA and SL Rx – Tx time difference to be equal to 8. The maximum number of additional paths for SL-AoA is equal to 2.

Proposal 14: Update the TS 38.355 based on the proposal 10 from R2-2312807

- Clarify that RangeResult field under the LocationCoordinates IE of the CommonIEsProvideLocationInformation IE is in metric units of meters and update the value range to INTEGER (0..999).

- Clarify that the AzimuthResult and ElevationResult field under the LocationCoordinates IE of the CommonIEsProvideLocationInformation IE is in metric units of degrees and update the ElevationResult value rage to INTEGER (0..89).

Proposal 15: proposal 2 from R2-2313329 on the TP for section 4.2 of SLPP is not pursued;

Proposal 16: proposal 3 from R2-2312724 on the TP Reference direction can be discussed in maintenance phase;

Proposal 17: RAN2 confirm that the support of SLPP is fully optional for the UE, i.e. there is no prerequisite for a SL positioning capable UE to support LPP. No specification impact;

Proposal 18: RAN2 confirm that adopt the LPP approach (i.e. left to UE implementation) for SLPP on the support of multiple parallel SL positioning sessions. No specification impact.

Proposal 19: RAN2 confirm that Separate LPP (for Uu positioning) and SLPP(for SL positioning) is used as the baseline for hybrid positioning..

Proposal 20: proposal 6 from R2-2313329 on sessionType is not pursued;

Proposal 21: proposal 7 from R2-2313329 on common time reference has been covered by RAN1 new parameters sl-Timestamp, tx-Time-Info. Will update the TS 38.355 accordingly.

Proposal 22: proposal 5 and 6 from R2-2312254 on SA2 issues are not pursued; Companies can discuss this in SA2 directly.

Agreements:

Agree the following proposals from R2-2312020 Report of [Post123bis][412][POS]

- 1 Close the open issue 19, remove the “Editor's note FFS With regards to duplicate detection: the applicability of the 10min inactivity rule. With regards to retransmission: the applicability of the timeout period of 250ms”.

- 2 Close open issue 26 and 30, Reuse the Request/Provide Assistance Data messages for server to get anchor UE’s location, and the ENs for issue 26 and 30 can be removed.

- 3 Close the open issue 25 for stage 3, and remove the corresponding ENs.

- 4 Close open issue 41, sequenceID is included in Provide Assistance Data message.

- 5 Request of sequenceID is included in CommonSL-PRS-MethodsIEsRequestAssistanceData, the value should be boolean and optional.

Check the changes on latest RAN1 parameters in R2-2312023, Draft TS 38.355 v1.3.0 via postmeeting email discussion.

Close the open issue 5 and 6 on Session handling for LMF involved case:

- session ID is OPTIONAL in the SLPP message for the communication between target UE and the LMF;

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Proposal 5: close the open issue 24, 28, 31 on UE role. RAN2 will not capture the description of UE role for procedures.

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Proposal 8: close the open issue 52, application layer ID is used in the SLPP specification.

Proposal 9: close the open issue 53 on QoS for AoA, capture the TP from R2-2312724 in SLPP specification.

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Proposal 12: Update the TS 38.355 based on the proposal 3 from R2-2312127 on the periodical reporting;

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Note: RAN1 has agreed

Define the maximum number of additional paths for SL-RSTD, SL-RTOA and SL Rx – Tx time difference to be equal to 8. The maximum number of additional paths for SL-AoA is equal to 2.

Proposal 14: Update the TS 38.355 based on the proposal 10 from R2-2312807

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Proposal 18: RAN2 confirm that adopt the LPP approach (i.e. left to UE implementation) for SLPP on the support of multiple parallel SL positioning sessions. No specification impact.

Proposal 19: RAN2 confirm that Separate LPP (for Uu positioning) and SLPP(for SL positioning) is used as the baseline for hybrid positioning..

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Proposal 21: proposal 7 from R2-2313329 on common time reference has been covered by RAN1 new parameters sl-Timestamp, tx-Time-Info. Will update the TS 38.355 accordingly.

Proposal 22: proposal 5 and 6 from R2-2312254 on SA2 issues are not pursued; Companies can discuss this in SA2 directly.

Draft outgoing LS

[R2-2313118](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2313118%20Draft%20LS%20to%20SA2%20on%20introduction%20of%20RAT-Dependent%20integrity.docx) Draft LS to SA2 on introduction of RAT-Dependent integrity CATT LS out Rel-18 NR\_pos\_enh2 To:SA2

Discussion:

Ericsson think there are already related contributions in SA2, but they think an LS is needed and should include CT4 for the LCS client signalling.

Qualcomm do not see a need for an LS, but they think if it is to be sent, it should be precise, e.g., about what positioning methods are involved. Ericsson note that integrity is RAN2-led and think an LS detailing the agreements would be good.

CATT agree CT4 can be included.

vivo think since we agreed to reuse the legacy KPIs, there may not be impacts on CT4. They think CT4 should not be in To: but maybe Cc:. Qualcomm agree; they think the signalling is not dependent on positioning methods, and they see only that SA2 need to update a NOTE.

Ericsson are concerned about the transfer of the positioning result back to the LCS client. Qualcomm think this is a CT4 issue, not RAN2.

* [AT124][404][POS] LS to SA2 on RAT-dependent integrity (CATT)

Scope: Progress the LS in R2-2313118, aligning with agreements of this meeting if necessary and taking into account company comments. CT4 is in Cc: and expected action for SA2 is “take into account”.

Intended outcome: Approvable LS (without CB if possible) in R2-2313796

Deadline: Wednesday 2023-11-15 1900 CST

[R2-2313796](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2313796%20LS%20on%20introduction%20of%20RAT-Dependent%20integrity.docx) LS on introduction of RAT-Dependent integrity CATT LS out Rel-18 NR\_pos\_enh2 To:SA2 Cc:CT4, RAN1

* Approved (email discussion [AT124][404])

Incoming LSs during meeting (to be treated in Thursday CB session)

[R2-2313895](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2313895_R1-2312393.docx)       Reply LS on CPP (R1-2312393; contact: CATT) RAN1 LS in Rel-18 NR\_pos\_enh2 To:RAN2 Cc:RAN4, RAN3, SA2

* Noted

[R2-2313896](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2313896_R1-2312395.doc)       Reply LS on SRS and PRS bandwidth aggregation for positioning (R1-2312395; contact: ZTE) RAN1 LS in Rel-18 NR\_pos\_enh2 To:RAN4 Cc:RAN2, RAN3

* Noted

[R2-2313897](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2313897_R1-2312434.docx)       Reply LS on request for clarifications on RedCap positioning, carrier phase positioning, and bandwidth aggregation for positioning (R1- 2312434; contact: Nokia) RAN1 LS in Rel-18 NR\_pos\_enh2 To:RAN2 Cc:RAN3, RAN4

* Noted

Discussion:

InterDigital think the point with no consensus in RAN1 under Q8 is not critical and RAN1 are just giving a clarification. Nokia understand that we then just need to incorporate the answers into the running CRs.

CATT note that on Q8, RAN1 indicated handling of PRU measurements that is not in line with the latest LPP CR; it will be updated to match the RAN1 guidance.

### 7.2.2 Sidelink positioning

Positioning architecture and unicast signalling procedures (e.g. configuration, measurement reporting, etc) to enable session-based sidelink positioning for a single target UE. Including measurements to enable RTT-based positioning, SL-AoA, and SL-TDOA; signalling and associated UE behaviour for support of unicast, groupcast (not including many-to-one) and broadcast of SL-PRS transmissions; reporting signalling and procedures to facilitate support of SL positioning between UEs and between UEs and LMF (the latter for in-coverage scenarios only and including joint PC5-Uu scenarios, and with the assumption that all UEs are served by the same LMF); and signalling to NG-RAN for SL positioning and service authorization as needed. No work on procedures for synchronization of the anchor UEs for SL-TDOA.

Companies are requested not to contribute documents on SLPP forwarding or discovery metafield contents. The corresponding email discussions will be treated under this agenda item.

Including report of [Post123bis][404][POS] SLPP forwarding (Intel)

Including report of [Post123bis][405][POS] Sidelink positioning discovery metafield (vivo)

Email discussion reports

[R2-2312019](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312019.docx) Report of [Post123bis][404][POS] SLPP forwarding (Intel) Intel Corporation discussion Rel-18 NR\_pos\_enh2

Proposal: SLPP forwarding functionality shall not be supported for Rel-18 and RAN2 understands that forwarding (if needed) will be handled by CT1 according to SA2 WF. RAN2 also agrees to provide support to other groups on this aspect as needed.

Discussion:

vivo think the “shall not be supported” part is confusing an dshould be clearly scoped to RAN2. Chair suggests “is not supported in RAN2”; Intel suggest “in SLPP specification”.

ZTE agree with Intel’s interpretation. They also understand that SA2 have agreed on forwarding and “(if needed)” could be deleted. Intel think SA2 still need to confirm this decision and it is not RAN2 business.

Xiaomi think we should clarify that it is for both network-involved and UE-only cases.

Apple think we should just agree that we do not support it, and assume SA2/CT1 will figure out what is needed from them.

Agreement:

SLPP forwarding functionality is not specified in SLPP spec. RAN2 will provide support to other groups on this aspect as needed.

[R2-2311863](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2311863%20Report%20of%20%5bPost123bis%5d%5b405%5d%5bPOS%5d%20Sidelink%20positioning%20discovery%20metafield%20(vivo).docx) Report of [Post123bis][405][POS] Sidelink positioning discovery metafield (vivo) vivo report Rel-18 FS\_NR\_pos\_enh2

Proposal 1 (13/16): RAN2 to specify the RSPP metafield in SLPP specification as a separate PDU/ASN.1 module.

Proposal 2 (13/15): Introduce an unified RSPP metafield structure for all the discovery messages.

Proposal 3: Ask SA2 whether the metafield type (i.e., announced, required, satisfied) can be implicitly indicated by the discovery message that carries the metafield. If not feasible, introduce an explicit indication of the metafield type.

Proposal 4 (12/16): To distinguish the Reference UE/Anchor UE from Located UE, the UE announced as anchor UE in the RSPP metafield should also indicate the availability of known location (1-bit indication).

Proposal 5 (14/16): Multiple UE roles can be indicated in the RSPP metafield.

Proposal 6 (12/18): No need to explicitly indicate the SLPP support in the RSPP metafiled.

Proposal 7 (11/18): Include the Sidelink positioning methods (i.e., SL-RTT, SL-AoA, SL-TDOA, SL-TOA) of anchor UE in the RSPP metafiled.

Proposal 8 (9/17): No need to include Sidelink positioning methods of server UE in the RSPP metafiled. Can revisit this if server UE will expose its capability to other UEs via SLPP ProvideCapabilities message.

Proposal 9: During discovery, anchor UE should indicate whether it is in the coverage of a network supporting Ranging/SL Positioning. Ask SA2 whether the indication is inside or outside the RSPP metafield.

Proposal 10 (17/17): No need to include the serving PLMN in the RSPP metafiled.

Proposal 11 (10/17): No need to include the mobility status (Stationary or movable) of anchor UE in the RSPP metafiled. Can revisit this if SA2 decides it is needed.

Proposal 12: Reply LS to SA2 on the agreements and issues related to the RSPP metafield.

Discussion:

Lenovo think there was some doubt about which spec should capture the metafield in P1. They understand that TS 24.514 captures CT1 details for the discovery procedures and messages, and they think the content of the metafield could be captured there with a TP provided by RAN2.

Apple have a similar understanding that RAN2 were tasked to agree on the content but not actually specify it.

Intel understand that Lenovo are providing something like the RAN1 parameter list style. They have no strong view on which way we go.

Huawei tend to think RAN2 should specify the metafield to have it transparent to CT1/SA2 and capture only the RAN2-relevant parameters, so they agree with the proposal.

Xiaomi think we should specify in the RAN2 spec and avoid a lot of interaction with CT1.

Nokia agree that this is a RAN2 job given to us from SA2, and we do not have time to offload it to another group.

Qualcomm think this is not a PDU but a basic production IE; we could define an IE in SLPP that will be encoded in a bit string format by CT1.

Intel think the simple way is to define an SLPP message and let CT1 embed it in the discovery message.

Sony think the question is whether to define the format in ASN.1 in SLPP or let CT1 define it based on our parameters.

Apple suggest that we take the content discussion first; if the metafield is small, the ping-pong will be minimal.

Intel think if we use the PDU approach, it becomes difficult for the upper layer to generate the discovery message by itself, so they tend to agree with Lenovo’s proposal.

vivo think we cannot decouple the layers because the filtering is done by the SLPP layer after it gets the metafield information, so they do not see a problem with specifying it in SLPP.

Apple suggest we specify it in SLPP but not in ASN.1.

Ericsson would prefer it to be done by CT1.

Nokia think if we want CT1 to do the definition, we need to give them a detailed list of parameters, and the delta between that and defining it ourselves is small.

OPPO think normally we do not send such a request directly to CT1 but go via SA2., which would consume more time. So they think it is better to specify it as an SLPP IE.

ZTE think we should let CT1 do the formatting; if we design a separate IE in SLPP, they see it as weird that it would be defined but not used. However, they agree with Nokia that we should give a detailed list of parameters.

OPPO think the target UE needs to select the server UE and should know about the supported positioning methods. Ericsson think it is not necessary for this release and we should minimise spec impact.

Agreements:

To distinguish the Reference UE/Anchor UE from Located UE, the UE announced as anchor UE in the RSPP metafield should also indicate the availability of known location (1-bit indication).

Multiple UE roles can be indicated in the RSPP metafield.

To be discussed offline whether this information is captured as an SLPP IE, a parameter list in SLPP spec, or a parameter list sent to SA2/CT1 in an LS.

* [AT124][405][POS] Format of SL positioning discovery metafield (vivo)

Scope: F2F offline to discuss whether the discovery metafield is captured as an SLPP IE, a parameter list in SLPP spec, or a parameter list sent to SA2/CT1 in an LS.

Intended outcome: Report to CB session in R2-2313792

Schedule: Wednesday 1130-1200 in Brk3

Deadline: Wednesday 2023-11-15 1900 CST

[R2-2313792](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2313792%20Report%20of%20%5bAT124%5d%5b405%5d%5bPOS%5d%20Format%20of%20metafield%20(vivo)_v1.docx) Report of [AT124][405][POS] Format of SL positioning discovery metafield (vivo) vivo discussion Rel-18 NR\_pos\_enh2

Proposal 1: Specify the RSPP metadata in SLPP specification as an SLPP IE/separate module (in a separate section and is not expected to be included in any SLPP message).

Proposal 2: LS to SA2 on the agreements on the RSPP metadata.

Proposal 3: No need to include the following parameters in RSPP metadata:

- metadata type (i.e., announced, required, satisfied);

- SLPP support;

- serving PLMN;

- positioning methods of anchor UE.

InterDigital note that the serving PLMN is already in the SA2 specification. They wonder if SA2 will provide additional contents for the metafield. Chair understood that SA2 asked RAN2 to define the metafield fully; Intel have the same understanding, and they assume that if SA2 find a need for something they will put it outside the metafield container.

ZTE think the LS should include an answer to the question of whether the coverage status should be included in the metafield or somewhere else; they think SA2 need RAN2 input on this. Intel note that SA2 did not ask us this so far.

Huawei agree that serving PLMN is agreed in SA2, but outside the metafield container. They agree with Intel on ZTE’s comment.

Xiaomi agree that SA2 are discussing this subject, but they think there it is mainly about NAS connection or not, not about suitable-cell coverage.

Ericsson think if we send the LS with the parameters we have agreed, SA2 will know that there is no consensus on coverage. Xiaomi think we should consider coverage from AS pov, whereas SA2 are looking at it in NAS.

Intel think there was no consensus on this point. vivo agree with Intel and think we should only include the agreed parameters.

Lenovo wonder about the positioning methods for the server UE. Intel think this was not widely supported and we might be able to agree not to include it.

CEWiT think we should keep to what was agreed in the offline. They think there is a use case for the positioning methods of the server UE, dependent on other WGs.

Lenovo understand that the server UE somewhat mimics the LMF, and at discovery level it should not advertise its supported positioning methods.

OPPO agree with Lenovo and think the server UE may not support all positioning methods.

Xiaomi think the cost will be important for the server UE, and some servers may support only certain positioning methods.

Agreements:

Specify the RSPP metadata in SLPP specification as an SLPP IE/separate module (in a separate section and is not expected to be included in any SLPP message).

LS to SA2 on the agreements on the RSPP metadata.

No need to include the following parameters in RSPP metadata:

- metadata type (i.e., announced, required, satisfied);

- SLPP support;

- serving PLMN;

- positioning methods of anchor UE.

* [Post124][401][POS] LS to SA2 on sidelink positioning discovery metafield (vivo)

Scope: Draft an LS to SA2, Cc: CT1, reporting on the agreements for discovery metafield. Expected action is “take into account”.

Intended outcome: Approved LS

Deadline: Short (not for RP)

* [AT124][406][POS] SL positioning MAC functional issues (Huawei)

Scope: F2F offline to narrow down MAC functional issues and establish consensus where possible.

Intended outcome: Report to CB session in R2-2313599

Schedule: Wednesday 2023-11-15 1030-1055 in Brk1 (during coffee break)

Deadline: Wednesday 2023-11-15 1900 CST

[R2-2313599](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2313599%20Offline%20discussion%20for%20the%20MAC%20layer%20for%20Sidelink%20positioning.docx) Offline discussion on the MAC layer for Sidelink positioning Huawei, HiSilicon discussion Rel-18 NR\_pos\_enh2

Potentially easy to agree

Proposal1a: Uplink transmission can be considered as prioritized when uplink cannot be transmitted together with sidelink and none of the V2X sidelink communications or NR sidelink communications or sidelink PRS transmissions are prioritized.

Proposal1b: The prioritization between SR triggered by UL-SCH and SL-PRS shall follow the same principle as that between UL-SCH and SL-SCH, i.e. based on configured UL/SL prioritization thresholds.

Proposal1c: The prioritization between SR triggered by SL-SCH and SL-PRS shall be based on direct comparison between the SL priority for SL-PRS and the SL logical channel that triggered the SR.

Proposal1d: Reuse the legacy threshold for SL communications for SL-PRS prioritization.

Proposal2a: SL-PRS resource request MAC CE

 May be cancelled when SL grant can accommodate all the pending SL-PRS transmission.

 Shall be cancelled when a MAC PDU is transmitted and this MAC PDU contains SL-PRS resource request MAC CE that indicates all the pending SL-PRS to be transmitted since the last event the MAC CE is triggered.

Proposal2b: Triggered SR shall be cancelled

 when SL grant can accommodate all the pending SL-PRS transmission.

 when a MAC PDU is transmitted and this MAC PDU contains SL-PRS resource request MAC CE that indicates all the pending SL-PRS to be transmitted since the last event the MAC CE is triggered.

Proposal6: Reuse the legacy counter mechanism for SL-PRS transmission, i.e., the counter is maintained per SL process.

Proposal8: [modified] SL-PRS resource request MAC CE includes a list of (destination, priority).

Discussion:

ZTE wonder on P6 whether the counter mechanism also applies to dedicated pool (with no SL process). Huawei indicate that it is applicable to both dedicated and shared pools, and they think this is in line with the current model in the MAC spec. ZTE think it is a terminology issue, and they suggest clarifying in the proposal.

Intel agree with Huawei’s comment.

vivo indicate that RAN1 have agreed that bandwidth is needed also in P8. Huawei understand that the proposal is not restrictive and if RAN1 come with another request it can be added.

Agreeable under a certain condition/working assumption

Proposal4:[modified] Send a LS to RAN1 for asking the following questions if there is no RAN1 progress

 Whether retransmission is supported on dedicated resource pool

Discussion:

Huawei think it is OK to send the LS, since RAN1 have not agreed yet; they think the issue is important. Lenovo understand that there is an agreement to have retransmission.

Huawei think we can work without an LS if companies confirm that there is a RAN1 agreement, but they think a general LS to RAN1 on RAN2 agreements would be needed.

Huawei wonder about retransmission on shared pool. ZTE understand that we intend to ask RAN1 about this. Intel agree we could ask; they understand that there is not consensus in RAN1 on this.

Huawei think the question and an update on agreements could be added to the LS on priority.

InterDigital wonder if this is about ACK/NACK-based retransmission or blind. OPPO think we could ask RAN1 about this as well. Huawei understand this too can be considered by RAN1. Intel agree with Huawei.

RAN1 colleagues indicate that there are related agreements from RAN1; companies can coordinate internally.

Proposal5: When there are both SL-PRS and SL-SCH data pending for transmission at resource selection, the resource selection should be within the smaller one of the SL-PRS delay budget of the pending SL-PRSs and PDB of the logical channels.

Discussion:

InterDigital understand if the SL-PRS and data are both to be transmitted, the smaller priority value (higher priority) is selected.

Need further discussion in RAN2

Proposal3: RAN2 to discuss when triggered by the peer UE with lower layer signalling, how to determine the priority and reservation period

1/ By implementation [ZTE, Ericsson, Intel, OPPO, SS, LG]

2/ By the priority and reservation periodic within the SCI from the peer UE [HW, IDC, VIVO]

3/ By the UE’s own higher layer [ZTE, E//, OPPO, SS, Intel, LG]

Discussion:

ZTE think the word “implementation” has been confusing, and they think option 3 is preferable and in line with what we agreed for priority determination by the Tx UE.

InterDigital think the higher layer will use information from the peer UE side.

Huawei think “by implementation” excludes the higher layer, so the three options are really mutually exclusive.

Intel think the problem comes from RAN1 indicating that UE upper layer will provide the priority to lower layers; RAN1 agreed not to support lower layer signalling for the indication, so they understand that option 2 is excluded.

InterDigital have a concern with option 3: How will the upper layer decide the priority in the absence of information from the peer UE. Huawei agree.

ZTE understand all UEs in the session need the priority information, so they think InterDigital’s scenario does not make sense.

Huawei think InterDigital’s comment makes sense; they do not see how the UE can get the priority from the higher layer. They do not understand that RAN1 excluded lower-layer signalling.

Intel understand RAN1 indicated that it is feasible to use the UE’s higher layer. Huawei understand this is about triggering from the higher layer, not from the peer UE’s lower-layer signalling.

Ericsson think we can come back to this and be contribution-driven.,

Lenovo wonder if the derivation of the priority is open is still open based on positioning QoS. Huawei think this is more of an SA2 issue.

Agreements:

Uplink transmission can be considered as prioritized when uplink cannot be transmitted together with sidelink and none of the V2X sidelink communications or NR sidelink communications or sidelink PRS transmissions are prioritized.

The prioritization between SR triggered by UL-SCH and SL-PRS shall follow the same principle as that between UL-SCH and SL-SCH, i.e. based on configured UL/SL prioritization thresholds.

The prioritization between SR triggered by SL-SCH and SL-PRS shall be based on direct comparison between the SL priority for SL-PRS and the SL logical channel that triggered the SR.

Reuse the legacy threshold for SL communications for SL-PRS prioritization.

SL-PRS resource request MAC CE:

 May be cancelled when SL grant can accommodate all the pending SL-PRS transmission.

 Shall be cancelled when a MAC PDU is transmitted and this MAC PDU contains SL-PRS resource request MAC CE that indicates all the pending SL-PRS to be transmitted since the last event the MAC CE is triggered.

Triggered SR shall be cancelled

 when SL grant can accommodate all the pending SL-PRS transmission.

 when a MAC PDU is transmitted and this MAC PDU contains SL-PRS resource request MAC CE that indicates all the pending SL-PRS to be transmitted since the last event the MAC CE is triggered.

Reuse the legacy counter mechanism for SL-PRS transmission, i.e., the counter is maintained per SL process. This applies for both shared and dedicated pool.

SL-PRS resource request MAC CE includes at least a list of (destination, priority).

Implement support for retransmission on dedicated resource pool.

When there are both SL-PRS and SL-SCH data pending for transmission at resource selection, the resource selection should be within the smaller one of the SL-PRS delay budget of the pending SL-PRSs and PDB of the logical channels.

P17-P31 (largely RRC issues)

[R2-2312255](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312255%20Remaining%20issues%20in%20the%20lower%20layer%20for%20Sidelink%20positioning.docx) Remaining issue for the lower layer for sidelink positioning Huawei, HiSilicon discussion Rel-18 NR\_pos\_enh2

Conditions for establishing RRC Connection/Resumption for NR SL-PRS transmission

Proposal17: UE should perform connection setup/resume request with the following conditions:

(a) SL-PRS transmission is triggered; and

(b) the carrier for SL-PRS transmission is included in the frequency list in the system information; and

(c) the system information does not have resource pool configuration for Scheme2 selection.

Sidelink UE information NR

Proposal18: Transmission of SidelinkUEinformaitonNR for SL-PRS is needed for the UE to let gNB know the UE’s interest in SL-PRS transmission or the UE’s no longer interested.

Discussion:

Lenovo wonder if we will reuse the legacy content. Huawei understand that something would be needed to indicate that the interest is in SL-PRS.

Ericsson think we agreed that whatever we have for communication we will reuse for SL-PRS, and they think this covers a lot of these proposals.

Lenovo wonder about the QoS in the indication; would it be transport QoS or positioning QoS? Huawei think this is a reasonable question but it can be worked out in maintenance.

InterDigital wonder if we would combine indications in a single SUI message if the UE is interested in both SL-PRS and communication.

CG configuration request

Proposal19: The UE uses UAI to request CG configuration when request is received from lower layer for periodic SL-PRS transmissions.

Discussion:

Huawei note that we already agreed to use RRC, and they think this may be possible to do with limited spec impact in the existing message.

Lenovo think we should check the SL-PRS-specific configurations in case there are lower-layer parameters that need to be indicated. Ericsson think there are RAN1 agreements on the parameters.

Samsung are OK with the proposal but want to clarify what “received from lower layer” means, since the service comes from upper layer.

Huawei indicate the current modelling is that MAC layer checks whether the triggered SL-PRS is periodic or aperiodic, and if periodic, MAC triggers RRC to send the message.

Condition for UE performs NR sidelink positioning operation

Proposal20: UE is allowed for performing SL-PRS transmission when the following conditions are satisfied:

 The selected cell is suitable or in limited service state and it supports SL-PRS transmission; or

 The selected cell is suitable or in limited service state and UE is out of coverage for the cell supporting SL-PRS transmission; or

 The UE is in RRC\_IDLE

Discussion:

Huawei indicate “The UE is in RRC\_IDLE” should be “The UE is not served by any cell”. The intention is to follow legacy.

Ericsson agree we should follow legacy.

ZTE wonder if we need an explicit distinction for SL-PRS.

Proposal21: If it is agreed that the UE can perform SL-PRS transmission when the selected cell is in limited service state, inform SA2 of RAN2’s agreement.

Synchronization issues

Proposal22: Confirm that for the selection between SFN/DFN for T0:

• When the UE selects a cell as the synchronization reference source, SFN0/SFN is used for SL-PRS based RTOA.

• Otherwise, DFN/DFN0 is used for the definition of the SL-PRS based RTOA.

Resource allocation scheme selection

Proposal23: If the UE is in RRC\_CONNECTED, when the UE is configured with SL-PRS resource allocation scheme 1 configurations, SL-PRS transmission is not supported when:

 T310 or T311 is running (RLF is triggered)

 T301 is running (RRC re-establishment has been triggered)

 T304 is running (HO has been triggered)

Otherwise, SL-PRS resource allocation Scheme 1 is selected.

Discussion:

InterDigital think the proposal is wrong in some details. They also wonder if use of the exceptional pool is allowed for SL-PRS.

Huawei think there is no requirement for the exceptional pool in SL-PRS transmission, but they think it can be discussed later.

Proposal24: If the UE is in RRC\_CONNECTED, when the UE is configured with SL-PRS resource allocation scheme 2 configurations, SL-PRS resource allocation scheme 2 is selected when system information supports SL-PRS resource allocation Scheme 2 for the current cell.

Proposal25: if the UE is not in RRC\_CONNECTED and the current cell support SL-PRS transmission, SL-PRS resource allocation Scheme2 is selected

Proposal26: if the UE is not in RRC\_CONNECTED and the current cell does not support SL-PRS transmission, SL-PRS resource allocation scheme 2 based on pre-configuration is selected.

Cell selection/reselection

Proposal27: If the UE is configured by upper layer to perform SL-PRS transmission, the carrier providing support for SL-PRS transmission and NR sidelink communications may be prioritized.

Proposal28: Support SL-PRS transmission in limited service state.

Proposal29: For SL-PRS transmission, the UE may perform measurements on the non-serving frequencies that support ranging/sidelink positioning.

Proposal30: For SL-PRS transmission, the UE considers itself to be out of coverage if on a certain frequency, it cannot find any cell that satisfy the S criterion.

Proposal31: For cell-reselection triggered for SL-PRS transmission, UE shall perform the evaluation as follows: The UE shall use cell selection/reselection parameters broadcast by the concerned cell (i.e. selected cell for the sidelink operation) for the evaluation.

Discussion:

CATT think P27 may be a problem because of the differences between SL-PRS transmission and sidelink communication, and they see no requirement for continuous sidelink positioning during cell reselection. Huawei think if there is a suitable cell, the UE is not out of coverage and the scenarios about which CATT are concerned do not apply.

Intel wonder about the scenario where the UE supports SL-PRS transmission but not SL communication; this does not seem realistic. Huawei agree with Intel and think SL communication is a prerequisite for SL positioning.

Huawei think SL communication can be removed from P27 and left to network implementation. They also note that the proposal is covered in offline.

CATT clarify that they are thinking of situations where the LMF is the server, hence in coverage, and there may be no sidelink communication. But they are OK to discuss by email.

Agreements:

UE should perform connection setup/resume request with the following conditions:

(a) SL-PRS transmission is triggered; and

(b) the carrier for SL-PRS transmission is included in the frequency list in the system information; and

(c) the system information does not have resource pool configuration for Scheme2 selection.

Transmission of SidelinkUEInformationNR for SL-PRS is needed for the UE to let gNB know the UE’s interest in SL-PRS transmission or the UE’s no longer interested.

The UE uses UAI to request CG configuration when periodic SL-PRS transmissions are needed.

Conditions for UE to perform sidelink positioning, including SL-PRS transmission, are aligned with legacy sidelink communication conditions.

If the UE is in RRC\_CONNECTED, when the UE is configured with SL-PRS resource allocation scheme 1 or scheme 2 configurations, conditions for transmitting SL-PRS follow the corresponding legacy sidelink communication conditions.

For cell-reselection triggered for SL-PRS transmission, UE follows legacy behaviour for sidelink communication.

Ericsson think we should decide whether to use SIB12 or a new SIB. They indicate that the current running CR uses SIB12.

Qualcomm think since we introduced a new IE for dedicated signalling, the baseline should be a new SIB for SL-PRS. They also think there are some parameters in SIB12 that are not applicable to SL-PRS. Ericsson agree this is a valid point, but they think the discovery configuration may have to be copied from SIB12.

vivo wonder if both the shared and dedicated resource pools should be included in the new SIB. Huawei think it is a reasonable question, but first we need to consider the reason to introduce a new SIB; in their view it is to be friendly to legacy UEs that have to receive SIB12 but do not need to receive positioning information.

Huawei think we do not need to include everything in the new SIB, so, e.g., discovery parameters may not need to be duplicated.

InterDigital think we may need new preconfigurations as well.

Agreements:

Introduce a new SIB for sidelink positioning parameters.

Introduce new preconfigurations for sidelink positioning.

P3-P13 (MAC issues)

[R2-2312441](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312441%20Discussion%20on%20remaining%20issues%20for%20lower-layer%20related%20sidelink%20positioning.docx) Discussion on remaining issues for lower-layer related sidelink positioning ZTE Corporation discussion Rel-18 NR\_pos\_enh2

Open issue: Number of maximum parallel processes for SL-PRS

Proposal 3: For shared pool, MAC spec should also specify the following:

 The maximum number of SL processes that a UE can perform SL-PRS transmission (within the 16 SL processes), the candidate value can be {2,4,6,8,12,16};

 The maximum number of SL processes that a UE can perform SL-PRS transmission using scheme 2 (within the 4 SL processes for mode 2), the candidate value can be {1,2}.

Proposal 4: for shared pool, introduce UE capability on the maximum number of SL processes that UE can support to jointly transmit SL-PRS and SL-data.

Proposal 5: In dedicated pool, specify the maximum number of parallel processes that a Tx UE can use for dedicated SL-PRS transmission.

Discussion:

Huawei think based on previous discussions, the number of HARQ processes should be decided by RAN1. ZTE would be fine with sending an LS to RAN1, but for P5, they think the dedicated pool does not have sidelink processes and the maximum number of parallel processes is in RAN2 scope.

ZTE think on P4, if the value is specified in the MAC we do not need a capability.

Huawei think we can just ask RAN1 what the maximum number of parallel SL-PRS transmissions is. They have reused the “sidelink process” definition in the MAC CR, but it may not be relevant to RAN1.

Ericsson wonder if there are ACKs for SL-PRS. ZTE indicate that for shared pool there are sidelink processes with ACK/NACK feedback for data only, but not for dedicated pool, where there are only parallel processes without feedback. Sony wonder how the feedback works if the SL-PRS transmission is not unicast. ZTE clarify that there is no feedback for SL-PRS.

Ericsson understand that then the proposal should be to follow legacy operation.

Huawei understand that for SL communication, there is only ACK/NACK feedback for unicast and groupcast, and whether we support reTx of SL-PRS is still under discussion.

ZTE clarify that ACK/NACK feedback and retransmission are decoupled.

Intel have the understanding that RAN1 do not have a concept of ACK/NACK feedback for SL-PRS transmissions. They think this is an essential aspect to resolve, but we may need information from RAN1 side.

Lenovo understand that reTx without feedback is just repetitions, and the feedback only applies to data. OPPO think in this case we do not need to ask RAN1 anything, because they have defined a repetition number already. Lenovo understand that it follows the reservation period, and the question would be the number of parallel processes.

CEWiT want to confirm that the RAN1 agreement says they will not support ACK/NACK feedback for SL-PRS. ZTE have the same understanding. Huawei think in that case we do not need to discuss the ACK/NACK issue and ZTE’s proposal 5 still holds. They understand that we will need to send a general LS to RAN1 with questions that can include this one.

Open issue: SL-PRS in retransmission opportunity

Proposal 6: When the Tx resource (re-)selection is triggered in the dedicated resource pool, the number of retransmissions should be selected/reselected.

Proposal 7: For both dedicated pool and shared pool and both scheme 1 and scheme 2, the retransmission opportunity should transmit SL-PRS with a same SL-PRS characteristic (e.g., destination, session, delay budget, cast type, priority) as the SL-PRS in the initial transmission opportunity, even though the physical resources of initial transmission opportunity and retransmission opportunity can be different.

Proposal 8: For resource allocation scheme 1 and scheme 2, SL-PRS can be transmitted on SL-PRS shared resource pool when the MAC PDU has been positively acked.

Proposal 9: For resource allocation scheme 1 and scheme 2, SL-PRS occasion/grant should not be cleared on SL-PRS shared resource pool when the MAC PDU has been positively acked.

Discussion:

ZTE clarify that on P8, it is a concern that data could be transmitted together with SL-PRS, the data could be acked, and the SL-PRS could still need to be retransmitted. Huawei think RAN1 are discussing this, and we could either wait for their progress or send an LS.

InterDigital interpret that there is no harm in retransmitting the SL-PRS. OPPO agree that retransmission is OK, but they think something needs to be decided about what to retransmit: the already built MAC PDU or a reduced version.

Huawei think it is a RAN1 discussion.

Open issue: flow control of SL-PRS transmission

Proposal 10: For both dedicated pool and shared pool and both scheme 1 and scheme 2, if the SL-PRS with the certain priority is transmitted to the certain destination consecutively for X times, this priority to this destination should be suspended for Y times.

Discussion:

Huawei agree that this resembles legacy behaviour, but they do not think it is an essential issue in this case; they think it can be left to UE implementation to avoid starvation for certain destinations.

Intel wonder exactly what the legacy behaviour is. ZTE indicate that it is embedded in the LCP procedure, where data are marked with the rate of the logical channel and data size, but here we do not have either a size or a rate, so they think we can use a simpler mechanism to keep one transmission from occupying the radio resources forever.

Huawei add that LCP cannot always solve priority-based starvation of a certain destination, and they think this proposal goes beyond what SL communication has.

InterDigital agree with Huawei.

Intel understand that the SL-PRS transmission is service-based, and flooding may not be a problem compared to data transmission. They agree with Huawei that this is something of an enhancement and can be left to UE implementation.

ZTE think leaving it to UE implementation will be a problem if UEs set priorities in a greedy manner, and they see this as a basic procedure.

Open issue: whether CG formula can be applied to SL-PRS

Proposal 11: The formula of determining current slot in a CG config should be reused to determine current slot of dedicated pool. Detailed parameters in the formula should wait for RAN1’s parameter list.

Empty data indication in the MAC subheader

Proposal 12: Tx UE can use one of the reserved bits in the SL-SCH subheader of the MAC PDU to indicate the MAC PDU contains actual SL data, or all of the MAC SDUs or MAC CEs in the MAC PDU only contains padding bits.

Tx resource(s) (re) selection check

Proposal 13: For shared pool, the sl-ReselectAfter should have a larger value range, and the number of unused transmission opportunities on resources indicated in the selected sidelink grant should incremented by 1 when either an initial transmission opportunity or a re-transmission opportunity in a resource reservation interval is not used.

Agreements:

Ask RAN1 for the maximum number of parallel processes that a Tx UE can use for dedicated SL-PRS transmission in dedicated/shared pool. Can be included in a general LS with questions to RAN1.

Ask RAN1 about retransmission of SL-PRS in shared pool when accompanying data have been acknowledged.

[R2-2311861](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2311861%20Remaining%20issues%20on%20higher%20layer%20aspects%20for%20sidelink%20positioning.docx) Remaining issues on higher layer aspects for sidelink positioning vivo discussion Rel-18 FS\_NR\_pos\_enh2

[R2-2311862](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2311862%20Discussion%20on%20remaining%20issues%20of%20SL-PRS%20transmission.docx) Discussion on remaining issues of SL-PRS transmission vivo discussion Rel-18 FS\_NR\_pos\_enh2

[R2-2311929](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2311929_Sidelink_Fraunhofer.docx) UE Positioning using Sidelink Fraunhofer IIS, Fraunhofer HHI discussion

[R2-2312024](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312024.docx) MAC related open issues on SL positioning Intel Corporation discussion Rel-18 NR\_pos\_enh2

[R2-2312127](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312127%20SLPP%20and%20SLpos%20caps.doc) Further discussion on SLPP and SL positioning capabilities Lenovo discussion Rel-18 NR\_pos\_enh2

[R2-2312254](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312254%20Discussion%20on%20higher%20layer%20aspects%20for%20Sidelink%20Positioning.docx) Discussion on higher layer aspects for sidelink positioning Huawei, HiSilicon discussion Rel-18 NR\_pos\_enh2

[R2-2312266](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312266%20Control%20plane%20open%20issues%20for%20R18%20sidelink%20poisitioning.docx) Control plane open issue for R18 SL positioning Huawei, HiSilicon, Ericsson discussion Rel-18 NR\_pos\_enh2

[R2-2312310](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312310-SL-POS-capabilities-v0.docx) SL Positioning Capabilities Apple discussion Rel-18 NR\_pos\_enh2

[R2-2312311](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312311-LS-discovery-v0.docx) [DRAFT] Reply LS on Sidelink positioning procedure Apple LS out Rel-18 NR\_pos\_enh2 To:SA2, CT1 Cc:RAN1, SA3

[R2-2312370](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312370%20Remaining%20issues%20on%20R18%20sidelink%20positioning.docx) Remaining issues on R18 sidelink positioning LG Electronics Inc. discussion Rel-18

[R2-2312442](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312442%20Discussion%20on%20remaining%20issues%20for%20higher-layer%20related%20sidelink%20positioning.docx) Discussion on remaining issues for higher-layer related sidelink positioning ZTE Corporation discussion Rel-18 NR\_pos\_enh2

[R2-2312554](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Docs\R2-2312554.zip) Further discussion on sidelink positioning SLPP left issue OPPO discussion Rel-18 NR\_pos\_enh2

* Revised in R2-2313572

[R2-2313572](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2313572%20Further%20discussion%20on%20sidelink%20positioning%20SLPP%20left%20issue.docx) Further discussion on sidelink positioning SLPP left issue OPPO discussion Rel-18 NR\_pos\_enh2

[R2-2312555](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312555%20Discussion%20on%20sidelink%20positioning%20leftover%20MAC%20issue.docx) Discussion on sidelink positioning leftover MAC issue OPPO discussion Rel-18 NR\_pos\_enh2

[R2-2312566](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312566%20Discussion%20on%20remaining%20issues%20for%20SL%20positioning.docx) Discussion on remaining issues for SL positioning Spreadtrum Communications discussion Rel-18

[R2-2312724](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312724%20Discussion%20on%20SL%20positioning%20open%20issues.doc) Discussion on SL positioning open issues Xiaomi discussion Rel-18

[R2-2312807](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312807_SLPosDiscussion.docx) Remaining issues on SL Positioning Lenovo discussion Rel-18

[R2-2312836](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312836_SL_Pos_Res_Final.docx) Considerations on multiplexing, congestion control and ARP Sony discussion Rel-18 FS\_NR\_pos\_enh2

[R2-2312934](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312934%20(R18%20NR%20POS%20A722%20SL%20POS).docx) Discussion on sidelink positioning InterDigital, Inc. discussion Rel-18 NR\_pos\_enh2

[R2-2312937](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312937%20SL.docx) Remaining issue for NW involved Sidelink positioning Ericsson discussion Rel-18

[R2-2313059](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2313059%20-%20Handling%20of%20Sequence%20ID.docx) Handling of SequenceID in SLPP Philips International B.V. discussion NR\_pos\_enh2

[R2-2313270](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2313270%20Discussion%20on%20MAC%20open%20issues.doc) Discussion on MAC open issues Samsung discussion NR\_pos\_enh2-Core

[R2-2313329](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2313329_(SLPP).docx) Further Considerations on SLPP Design Qualcomm Incorporated discussion

[R2-2313340](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2313340%20open%20issue%20for%20SLPP%20design_v3.docx) Discussion on the selected remaining issues on SLPP design Samsung R&D Institute UK discussion

[R2-2313356](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2313356-Further%20Discussions%20on%20Sidelink%20Positioning%20and%20Ranging.docx) Further discussion on SL positioning and ranging CEWiT discussion

[R2-2313484](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2313484.docx) Discussion of MAC and resource allocation aspects Nokia Netherlands discussion Rel-18

[R2-2313503](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2313503.docx) Discussion of SLPP signalling procedures Nokia Netherlands discussion Rel-18

[R2-2313539](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2313539%20Providing%20Anchor%20UE%20location%20uncertainty.docx) Providing Anchor Location Uncertainty Philips International B.V. discussion NR\_pos\_enh2

Documents on SLPP forwarding or discovery metafield (disallowed topics)

[R2-2313480](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2313480.docx) Discussion of SLPP forwarding aspects Nokia Netherlands discussion Rel-18

### 7.2.3 RAT-dependent integrity

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

[R2-2313119](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2313119%20Remaining%20Issues%20for%20RAT-dependent%20integrity.docx) Remaining Issues for RAT-dependent integrity CATT discussion Rel-18 NR\_pos\_enh2

Proposal 1: RAN2 agree to introduce separate ARP location error bound in NR-TRP-LocationInfo including mean and Standard deviation.

Discussion:

vivo understand from RAN1 side that they did not expect RAN2 to introduce separate bounds for TRP and ARP, and they assume the TRP location error bound can be reused. They also think we can wait for RAN3 progress.

Qualcomm think there is a relation to P2, and “separate error bound” is a bit misleading. They understand what we need is the error bound for the ARP location (or whatever location is provided). They think the ASN.1 needs to support the bound at all levels, and the rest is a field description exercise.

Huawei agree with Qualcomm and think at the current stage the safe choice is to introduce signalling for the error bound at all levels as an optional field, and consider specifying in the field description when it is included (which could be worked on in maintenance).

Nokia think we could simplify it by having a single location rather than multiple ways for giving the location of the TRP. CATT indicate the TRP location is there, and the definition is there from Rel-16 including the TRP location and the ARP location.

Proposal 2: RAN2 discuss the stage-3 issue on the bound of relative location and agree:

-when the reference point is a real location, the bound of reference point is required.

-when the reference point is not a real location, i.e. a mathematics reference point, the bound of reference point is not required. The bound of TRP/ARP location is included in the bound of relative location.

Discussion:

Qualcomm think there is no real distinction between the cases; the location is provided as a reference point and a delta, and we need to bound the error in the provided location. They do not see a need to bound the reference point separately.

CATT wonder if the bound for TRP location includes the bound of the reference point. Qualcomm understand that it does, but the reference point bound does not need to be provided separately.

Ericsson have the same understanding as Qualcomm. There is an uncertainty for the reference point and the relative location, but we do not need to bound them separately.

CATT have the same understanding.

Proposal 3: RAN2 to agree that the Probability of Onset of TRP fault and Mean TRP fault duration work for all error sources, and agree the range of Probability of Onset of TRP fault and Mean TRP fault duration follows A-GNSS parameters probOnsetSatFault and meanSatFaultDuration as below:

ProbOnsetTRP-Fault-r18 INTEGER (0..255),

MeanTRP-FaultDuration-r18 INTEGER (1..3600),

Proposal 4: RAN2 sends an LS to SA2 to inform that integrity requirements are not only for GNSS integrity but also for RAT-Dependent integrity, and RAN2 kindly asks SA2 to check if there are any impacts in SA2 specifications.

Agreements:

Introduce error bounds for all levels at which location can be provided, as optional fields. Conditions for inclusion can be worked on in CR implementation.

No separate error bound is introduced for the reference point as distinct from the location bound; the error bound for the location includes any error bound associated with the reference point. Can be clarified in field description.

The Probability of Onset of TRP fault and Mean TRP fault duration work for all error sources, with ranges following A-GNSS parameters (0..255 and 1..3600 respectively). To be checked in CR review.

[R2-2312938](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312938%20Integrity.docx) Open issues for RAT-dependent integrity Ericsson discussion Rel-18

Proposal 1 Send an LS to CT4/SA2 providing details for the Integrity results to be provided to the LCS client. The client should be informed which entity performed the integrity and the outcome of the result whether Integrity condition was fulfilled or not.

Discussion:

Qualcomm think we have already answered the question on what the integrity requirements are, and there is no change compared to Rel-17 integrity. The KPIs and the result are the same.

Ericsson think the introduction of LMF-based integrity makes a difference.

CATT wonder if there is a relation to mode 1/mode 2 reporting, which we have discussed several times without agreeing to support mode 2 reporting even for LMF-based.

OPPO wonder why we would need to inform the LCS client which entity performed the integrity.

Huawei agree with OPPO and think we have covered the CT4 aspects already.

Proposal 2 Refine the LPP periodic location information reporting interval from seconds to milliseconds.

Discussion:

Ericsson clarify that they see a need for more frequent reporting for moving PRUs. They also think it will be necessary for CPP.

Proposal 3 Refine the LPP periodic location information reporting interval from seconds to milliseconds in Rel 17

Proposal 4 Agree to the LPP text proposal in Appendix A

### 7.2.4 LPHAP

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

[R2-2313249](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2313249_Remaining%20issues%20on%20LPHAP.docx) Remaining issues on LPHAP Samsung discussion Rel-18 NR\_pos\_enh2

UE autonomous TA adjustment:

Proposal 1: The TAT (i.e., srs-ValidityAreaTimeAlignmentTimer) is restarted when the UE autonomously adjust the TA.

Discussion:

CATT agree with the proposal since the UE can still send SRS under these circumstances.

vivo do not think the UE should restart the timer, as the network is not aware of the action; they understand the autonomously adjusted TA is less stable and the UE should not continue SRS transmission when the original TA is expired.

OPPO agree with vivo and think misalignment of the timer between UE and gNB can occur.

Huawei agree with OPPO and vivo, to keep alignment with the network. They think the UE should release non-preconfigured SRS configuration when the timer expires.

Ericsson have the same understanding that the timer should not be restarted.

Xiaomi wonder why alignment between the UE and the network is needed, since the UE may have reselected.

Samsung understand we have so far agreed to rely on explicit release from the network and not agreed to use the timer expiration, and they see that if the configuration is not released there is no problem.

CATT think we should decouple the timer and configuration discussions. Samsung agree and note that the original usage of the timer was not to control SRS transmission.

Huawei indicate that the need for synchronization between the UE and the network is that the network will use the TAT to control SRS transmission.

ZTE indicate that in RAN4 specs, there is a requirement that the UE can autonomously adjust the TA without a timer restart, and if we allow the UE to restart the timer we will be inconsistent with that.

Xiaomi note that when the UE receives the TA command, the timer will be restarted; they think if the TA is updated autonomously, a similar restart should occur, and they see this as in line with Rel-17.

Huawei think it is quite different from Rel-17, where TA update is based on the network command. They think there is a risk of the UE transmitting SRS forever.

Samsung think the LMF can trigger an appropriate release of the SRS configuration. OPPO think explicit release should not be the default behaviour, because we should be conserving UE power.

CATT note that the SRS transmission is not uncontrolled but tied to the deferred MT-LR event.

Huawei agree the transmission is triggered, but the UE should still have the network’s permission.

Chair wonders what fails if we do not restart the timer. Samsung understand the intention of the autonomous TA update is to allow the UE to continue its transmission, and if it cannot do this the result may be a positioning/measurement failure. ZTE think this is a corner case and the intention is to prevent frequent stoppage of transmission if the timer is small, but here the timer should be relatively large.

Qualcomm see Samsung’s point and think there is a bit of a contradiction in the concept of the timer; if the UE can adjust the TA, it does seem to extend the validity period.

Ericsson think the main motivation is to avoid interference from resynchronisation, and they agree with ZTE that the timer should be “large enough”; they would also like to avoid desync between the UE and the network.

Sony wonder if this means a UE that is stationary will expire and stop transmission sooner than a moving UE that can keep restarting.

Nokia think if you do not restart the timer, the UE is not given a fair amount of time to reassess the TA at the next cycle.

Huawei agree with Ericsson’s view on interference, and they think there is some confusion in this discussion. They understand that the MAC timers are always synchronised with the network.

Nokia think we could ask RAN1 and handle the reply as maintenance.

Sony understand the gNB does not know the value of the timer if the UE restarts it, and they think it is strange that the UE is allowed to update the timer at cell reselection but not when moving within the cell.

OPPO understand Sony’s intention and think it is unfair to a stationary UE to force the timer to expire sooner than a moving UE.

Show of hands:

Restart the timer: 6

Do not restart the timer: 10

Proposal 2: When the UE performs cell reselection within the validity area, if autonomousTA-AdjustmentEnabled is configured, RRC can indicate MAC to trigger autonomous TA adjustment.

Proposal 3: When the upper layer indicates the MAC to trigger autonomous TA adjustment, MAC can perform the following procedure if there is ongoing SRS transmission.

1. instruct PHY to adjust TA, 2) restart TAT timer (i.e., srs-ValidityAreaTimeAlignmentTimer), and 3) update the stored RSRP.

Discussion:

Apple think there is no need to capture the inter-layer interaction. vivo see some value in capturing it.

ZTE think P2/P3 are not technical functionality and can be considered in CR implementation.

Agreements:

Do not restart the TAT when the UE autonomously adjusts the TA.

Can be discussed in CR implementation if there is a need to capture inter-layer interaction for autonomous TA adjustment.

SRS configuration request via RRCResumeReqeust:

Proposal 4: The SRS configuration request via RRCResumeRequest can be also used for the case without validity area.

Discussion:

Xiaomi think a validity area of one cell is the same as Rel-17, so they support the proposal.

vivo think this is more of a TEI17, because in Rel-18 there will always be a validity area.

Qualcomm agree with the proposal and think it relates to preconfigured SRS, which may not have a validity area.

Ericsson understand that the validity area is for multiple cells and we should not optimise for a single cell.

ZTE wonder what the intention is; does it introduce a new Rel-17 behaviour or only for Rel-18 preconfigured SRS? Samsung clarify it is only for preconfiguration.

Huawei agree with vivo and Ericsson; they think for an activation request, the UE should first check if the cell is within the validity area, and accordingly preconfigured SRS should have a validity area too.

vivo checked the WID and understand that the SRS configuration enhancements are related to the validity area.

OPPO disagree with the proposal because the UE behaviour for this case is already in Rel-17.

InterDigital think this is a configuration issue and we do not need the agreement.

Proposal 5: The UE capability on supporting SRS configuration request via RRCResumeRequest is needed.

Discussion:

Ericsson think we may need a capability for the validity area, but not for the request. vivo agree with Ericsson.

Xiaomi prefer not to introduce a separate capability.

Potential enhancement on LPP on-demand PRS request:

Proposal 6: RAN2 to support UE to include requested DL-PRS resource set duration/start offset associated with each requested periodicity to align with Paging Occasion timing.

(The TP for P3 in Annex can be used for baseline.)

Proposal 7: RAN2 to support the UE to include two separate requested DL-PRS information in the on-demand PRS request, considering the case 2 (i.e., two different DRX cycle for inside and outside the PTW) and the case 3 (i.e., two different DRX cycle for CN PTW and RAN PTW.).

Proposal 8. RAN2 to support the UE to include requested DL-PRS transmission activation periodicity/start offset/duration associated with each requested DL-PRS information to align with periodic PTW timing.

(The TP for P4, P5 in Annex can be used for baseline.)

[R2-2313319](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2313319%20LPHAP%20SRS%20Config%20Release.docx) LPHAP issue of area-specific SRS configuration release Nokia, Nokia Shanghai Bell discussion Rel-18 NR\_pos\_enh2-Core

Proposal 1: UE should release the area-specific SRS configuration when the area-specific TA timer is not running.

Discussion:

Nokia think the alternative would have RAN3 impact.

ZTE note the proposal says “is not running”, which conflates two cases: cell reselection and timer expiry. They think the cases should be considered separately; they support release at expiry.

Qualcomm do not see a strong need to release the configuration when the UE may move back into the validity area, even if the timer expires. They think explicit release is the only solution needed.

OPPO agree with the proposal; regarding ZTE’s cell reselection scenario, they note the network is unaware of the reselection and the UE may come back to the original cell.

Huawei think the only difference between Rel-17 and Rel-18 is preconfiguration. In Rel-17, the UE releases the SRS configuration at reselection or expiry, and here they think the situation is the same if we do not have preconfiguration, but they think a preconfigured SRS configuration could be maintained.

Sony agree that there may be no need to release the configuration, and the release is separate from SRS transmission as such.

vivo think even if the UE reselects out of the validity area, it should keep the configuration so it can use delta configuration in the new cell.

Lenovo prefer to release the configuration; otherwise they wonder how to handle the configuration, whether it should be kept as a preconfiguration that can be reactivated, etc.

CATT prefer to decouple the timer with the release; they think if we take P1, the serving gNB will have to interact with other gNBs and the LMF and it will require RAN3 work. They agree with Qualcomm that explicit release is enough.

Agreement:

For preconfigured SRS, the configuration is released only when the network releases it explicitly.

Show of hands:

For non-preconfigured SRS, release the configuration when the timer is not running: 6

For non-preconfigured SRS, maintain the configuration when the timer is not running: 7

ZTE think the SOH is a bit misleading because of the two different cases.

Sony think it may not matter because the UE will eventually receive a new configuration anyway. CATT think the gNB needs to be aligned with the UE in understanding of the SRS configuration.

Huawei think we could follow legacy operation, allowing the network also release the resources; on CATT’s concern, they do not think any extra network operation is needed.

Proposal 2: RAN2 should consider the last serving gNB triggering other cells in the validity area to release the area-specific SRS configuration when the area-specific TA timer is not running.

* [AT124][414][POS] Release of SRS configuration when TAT is not running (Nokia)

Scope: F2F offline to discuss the impact of releasing the (non-preconfigured) SRS configuration when the TAT is not running (expiry or cell reselection). Attempt to converge on a way forward considering the level of impact if the release is supported.

Intended outcome: Report to CB session in R2-2313806

Schedule: Wednesday 2023-11-15 1700-1730 in Brk1

Deadline: Thursday 2023-11-16 1000 CST

[R2-2313806](C:\\Users\\mtk16923\\Documents\\3GPP Meetings\\202311 - RAN2_124, Chicago\\Extracts\\R2-2313806 [AT124][414][POS] LPHAP_v01_Rapp.docx" \o "C:\Users\mtk16923\Documents\3GPP Meetings\202311 - RAN2_124, Chicago\Extracts\R2-2313806 [AT124][414][POS] LPHAP_v01_Rapp.docx) Report for [AT124][414][POS] Release of SRS configuration when TAT is not running (Nokia) Nokia discussion Rel-18 NR\_pos\_enh2

The offline discussion did not achieve any consensus both on the list of impacts identified (see above) for releasing the non-preconfigured SRS configuration when TAT is not running and, on the way forward options listed at the start of the offline discussion. We could only agree to list where each company stood on what should be the way forward for this issue. This is captured below.

Options:

1. Follow Rel-17 behaviour for non-preconfigured SRS configuration to release the SRS configuration. (Lenovo, Huawei, Ericsson, ZTE, IDT, Intel, Oppo, Nokia, Sony). See NOTE 1.

2. Network explicit release only in Rel-18 (Xiaomi, Vivo, Samsung, LG, CATT).

3. Report no consensus from offline.

NOTE 1: With option 1, the network explicit release option that RAN2 already agreed is still there.

Discussion:

Nokia note that there was a majority for option 1.

CATT think this is not a blocking issue for the WI. They think there are issues with option 1; it has a precondition that the TAT in UE and gNB should be aligned, but they see several cases where this alignment is not there (e.g., when the UE restarts the TAT with a different gNB from the original serving gNB); and in addition we agreed that the UE stops the timer when it reselects out of the validity area, and CATT see that this can result in the gNB not knowing that the timer has been stopped.

Ericsson think even with RACH-based SDT, the new gNB will get the context from the old gNB and it can release the configuration; for the reselection scenario mentioned by CATT, they see that either the UE could send an RRCResume and inform the network that it is out of validity area, or we could introduce a new timer.

Huawei agree with Ericsson’s point about the RRCResume and think this is the behaviour that we already agreed. They also note that the discussion has been rather detailed and think there is a clear majority, and further think that it should be agreeable that the UE releases the configuration when it moves out of the validity area.

Sony think we have discussed the timers already and there is some confusion about their functions. They see that the area-specific timer could be longer. They also think we should not force the UE to trigger a resume just to get a release.

OPPO understand that we have not concluded on another timer. To CATT’s point, they wonder if the UE comes back to the validity area and keeps the configuration, but the TAT was stopped, how the UE should restart the timer: autonomously or by exchanging signalling?

CATT think in this scenario the UE can send a request to the gNB.

Intel think we agreed that if the UE needs an update it will exchange signalling with the network, and the scenario of moving to a new validity area is similar; the UE can send an RRCResume.

Samsung see the benefit of enabling delta configuration in this case, and they think the explicit release is not broken. They think we can stick to the current agreement if there is no real technical issue.

Huawei do not understand why we discuss the delta configuration; on the modelling of two timers vs. one, they understand the reason to model the current spec with a separate timer is that the behaviour of the timer is different, e.g., on cell reselection within the validity area.

OPPO think a second timer complicates the UE behaviour.

Xiaomi see impact if the UE releases the SRS, but no impact if it does not, so they see option 2 as preferable. OPPO think there is upper layer spec impact to manage the timer when the UE comes back to the validity area, which requires uplink sync and would call for a new RACH cause.

InterDigital do not see a technical issue with option 1.

Sony want to withdraw their support for option 1.

Xiaomi indicate that the current CR allows the UE to continue transmission when it receives the TA command.

Intel do not see a problem either way. They do not think the timer desync causes a problem; the gNB will just discard the configuration when the TAT expires on its side. The UE may prolong the TAT, but the source gNB will still need to know when the configuration can be released, so it needs to contact the current serving gNB, and if the UE can get a new TA from the serving gNB within the validity area, the source gNB can also be aware of the UE’s status.

CATT think when the UE stops the timer and the gNB still runs it, the UE will not release the SRS configuration but the gNB will.

Intel understand that when the UE reselects out of the cell and stops the TA timer, it will release the configuration in option 1.

Huawei agree with Intel and think option 1 just follows legacy operation; they see CATT’s concern as a corner case.

Ericsson also agree with Intel; they wonder if the UE has left the validity area and the new cell is not part of any validity area, whether it should send RRCResume or not. Qualcomm understand that the UE will send RRCResume only if it needs to do a further positioning operation. CATT indicate we agreed previously that when the UE reselects out of the validity area, the UE may send an RRC message to the network for configuration request.

CATT wonder about what happens when the UE restarts the TA timer without the knowledge of the gNB.

Huawei think if the UE resumes in a new cell, there will be an information exchange on the network side to retrieve the UE context.

CATT would prefer to further discuss the options, since they do not see it as a blocking issue.

Ericsson think we should follow the majority view, but we could be open to further discussion next meeting.

Agreement:

Implement the already agreed network explicit release in the running CR. Additional behaviour can be discussed in maintenance.

Rel-18 positioning WI is complete from RAN2 perspective.

P1 (access category)

[R2-2311864](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2311864%20Discussion%20on%20remaining%20issues%20of%20LPHAP.doc) Discussion on remaining issues of LPHAP vivo discussion Rel-18 FS\_NR\_pos\_enh2

Proposal 1: RAN2 to discuss which Access Category（e.g., 8） is selected for the RRC resume procedure for SRS configuration/activation request.

Discussion:

vivo indicate this is the same category as RNA update.

Agreement:

Access category 8 is used for the RRC resume procedure for SRS configuration/activation request.

P1+P5 [WAs on resume causes]

[R2-2312025](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312025%20LPHAP.docx) Further considerations on LPHAP Intel Corporation discussion Rel-18 NR\_pos\_enh2

Proposal 1: For SRS for positioning activation/request procedure(s), confirm the WA, i.e. when the UE reselects out of the positioning validity area during SRS transmission, the UE may send an RRC message to the network for SRS configuration request. The SRS configuration request is sent in the RRC message RRCResumeRequest via a new resume cause.

Proposal 5: For preconfigured multiple SRS configurations, confirm the WA, i.e. UE sends a new ResumeCause of RRCResumeRequest message to indicate the change or activations of SRS configuration when different SRS configuration is selected due to the change of validity area .

Discussion:

OPPO wonder if we have agreed to preconfigured multiple SRS configurations. vivo understand it is in the WID.

WID wording is “one or more”. OPPO think we need to confirm if we support more than one, and they see that it would involve a lot of network interaction, without offering a lot of benefit since the UE can request another configuration.

Qualcomm think we took the agreement that the validity areas do not overlap, and they understand that this implies multiple configurations.

Ericsson think as a baseline, the UE can have only one SRS configuration in one validity area, but it can be given multiple configurations in different validity areas.

Huawei agree with Qualcomm that there can be multiple validity areas.

OPPO think RAN3 would need to be involved. Huawei understand that they are already discussing it.

Agreements:

For SRS for positioning activation/request procedure(s), confirm the WA, i.e. when the UE reselects out of the positioning validity area during SRS transmission, the UE may send an RRC message to the network for SRS configuration request. The SRS configuration request is sent in the RRC message RRCResumeRequest via a new resume cause.

For preconfigured multiple SRS configurations, confirm the WA, i.e. UE sends a new ResumeCause of RRCResumeRequest message to indicate the change or activations of SRS configuration when different SRS configuration is selected due to change of validity area, or when a new SRS configuration is selected where none was previously in use.

The same new resume cause is used for both cases.

P14 (WA on PRS alignment capability)

[R2-2312440](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312440%20Discussion%20on%20remaining%20issues%20for%20LPHAP.docx) Discussion on remaining issues for LPHAP ZTE Corporation discussion Rel-18 NR\_pos\_enh2

Proposal 14: confirm the WA that don’t introduce the UE capability on supporting alignment of PRS to fixed (e)DRX.

Agreement:

Confirm the WA not to introduce the UE capability on supporting alignment of PRS to fixed (e)DRX.

[R2-2311930](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2311930_LPHAP_Fraunhofer.docx) Reliable LPHAP position with extended DRX cycle Fraunhofer IIS, Fraunhofer HHI discussion R2-2309579

[R2-2312253](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312253%20Discussion%20on%20LPHAP.docx) Discussion on LPHAP Huawei, HiSilicon discussion Rel-18 NR\_pos\_enh2

[R2-2312401](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312401%20R18%20NR%20POS%20A724%20LPHAP.doc) Discussion on LPHAP InterDigital Inc. discussion Rel-18

[R2-2312465](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312465%20Discussion%20on%20low%20power%20high%20accuracy%20positioning.doc) Discussion on low power high accuracy positioning Lenovo discussion Rel-18

[R2-2312556](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312556%20Discussion%20on%20the%20leftover%20issues%20of%20LPHAP%20enhancement.docx) Discussion on the leftover issues of LPHAP enhancement OPPO discussion Rel-18 NR\_pos\_enh2

[R2-2312753](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312753%20Discussion%20on%20LPHA%20positioning.doc) Discussion on LPHA positioning Xiaomi discussion

[R2-2312803](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312803_(LPHAP).docx) Remaining issues for LPHAP Qualcomm Incorporated discussion

[R2-2312837](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312837_LPHAP_Final.docx) Remaining considerations on Low Power High Accuracy Positioning Sony discussion Rel-18 FS\_NR\_pos\_enh2

[R2-2312939](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312939%20LPHAP.docx) Remaining issue on Low Power High Accuracy Positioning Ericsson discussion Rel-18

[R2-2313120](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2313120%20Discussion%20on%20leftover%20issues%20of%20LPHAP.docx) Discussion on leftover issues of LPHAP CATT discussion Rel-18 NR\_pos\_enh2

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

RAN1 led objectives that may require progress in RAN1 before RAN2 can take decisions.

[R2-2313123](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2313123%20Discussion%20on%20leftover%20issues%20of%20Carrier%20Phase%20Positioning.docx) Discussion on leftover issues of Carrier Phase Positioning CATT discussion Rel-18 NR\_pos\_enh2

Proposal 1: RAN2 agree with the indicated time window serves per TRP, per PFL (if applied to different PFLs).

Discussion:

CATT note that the time window also applies to legacy measurements.

ZTE think the window is per UE, not per TRP per PFL, because RAN1 agreed that within the window several TRPs and several resources sets can be configured, and the parameter list shows it as per-UE. Xiaomi agree with ZTE.

Huawei understand that it is a common window covering all TRPs, but they think we can align with the RAN1 parameter list. Nokia think we need to wait for RAN1 guidance based on our LS with questions at the last meeting.

Qualcomm think the answer should come from RAN1.

ZTE understand RAN1’s reply is already reflected in the parameter list.

Proposal 2: RAN2 agree to request the measurement in the indicated the resource sets within time window following the NR-DL-PRS-Info structure.

Discussion:

CATT indicate this is a question of different preferences on the ASN.1 design.

Qualcomm think this is a RAN1 decision. Huawei agree with Qualcomm. Intel agree that we should wait for RAN1.

Proposal 3: RAN2 agree provide RSCP in PRU Info and support the changes of location in PRU Info following the Cond NotSameAsPrev for relative location in NR-TRP-LocationInfo.

Discussion:

CATT understand RAN1 has not addressed this, but we can wait for the RAN1 reply. They consider that the question of whether the PRU can move has not been covered in RAN1 guidance.

Qualcomm wonder how it fits with the case that the LMF has not requested the PRU’s location; if the LMF does not always request the location, how does it know when the PRU has moved and it needs the new location? They think the handling of PRUs needs to be separate from UE-based/UE-assisted.

Ericsson agree with Qualcomm that we need to have a workable solution.

vivo think we should follow the previous agreements and do not need to assume the LMF will always store the PRU location: It can request a new one and the PRU should reply.

Lenovo share Qualcomm’s view that we should consider the whole picture.

Nokia wonder if including RSCP means only RSCP or also legacy measurements; if it means only RSCP, we should wait for RAN1.

Ericsson think the location for retrieving the mechanism is separate from providing it via assistance data.

Nokia are not sure where the mobility requirement comes from. Ericsson think mobile reference stations exist in GNSS.

CATT indicate SA2 already support moving PRUs in Rel-18.

Agreements:

RAN2 will align with RAN1 guidance on the granularity of the time window.

RAN2 will align with RAN1 guidance on the inclusion of RSCP in the PRU info (also any legacy measurements).

Support changes of location in PRU Info using the Cond NotSameAsPrev for relative location in NR-TRP-LocationInfo when PRU location is signalled from the LMF in assistance data.

[R2-2312804](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312804_(PRS%20Aggregation).docx) Remaining Issues for DL-PRS Aggregation Qualcomm Incorporated discussion

Proposal 1: nrMaxNumPRS-BandWidthAggregation-r18 (Max number of linkage information) is 256.

Proposal 2: The available on-demand DL-PRS configurations supporting DL-PRS bandwidth aggregation are indicated via a group of 2 or 3 DL-PRS-Configuration-ID's in IE NR-On-Demand-DL-PRS-Configurations. Up to 8 such groups can be indicated in IE NR-On-Demand-DL-PRS-Configurations.

Proposal 3: The IE NR-On-Demand-DL-PRS-Request can include a list of preferred aggregated DL-PRS configurations in the order of preference, where each aggregated DL-PRS configuration is addressed by its SEQUENCE-index in the IE NR-On-Demand-DL-PRS-Configurations.

Proposal 4: The requested aggregated PFLs can be indicated by its SEQUENCE-index in the IE NR-On-Demand-DL-PRS-Information in IE NR-On-Demand-DL-PRS-Request. The UE can include a list of preferred aggregated DL-PRS configurations in the order of preference.

Proposal 5: Agree the TPs in this contribution (R2-2312804).

Discussion:

CATT support the proposals, but they understand that company comments in review of the LPP running CR indicated that all the on-demand PRS aspects for bandwidth aggregation did not converge fully.

ZTE think RAN1 already agreed that on-demand PRS works with aggregation, and they left the details to RAN2/RAN3. They agree with the number in P1 and think a similar issue exists for SRS aggregation.

Ericsson are not sure about the benefit of the feature. Qualcomm also understand that RAN1 agreed to it.

vivo understand that P2-P4 only cover the ID-based request, not the parameter-based request.

Nokia wonder why the UE requests a specific set of PRS configurations in order of preference in P3. Qualcomm indicate that this exists in the legacy on-demand request and the proposal just adapts it to aggregation.

Intel also understand that RAN1 agreed on this and left the details to RAN2.

Agreements:

nrMaxNumPRS-BandWidthAggregation-r18 (Max number of linkage information) is 256. Equivalent number for SRS can be discussed in CR finalisation.

The available on-demand DL-PRS configurations supporting DL-PRS bandwidth aggregation are indicated via a group of 2 or 3 DL-PRS-Configuration-ID's in IE NR-On-Demand-DL-PRS-Configurations. Up to 8 such groups can be indicated in IE NR-On-Demand-DL-PRS-Configurations.

The IE NR-On-Demand-DL-PRS-Request can include a list of preferred aggregated DL-PRS configurations in the order of preference, where each aggregated DL-PRS configuration is addressed by its SEQUENCE-index in the IE NR-On-Demand-DL-PRS-Configurations.

The requested aggregated PFLs can be indicated by its SEQUENCE-index in the IE NR-On-Demand-DL-PRS-Information in IE NR-On-Demand-DL-PRS-Request. The UE can include a list of preferred aggregated DL-PRS configurations in the order of preference.

ZTE think we need to agree on whether there is a new MAC CE for semi-persistent SRS activation with bandwidth aggregation. Details can be worked out in maintenance.

Huawei think we should not rush on this issue; we indicated to RAN1 that a new MAC CE can be used, but we need to evaluate whether it needs to be used.

Samsung understand the RAN1 requirement was clear that we need a new MAC CE; they think we could agree now to introduce it.

Huawei are not sure why a new MAC CE is necessary. Xiaomi also think the existing MAC CE can be used.

Ericsson think both ways work and we could leave it to maintenance.

Agreement:

The question of whether to use a new MAC CE for semi-persistent SRS activation with bandwidth aggregation can be discussed in maintenance.

[R2-2312838](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312838_RedCap_Final.docx) Discussion on Frequency hopping for Positioning for RedCap Ues Sony discussion Rel-18 FS\_NR\_pos\_enh2

Proposal 1: Parameters should be configured via LPP signalling and either each measurement occasion or semi-consistent for multiple occasions.

Proposal 2: For UL-Tx hopping, the same parameters should be used, and configured via RRC.

Proposal 3: Support the UE capability parameter to reflect the supported frequency hopping operation for NR RedCap UE. (i.e, by considering the RedCap UE constraints / limitations).

Proposal 4: Support the RedCap UE’s processing time for Rx frequency hopping as part of the UE capability.

Proposal 5: For DL Rx hopping or UL Tx hopping, support RedCap UE to report both of the following measurements or only one of them in one measurement report.

- One single measurement based on receiving multiple hops,

- Per-hop measurement

Proposal 6: For DL Rx hopping support RedCap UE to indicate to LMF whether the measurements are based on single or multiple hops.

Proposal 7: To facilitate per-hop measurement, support RedCap UE to report the number of hops and indicate the association between hops (hop ID) and measurements in the positioning measurement report.

Proposal 8: Support frequency hopping to be configurable across multiple DL PRS resources or resource-sets.

Discussion:

On P1, CATT think this is not in line with the most recent parameter list, so we need more information from RAN1. Huawei agree with CATT, and in general they think that these proposals overlap with what we will get from RAN1.

Ericsson think P6/P7 are in RAN2 scope. Qualcomm indicate these are also being discussed in RAN1.

[R2-2312082](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312082%20Discussion%20on%20RAN1%20led%20positioning%20topics.docx) Discussion on RAN1 led positioning topics Huawei, HiSilicon discussion

[R2-2312402](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312402%20R18%20NR%20POS%20A725_NRCP.doc) Discussion on positioning for NR Carrier Phase positioning InterDigital Inc. discussion Rel-18

[R2-2312403](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312403%20R18%20NR%20POS%20A725_RedCap.doc) Discussion on positioning for RedCap UE positionin InterDigital Inc. discussion Rel-18

[R2-2312443](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312443%20Discussion%20on%20remaining%20issues%20for%20BW%20aggregation%20and%20RedCap%20positioning.docx) Discussion on remaining issues for BW aggregation and RedCap positioning ZTE Corporation discussion Rel-18 NR\_pos\_enh2

[R2-2312466](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312466%20Discussion%20on%20RedCap,%20carrier%20phase%20positioning%20and%20PRS,SRS%20bandwidth%20aggregation.docx) Discussion on RedCap positioning, carrier phase positioning and PRS/SRS bandwidth aggregation Lenovo discussion Rel-18

[R2-2312754](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312754%20Discussion%20on%20carrier%20phase%20positioning%20and%20bandwidth%20aggregation%20for%20positioning.doc) Discussion on carrier phase positioning and bandwidth aggregation for positioning Xiaomi discussion

[R2-2312805](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312805_(PRU).docx) Remaining Issues on PRU Operation Qualcomm Incorporated discussion

[R2-2312940](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312940%20RAN1LedTopic.docx) Discussion based upon RAN1 agreements on CPP, RedCap, Bandwidth aggregation Ericsson discussion Rel-18

[R2-2313121](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2313121%20Draft%20LS%20to%20RAN1%20on%20positioning%20issues%20needing%20further%20input.docx) Draft LS to RAN1 on positioning issues needing further input CATT LS out Rel-18 NR\_pos\_enh2 To:RAN1 Cc:RAN3, RAN4

[R2-2313122](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2313122%20Discussion%20on%20leftover%20issues%20of%20%20bandwidth%20aggregation.docx) Discussion on leftover issues of bandwidth aggregation CATT discussion Rel-18 NR\_pos\_enh2

[R2-2313223](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2313223%20CPP%20in%2038.305.docx) Capturing carrier phase positioning in TS 38.305 Nokia, Nokia Shanghai Bell discussion Rel-18 NR\_pos\_enh2-Core

[R2-2313250](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2313250_Remaining%20issues%20on%20BW%20aggregation.docx) Remaining issues on BW aggregation Samsung discussion Rel-18 NR\_pos\_enh2

## 7.9 Enhanced NR Sidelink Relay

(NR\_SL\_relay\_enh-Core; leading WG: RAN2; REL-18; WID: [RP-223501](http://ftp.3gpp.org/tsg_ran/TSG_RAN/TSGR_98e/Docs/RP-223501.zip))

Time budget: 1.5 TU

Tdoc Limitation: 4 tdocs

### 7.9.1 Organizational

Including incoming LSs and rapporteur inputs.

Including, for each affected spec:

* Updated running CR
* List of open issues to be addressed by company contributions
* (where applicable) CR rapporteur input with proposals for stage-3 issues (e.g., signalling details, parameter values/ranges) where company contributrions should be avoided

Including outcome of [Post123bis][420][Relay] Rel-18 relay MAC identified open issues (Apple)

Incoming LS with RAN2 in Cc:

[R2-2311722](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2311722_R3-235761.docx) LS on handling of location information in multi-path operation (R3-235761; contact: LGE) RAN3 LS in Rel-18 NR\_SL\_relay\_enh-Core, 5G\_ProSe\_Ph2 To:SA2 Cc:RAN2

* Noted

Incoming LS from SA3

[R2-2313595](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2313595_S3-235005.docx) LS reply on Reporting of Relay UE C-RNTI and NCGI (S3-235005; contact: Huawei) SA3 LSin Rel-18 NR\_SL\_relay\_enh-Core To:RAN2

* Noted

Discussion:

Apple understand we have not discussed this yet in the context of scenario 2, where the security is outside 3GPP scope.

Huawei think companies have assumed that the connection between UEs is up to implementation, including assurance of security. They think SA3 conclusion aligns with the understanding in RAN2.

vivo think we do not need to discuss it and the assumption should be workable.

Ericsson wonder if we should capture something saying that this is necessary. NEC agree and think a NOTE in stage 2 could be sufficient.

Samsung agree with Ericsson and think we should capture something in stage 2.

Apple think it should be a normative requirement.

Agreement:

Capture in stage 2 a NOTE indicating that the link for scenario 2 must support security of this information.

Incoming LS and related TP

[R2-2311724](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2311724_R3-235770.docx) Reply LS to RAN2 on mode 1 scheduling in inter-DU multi-path (R3-235770; contact: NEC) RAN3 LS in Rel-18 NR\_SL\_relay\_enh-Core To:RAN2

* Noted

[R2-2312219](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312219.docx) (TP for TS 38.300) on mode 1 RA for inter-DU U2N remote UE NEC other Rel-18 NR\_SL\_relay\_enh-Core

* Noted (to be handled in 38.300 CR discussion)

Discussion:

Ericsson think this can be left to the CR discussion.

Agreement:

Align in stage 2 with the RAN3 indication that mode 1 is supported only for the intra-DU case.

Running CRs to 38.331

[R2-2311857](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2311857_Introduction%20of%20NR%20sidelink%20U2U%20relay.docx) Introduction of NR sidelink U2U relay vivo draftCR Rel-18 38.331 17.6.0 NR\_SL\_relay\_enh-Core Revised

* Revised in R2-2311934

[R2-2311934](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2311934_Introduction%20of%20NR%20sidelink%20U2U%20relay.docx) Introduction of NR sidelink U2U relay vivo CR Rel-18 38.331 17.6.0 4400 - B NR\_SL\_relay\_enh-Core

[R2-2311970](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2311970%20Introduction%20of%20Rel-18%20Multi-path.docx) Introduction of Rel-18 Multi-path Huawei, HiSilicon CR Rel-18 38.331 17.6.0 4403 - B NR\_SL\_relay\_enh-Core

[R2-2312499](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312499_38.331_Rel-18_SL_relay_service_continuity.docx) Introduction of Rel-18 SL relay service continuity MediaTek Inc. CR Rel-18 38.331 17.6.0 4432 - B NR\_SL\_relay\_enh-Core

R2-2312689 Introduction of Rel-18 SL relay enhancement Huawei, HiSilicon CR Rel-18 38.331 17.6.0 4441 - B NR\_SL\_relay\_enh-Core Late

* [Post124][403][Relay] Rel-18 relay RRC CR (Huawei)

Scope: Review and finalise the Rel-18 relay RRC CR.

Intended outcome: Agreed CR

Deadline: Short (for RP)

Other running CRs

[R2-2311881](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\38351_CR0027_(REL-18)_R2-2311881%20-%20Introduction%20of%20NR%20sidelink%20relay%20enhancements.docx) Introduction of NR SL Relay enhancement OPPO CR Rel-18 38.351 17.6.0 0027 - B NR\_SL\_relay\_enh-Core

* [Post124][404][Relay] Rel-18 SRAP CR (OPPO)

Scope: Review and finalise the Rel-18 SRAP CR.

Intended outcome: Agreed CR

Deadline: Short (for RP)

[R2-2312029](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312029-Rel-18%20relay%20stage%202%20draft%20CR_v2.doc) Draft running CR 38.300 (update) LG Electronics Inc. draftCR Rel-18 38.300 17.6.0 B NR\_SL\_relay\_enh-Core

* [Post124][405][Relay] Rel-18 relay stage 2 CR (LG)

Scope: Review and finalise the Rel-18 relay stage 2 CR.

Intended outcome: Agreed CR

Deadline: Short (for RP)

[R2-2312182](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\38323_CR0127_Rel-18_R2-2312182_FeatureIntroduction.docx) Introduction of Enhanced NR Sidelink Relay InterDigital CR Rel-18 38.323 17.5.0 0127 - B NR\_SL\_relay\_enh-Core

* [Post124][406][Relay] Rel-18 relay PDCP CR (InterDigital)

Scope: Review and finalise the Rel-18 relay PDCP CR.

Intended outcome: Agreed CR

Deadline: Short (for RP)

[R2-2312337](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312337%20Running%20CR%2038.321_v1.docx) Introduction of NR sidelink relay enhancements Apple (Rapporteur) CR Rel-18 38.321 17.6.0 1703 - B NR\_SL\_relay\_enh-Core

* [Post124][407][Relay] Rel-18 relay MAC CR (Apple)

Scope: Review and finalise the Rel-18 relay MAC CR.

Intended outcome: Agreed CR

Deadline: Short (for RP)

[R2-2312625](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312625.docx) Introduction of enhanced NR sidelink relay Xiaomi CR Rel-18 38.322 17.3.0 0054 - B NR\_SL\_relay\_enh-Core

* [Post124][408][Relay] Rel-18 relay RLC CR (Xiaomi)

Scope: Review and finalise the Rel-18 relay RLC CR.

Intended outcome: Agreed CR

Deadline: Short (for RP)

[R2-2312929](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312929%20-%2038.304_CR0365_Introduction%20of%20Rel-18%20support%20for%20SL%20Relay%20Enhancements.docx) Introduction of Rel-18 SL Relay Enhancements Ericsson CR Rel-18 38.304 17.6.0 0365 - B NR\_SL\_relay\_enh-Core

* [Post124][409][Relay] Rel-18 relay idle mode CR (Ericsson)

Scope: Review and finalise the Rel-18 relay idle mode CR.

Intended outcome: Agreed CR

Deadline: Short (for RP)

[R2-2313527](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2313527%2038.306%20CR1011%20for%20SL%20relay%20enhancement.docx) Introduction of SL relay enhancement Samsung CR Rel-18 38.306 17.6.0 1011 - B NR\_SL\_relay\_enh-Core

[R2-2313528](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2313528%2038.331%20CR4500%20for%20UE%20capability_SL%20relay.docx) Introduction of SL relay enhancement Samsung CR Rel-18 38.331 17.6.0 4500 - B NR\_SL\_relay\_enh-Core

* [Post124][410][Relay] Rel-18 relay capabilities (Samsung)

Scope: Review and finalise the Rel-18 relay capability CRs (38.331 and 38.306).

Intended outcome: Endorsed CRs for merge

Deadline: Short (for merge into mega CR)

MAC open issues email discussion report

[R2-2312336](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312336%20summary%20MAC%20open%20issues%20V18_Rapp_summary.docx) Summary of [Post123bis][420][Relay] Rel-18 relay MAC identified open issues (Apple) Apple discussion Rel-18 NR\_SL\_relay\_enh-Core

Easy Proposals:

Proposal 1: [13/13] Only 1 leg is allowed in the indirect path for MP duplication (i.e., any e2e traffic cannot be duplicated either in PC5 hop or Uu hop in the indirect path) .

Proposal 6: [14/14] Only PDCP duplication in MCG is considered for Rel-18 Multi-path.

Proposal 7: [14/14] MP remote UE reports UL BSR and SL BSR respectively by following legacy procedure. No spec impact foreseen.

Proposal 8: [14/14] Removes the editor note “FFS whether the SL-BSR also reports Uu path traffic buffer“ in clause 6.1.3.33.

Proposal 9: [11/12] only introduce a single new LCID (e.g., LCID 55) for SCCH carrying end-to-end SL-SRB0/1/2/3 messages in L2 U2U relay in MAC spec.

Discussion:

NEC think P7 indicates no enhancement at all for UL BSR or SL BSR, and they think the PC5-RLF case may require some enhancements to the SL-BSR cancellation mechanism. LG do not see a problem with the current mechanism.

LG wonder if P7 also includes buffer size calculation.

Agreements:

Only 1 leg is allowed in the indirect path for MP duplication (i.e., any e2e traffic cannot be duplicated either in PC5 hop or Uu hop in the indirect path) .

Only PDCP duplication in MCG is considered for Rel-18 Multi-path.

MP remote UE reports UL BSR and SL BSR respectively by following legacy procedure, including, e.g., buffer size calculation. No new interdependency is introduced between UL and SL BSRs.

Remove the editor note “FFS whether the SL-BSR also reports Uu path traffic buffer“ in clause 6.1.3.33.

Only introduce a single new LCID (e.g., LCID 55) for SCCH carrying end-to-end SL-SRB0/1/2/3 messages in L2 U2U relay in MAC spec.

Proposals to be discussed:

Proposal 2: [9/13] RAN2 to discuss whether >1 leg (i.e., CA) can be allowed for direct Uu path in PDCP duplication for MP.

Discussion:

Apple understand that either option is feasible.

Xiaomi think there should be no additional impact to support it.

Samsung are OK to leave the current support on Uu for multiple legs, with no spec impact.

OPPO wonder if we support more than one leg, if we would need to discuss handling of the duplication MAC CE. Nokia think if we restrict the one leg, we may need to discuss switching from CA configurations to MP: Does the UE do something or do we rely on gNB implementation?

Apple think there is a little spec impact, as already captured in the running CR. vivo have a similar understanding.

OPPO think we would need a UE capability.

ZTE think some further checking on potential impact would be needed. They think RAN3 have assumed only two legs.

Xiaomi think it can be supported only if there is no spec impact, including no UE capability.

vivo ask about the ZTE comment: What is the potential impact in RAN3? ZTE think RAN3 have assumptions on the number of RLC entities and there could be impact on CU-DU interaction.

LG think the RAN3 issue is not new and they can design based on our existing CA functionality; they see limited spec impact to us. Nokia have the same understanding, and they think companies can coordinate internally about any RAN3 issues.

Samsung agree with LG and Nokia; they see no big issues in RAN3.

Agreement:

More than one leg (i.e., CA configuration with 2 or 3 legs) on direct Uu path in MP is supported. Capability for this feature to be discussed under the general capability discussion.

Open issues documents

[R2-2311858](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2311858_%20RRC%20Open%20issues%20for%20U2U%20relay.docx) RRC Open issues for U2U relay vivo other Rel-18 NR\_SL\_relay\_enh-Core

[R2-2312095](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312095_U2U%20relay%20proposals%20for%20stage-3%20issues.docx) U2U relay proposals for stage-3 issues vivo discussion

[R2-2311880](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2311880%20-%20SRAP%20open%20issues%20for%20R18%20sidelink%20relay.docx) SRAP open issues for R18 sidelink relay OPPO other Rel-18 NR\_SL\_relay\_enh-Core

[R2-2311971](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2311971%20RRC%20open%20issues%20for%20Rel-18%20Multi-path%20(Outcome%20of%20%5bPost123bis%5d%5b417%5d%5bRelay%5d).docx) RRC open issues for Rel-18 Multi-path (Outcomes of [Post123bis][417][Relay]) Huawei, HiSilicon report Rel-18 NR\_SL\_relay\_enh-Core

[R2-2312018](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312018-Stage%202%20Draft%20CR%20Open%20Issues.docx) Stage 2 Open Issues LG Electronics Inc. other Rel-18 NR\_SL\_relay\_enh-Core

[R2-2312180](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312180%20summary%20PDCP%20open%20issues.docx) Summary of [Post123bis][415][Relay] Rel-18 relay PDCP Identified open issues (InterDigital) InterDigital discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2312181](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312181%20PDCP%20open%20issues%20for%20Rel-18%20Relay.docx) PDCP Open Issues for Rel-18 Relay InterDigital discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2312507](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312507%20Remaining%20open%20issues%20for%20service%20continuity.docx) Remaining open issues for service continuity MediaTek Inc. report Rel-18

* Open issues documents are noted

UE capabilities

[R2-2312695](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312695%20UE%20capability%20for%20sidelink%20relay%20enhancement.doc) UE capability for sidelink relay enhancement Samsung discussion Rel-18 NR\_SL\_relay\_enh-Core

Proposal 1. RAN2 to confirm to reuse relayUE-Operation-L2-r17 for indicating the support of L2 U2U relay UE operation and to reuse remoteUE-Operation-L2-r17 for indicating the support of L2 U2U remote UE operation.

Discussion:

Samsung think there is some potential for confusion between Rel-17 and Rel-18 capabilities.

Nokia think U2U and U2N capabilities are independent; they can imagine a UE that supports U2U but not U2N or vice versa. ZTE also prefer to have separate capability indications. Qualcomm agree.

Proposal 2. RAN2 to confirm to reuse L3 sidelink relay UE operation for UE which supports L3 U2U relay UE operation and to reuse L3 sidelink remote UE operation for UE which supports L3 U2U remote UE operation.

Proposal 3. RAN2 to confirm that the capability parameters of U2U relay UE operation and U2U remote UE operation are not signalled to peer UE.

Discussion:

Qualcomm think we should clarify that this is for AS capability.

Proposal 4. RAN2 to confirm that U2U relay discovery capability is common to L3 U2U relay and L2 U2U relay, discovery models A/B and integrated discovery, and remote UE and relay UE.

Discussion:

Qualcomm wonder about models A and B, because they may cause different behaviour in AS layer.

OPPO understand that in legacy operation, we have only capabilities for communication and discovery.

Qualcomm wonder if we need a capability for U2U relay discovery.

OPPO wonder about integrated discovery, which seems tied to the communication capability for the DCR message.

Xiaomi are concerned about a UE that does not support integrated discovery.

Proposal 5. RAN2 to discuss to reuse the band combination list defined for Rel-17 NR Relay discovery as an indication for the support of U2U relay discovery.

Proposal 6. RAN2 to confirm that existing UE capability parameters of Release 17 L2 U2N relaying can be reused and no additional UE capability parameter is needed for Release 18 L2 U2N relay service continuity.

Proposal 7. RAN2 to define new two UE capability parameters to indicate the support of multi-path relaying via L2 U2N relay and to indicate the support of multi-path relaying via non-3GPP connection.

Proposal 8. RAN2 to confirm that the two UE capability parameters on multi-path relaying are signalled only to gNB.

Proposal 9. RAN2 to confirm to reuse L3 sidelink relay UE operation and L3 sidelink remote UE operation for UE which support multi-path relaying via L3 U2N relay.

Proposal 10. RAN2 to discuss whether the support of RRC\_IDLE/RRC\_INACTIVE target Relay UE for indirect path addition/change in MP scenario 1 is based on UE capability.

Proposal 11. If MP relay indirect path addition/change to an IDLE/INACTIVE target Relay UE is a UE capability, RAN2 to discuss whether to reuse the capability flag of Rel-17 U2N relay i.e., remoteUE-PathSwitchToIdleInactiveRelay-r17.

Proposal 12. RAN2 to confirm that existing UE capability parameters of Release 17 sidelink DRX can be reused and no additional UE capability parameter is needed for Release 18 SL DRX.

Agreements:

Separate capabilities for U2U and U2N relay functionality (for both remote and relay UEs, for L2 and L3).

Capability parameters of U2U relay UE operation and U2U remote UE operation are not signalled to peer UE in the AS capability.

A single new U2U relay discovery AS capability is common to L3 U2U relay and L2 U2U relay, discovery models A/B and integrated discovery, and remote UE and relay UE.

Integrated discovery requires AS capabilities for both U2U relay discovery and communication. No separate AS capability for integrated discovery; a UE that supports U2U relay discovery and communication is required to support integrated discovery from AS layer perspective.

* [AT124][407][Relay] Relay UE capability (Samsung)

Scope: F2F offline to progress major issues on Rel-18 relay UE capability (including the capability for multiple Uu legs in MP).

Intended outcome: Report to CB session in R2-2313793

Schedule: Tuesday 2023-11-14 1100-1130 in Brk3

Deadline: Wednesday 2023-11-15 1900 CST

[R2-2313793](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Inbox\R2-2313793.zip) [AT124][407] Relay UE capability Samsung discussion Rel-18 NR\_pos\_enh2

Proposal 1: To indicate UE capability for band combination for U2U relay discovery message, RAN2 will select one option between Alt 1 and Alt 2 with consideration of signaling overhead impact.

(Alt 1)

Use combination of “supportedBandCombinationListSL-RelayDiscovery-r17/supportedBandCombListPerBC-SL-RelayDiscovery-r17” capability parameter and U2U relay discovery AS capability parameter

For this option, how NW can know if UE supports only U2U relay discovery needs to be clarified.

(Alt 2)

Define separate BC list for U2U relay discovery

Proposal 2: To indicate the support of R18 U2N relay service continuity, define separate capability parameter for R18 L2 U2N remote UE.

Proposal 3: new separate UE capability parameters on multi-path capability will be defined to indicate the support of multi-path relaying via L2 U2N relay and to indicate the support of multi-path relaying via non-3GPP connection.

Proposal 4: The separate UE capability parameters on multi-path capability are signaled only to gNB.

Proposal 5: For MP scenario 2, the need of relay UE’s capability can be further discussed.

Discussion:

Samsung think a new capability makes sense.

Proposal 6: To indicate the support of RRC\_IDLE/RRC\_INACTIVE target Relay UE for indirect path addition/change in MP scenario 1, define a separate UE capability parameter.

Proposal 7: To indicate the support of 1 Uu leg only for MP or the support of more than 1 Uu legs for MP, RAN2 will select one option between Alt 1 and Alt 2

(Alt 1) Define separate UE capability to indicate the support of more than 1 Uu legs for MP relay

(Alt 2) Use existing Uu capability for PDCP duplication (1-leg/2-leg/3-leg) with combination of multi-path capability

Discussion:

Xiaomi understand that 3 legs can be achieved by combining PDCP duplication on Uu with MP. Nokia think it is a bit complicated and it would be clearer to have a new capability. OPPO think it would be simpler to use a new capability. Apple think the exception to the existing capabilities would be a corner case. Qualcomm think there are other cases of feature combination with MP, and they wonder if we would introduce new capabilities for everything.

Samsung think there may be some cases where a new capability is needed, but the number may not be very high.

Proposal 8: No additional UE capability is needed. Existing UE capability parameters of Release 17 sidelink DRX can be reused.

Proposal 9: Clarify E2E UE capability transfer AS layer procedure in the figure in L2 U2U relay in stage 2 CR (R2-2312029, Figure 16.12.x-1: Procedure for L2 U2U Remote UE connection establishment)

Agreements:

To indicate the support of R18 U2N relay service continuity, define separate capability parameter for R18 L2 U2N remote UE.

New separate UE capability parameters on multi-path capability will be defined to indicate the support of multi-path relaying via L2 U2N relay and to indicate the support of multi-path relaying via non-3GPP connection.

The separate UE capability parameters on multi-path capability are signaled only to gNB.

Introduce a capability for functioning as a relay UE in MP scenario 2.

To indicate the support of RRC\_IDLE/RRC\_INACTIVE target Relay UE for indirect path addition/change in MP scenario 1, define a separate UE capability parameter.

No additional UE capability is needed. Existing UE capability parameters of Release 17 sidelink DRX can be reused.

Clarify E2E UE capability transfer AS layer procedure in the figure in L2 U2U relay in stage 2 CR (R2-2312029, Figure 16.12.x-1: Procedure for L2 U2U Remote UE connection establishment)

Define separate BC list for U2U relay discovery in the ASN.1 as a baseline. Overhead issues can be further discussed in maintenance.

Define separate UE capability to indicate the support of more than 1 Uu legs for MP relay as a baseline. Potential to combine with existing capabilities can be discussed in maintenance.

Withdrawn/Not available

[R2-2312017](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312017-Rel-18%20relay%20stage%202%20draft%20CR.doc) Draft running CR 38.300 LG Electronics Inc. draftCR Rel-18 38.300 17.6.0 B NR\_SL\_relay\_enh-Core

* Withdrawn

Agreement:

Rel-18 relay work item is complete from RAN2 point of view.

### 7.9.2 UE-to-UE relay

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

P1-P6, P13-P24, subject to time constraints

[R2-2311877](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2311877%20-%20Discussion%20on%20control%20plane%20procedure%20of%20U2U%20Relay.docx) Discussion on control plane procedure of U2U relay OPPO discussion Rel-18 NR\_SL\_relay\_enh-Core

Proposal 1 Define separate threshold parameters for U2U Relay (re)selection on top of those for U2N Relay.

Proposal 2 Upon reception of NotificationMessageSidelink indicating PC5-RLF from the U2U relay UE, it is up to U2U Remote UE ProSe layer implementation to decide whether to keep or release the PC5 link with the relay UE.

Discussion:

Qualcomm want to confirm that it is also up to upper layer whether to keep the e2e connection.

vivo think the remote UE should keep the link with the relay UE if it is shared with another peer remote UE, so they wonder if this should be captured. Apple have a similar understanding.

CATT think the shared case can also be left to implementation.

OPPO agree with CATT; relay reselection is handled by upper layer, so if there is another e2e link, the upper layer can take that into account.

Qualcomm think we can capture releasing the relay context for this remote UE instead.

Nokia think this is an upper layer issue. NEC agree, and they wonder what the “relay context” mentioned by Qualcomm is.

[End-to-end case]

Huawei note that in legacy communication, link failure results in the AS layer releasing the PC5-RRC connection and notifying upper layers.

Qualcomm think it should be possible to keep the e2e connection and do relay reselection.

Ericsson think the e2e link should be released because there is no access to the peer remote UE.

OPPO think PC5-RRC should be released as in legacy.

vivo think if we follow legacy, we should release the e2e link and potentially establish a new one.

Lenovo also think we should release the e2e link since there is no service continuity at relay change. LG agree and see the use of a new relay as creating a new link.

Proposal 3 Allow triggering of U2U Relay selection if the SL-RSRP and SD-RSRP measurement of the peer NR sidelink U2U Remote UE are unavailable”.

Discussion:

CATT wonder how to identify this case; they agree that relay selection can be triggered, but they think this can be done by upper layers and no AS requirement is needed.

OPPO indicate that in the current RRC running CR, there are some AS conditions on triggering relay selection, and if we do not include this case it will prevent the UE from triggering relay selection.

LG wonder if this relates to the case where the source and target remote UE are already connected, and in such a case they understand that the PC5 degradation can already trigger selection.

Nokia have a similar understanding to CATT that upper layers should trigger it.

Qualcomm think we do not need to specify this case.

ZTE understand that if the UEs already have a direct link, the link degradation will trigger relay selection, but if there is no link and the source UE can detect the discovery message at a very low RSRP, the remote UE should be able to trigger relay selection. vivo agree with ZTE and think the current running CR will cover this case.

Xiaomi understand that the decision should be made in upper layers, not AS layers.

Apple and NEC have some doubt if the link is needed in this case. OPPO agree; they intended for the proposal to address only the case where the measurement result is unavailable, not to introduce a new AS condition.

Proposal 4 Relay UE does not forward AS link quality degradation of one hop to the peer remote UE of the other hop.

Discussion:

LG think it can be considered by the peer remote UE. Apple have a similar view.

Qualcomm agree with the proposal; we allow both remote UEs to perform reselection, and they think that addresses the issue.

Kyocera agree with LG. InterDigital also agree.

NEC agree with the proposal and think if the link quality is poor enough, the peer remote UE will trigger relay reselection. vivo agree.

ZTE agree with LG and others; they think it allows the peer remote UE to trigger relay reselection more efficiently.

Nokia agree with Qualcomm and NEC and consider the forwarding as an optimisation.

LG think the measurement value can be different as seen by the two UEs.

Lenovo agree with LG and ZTE.

Huawei think the forwarding is beneficial.

OPPO think it is kind of an optimisation, and they do not see why forwarding this information will trigger early reselection, since the peer UE is the one that can identify the link degradation and it can already trigger reselection expediently. To LG’s comment on the measurement value, they understand this is a different mechanism which we have not discussed.

Qualcomm indicate that upper layers already specify that the source will send multiple candidate relays to the peer remote UE.

Chair thinks this is not a killer issue and we do not have consensus to introduce it. CATT agree.

Proposal 5 RAN2 does not pursue defining direct link unreachability as an AS-layer trigger for indirect to direct switching.

Proposal 6 Besides the AS layer trigger for U2U relay reselection, RAN2 not pursue additional AS-layer spec impact for relay reselection, but just rely on the higher layer procedure defined by SA2.

Proposal 13 RAN2 confirm that network will not provide dedicated SLRB configurations (including configuration for both end-to-end layers and per-hop layers) to RRC CONNECTED UE for the U2U service.

Discussion:

Samsung are OK to follow the legacy, in which the gNB can be involved when the UE is in RRC\_CONNECTED.

ZTE understand it includes both L2 and L3, and for L3, the gNB is not aware of the potential service and can still use the legacy mechanism to configure the SLRB, so in that case they think dedicated configuration should be allowed. They agree that some additional work may be needed for L2, but they see it as worthwhile.

InterDigital think looking at the legacy operation, the network is involved with the links, and this proposal would change it.

Apple think SLRB configuration is general to many services and it is not clear if we need something special for U2U.

Xiaomi understand that if we follow the Rel-16 framework, the network can configure dedicated SLRB configurations, and they think we should follow this.

NEC tend to agree with Xiaomi and see a relation to ID reporting.

Qualcomm think involving the gNB requires an enhancement, because it would require reporting e2e QoS information to the gNB.

Apple think the point is that the current RRCReconfiguration does not have information specific to e2e, so there would be signalling impact to support dedicated configuration for U2U.

vivo think the remote UE can report the split QoS to the gNB and the gNB can configure the per-hop bearers, but e2e configurations are not needed.

Ericsson are OK with the proposal, and they wonder what the gNB would do to determine an appropriate configuration; they see that the UE can do this itself. They also want to avoid opening up complexities from partial-coverage cases.

OPPO think the hop-by-hop and e2e cases cannot be split since they have to be compatible with each other. Huawei agree with OPPO.

Samsung think the hop-by-hop configuration needs gNB involvement.

Huawei think the network needs to provide the RLC channels for mode 1, and they prefer the reverse of the proposal.

InterDigital do not see an issue with the network providing the configurations; the UE will still provide the QoS to the network in the SUI as usual, the network is aware that this is relaying because of authorization, and they see that legacy operation works.

Qualcomm note that it is the last meeting and doubt if it is feasible to add a new solution for this, so they would prefer to take the proposal and rely on SI/preconfiguration. LG have the same understanding and think we need to prioritize completion.

vivo think if we do not allow dedicated configuration for hop-by-hop, we diverge from legacy.

InterDigital wonder about UE behaviour if it changes between direct link and U2U while in RRC\_CONNECTED. Qualcomm understand there is no service continuity in such cases.

LG think we could discuss it in maintenance.

Huawei wonder how we will make sure that the network knows the UE is performing U2U communication; they see that enhancements to the SUI will be needed.

OPPO see some spec impact in either case, and if we rely on dedicated configuration, they see impact to the RRCReconfiguration; however, they see a majority of companies wanting to maintain the legacy operation.

Ericsson would like to understand the spec impact: They anticipate that the UE would report in SUI the destination, and the network would configure the SLRBs as legacy, with no major spec impact. Qualcomm understand that the enhancement is reporting of both e2e and hop-by-hop QoS, followed by the network providing e2e and hop-by-hop configuration. NEC do not see this as an enhancement and they think the ASN.1 impact is minimal.

Huawei understand in legacy, the remote UE can report two sets of QoS parameters, one per destination ID, but now it needs to report them associated with each other so the network can provide a consistent configuration.

Ericsson wonder about differentiated handling in the network; what is the network really expected to do differently?

Proposal 14 For OOC/RRC\_IDLE/RRC\_INACTIVE/CONNECTED L2 U2U Remote UE, PDCP/SDAP setting for E2E SLRB is obtained via Pre-configuration/SIB by only referring to end-to-end QoS as in legacy.

Proposal 15 For OOC/ RRC\_IDLE/ RRC\_INACTIVE/CONNECTED L2 U2U Remote UE, SRAP/RLC/MAC setting for E2E SLRB is obtained via Pre-configuration/SIB by only referring to end-to-end QoS as in legacy.

Discussion:

OPPO understand that the difference between e2e and hop-by-hop is PDB, so the question here is really whether we need to consider the split PDB to configure the lower layers.

Qualcomm think the PDB is useful for the reTx number and polling timer. Xiaomi also think PDB should be considered for the hop-by-hop configurations.

Samsung agree with OPPO and think the PDB will not impact the lower layer parameters. They think reTx number is more a function of reliability.

OPPO wonder if companies wanting to use per-hop QoS want to introduce additional configurations. Qualcomm think we can reuse the existing configuration signalling for SI, and they continue to think that PDB can impact the reTx number. OPPO thought we would need an additional configuration in SI to take into account both QoS settings.

Proposal 16 The Tx Remote UE informs the flow-to-SLRB mapping (i.e., SDAP configuration) to the relay UE via PC5-RRC.

Proposal 17 The Tx Remote UE informs the SLRB configuration index (i.e., slrb-PC5-ConfigIndex) to the relay UE via PC5-RRC.

Discussion:

Apple wonder if P16 is really necessary since the relay UE will not see the QoS flow.

Xiaomi support P16 and think P17 is already existing behaviour.

Proposal 18 RAN2 to confirm in L2 U2U Relay, network implementation would ensure the SDAP (pre-)configuration of cell/coverage-boundary would be always compatible.

Proposal 19 For figure 16.12.x-1 in stage-2 running CR, RRCReconfigurationSidelink in step 8a/b cannot be merged in the per-hop PC5-RRC connection establishment procedure, the Editor’s NOTE can be removed directly.

Proposal 20 RAN2 to discuss capture “Communication resource pool is used for the DCR/DCA message with integrated-discovery.” in section 5.8.13.3 NR sidelink discovery transmission by additional restriction on integrated DCR cannot use the discovery dedicated pool.

Proposal 21 Remove “determine the submission of an xxx message to xxx” in clauses 5.8.9.1.2 and 5.8.9.1.9 for the transmission of RRCRconfigurationSidelink/ RRCRconfigurationSidelinkComplete.

Proposal 22 Introduce indication(s) for the network capability on U2U service in SIB message.

Proposal 23 RAN2 discuss how for L2/L3 U2U relay and remote UE to report communication/discovery traffic via SUI to network.

Proposal 24 In L2 U2U Relay, U2U Remote UE does not report E2E PC5-RLF with the peer remote UE to network.

Agreements:

Define separate threshold parameters for U2U Relay (re)selection on top of those for U2N Relay.

Upon reception of NotificationMessageSidelink indicating PC5-RLF from the U2U relay UE, it is up to U2U Remote UE ProSe layer to decide whether to keep or release the PC5 link with the relay UE.

Upon reception of NotificationMessageSidelink indicating PC5-RLF from the U2U relay UE, the U2U Remote UE AS layer releases the PC5-RRC connection with the peer U2U Remote UE and notifies upper layers.

Relay UE does not forward AS link quality degradation of one hop to the peer remote UE of the other hop.

For OOC/RRC\_IDLE/RRC\_INACTIVE L2 U2U Remote UE, PDCP/SDAP setting for E2E SLRB is obtained via Pre-configuration/SIB by only referring to end-to-end QoS as in legacy.

The Tx Remote UE informs the flow-to-SLRB mapping (i.e., SDAP configuration) to the relay UE via PC5-RRC.

The Tx Remote UE informs the SLRB configuration index (i.e., slrb-PC5-ConfigIndex) to the relay UE via PC5-RRC.

* [AT124][408][Relay] Dedicated configuration for U2U relay SLRBs (OPPO/Qualcomm)

Scope: F2F offline to:

* evaluate the spec impact of supporting/excluding dedicated configuration for U2U relay SLRBs for RRC\_CONNECTED remote UEs, and converge on a solution if possible based on the level of spec impact.
* evaluate the use of e2e/hop-by-hop QoS and SLRB configurations for idle/inactive/OOC remote UEs

Intended outcome: Report to CB session in R2-2313807

Schedule: Wednesday 2023-11-15 1430-1500 in Brk3

Deadline: Thursday 2023-11-16 1000 CST

[R2-2313807](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2313807%20-%20Summary%20of%20%5bAT124%5d%5b408%5d%5bRelay%5d.doc) Summary of [AT124][408][Relay] OPPO discussion Rel-18 NR\_pos\_enh2

Proposal 1 Rely on dedicated SLRB configuration for RRC\_CONNECTED UE

Proposal 2 For RRC\_IDLE/RRC\_INACTIVE/OOC UE, Tx UE merge the per-flow QoS (for the flows, if there are more than one flow, of the same bearer), including PDB which is split-PDB besides other QoS parameters, into a per-bearer QoS for RLC/MAC configuration derivation, where the merging operation is up to UE implementation. No additional PC5-RRC signaling impact due to this solution.

Discussion:

LG wonder how the merge of QoS parameters will be performed. OPPO understand that companies want to leave this to UE implementation as in P2.

Apple agree with OPPO and think it would be difficult to specify a set of rules for merging the QoS profiles.

Agreements:

Rely on dedicated SLRB configuration for RRC\_CONNECTED UE

For RRC\_IDLE/RRC\_INACTIVE/OOC UE, Tx UE merge the per-flow QoS (for the flows, if there are more than one flow, of the same bearer), including PDB which is split-PDB besides other QoS parameters, into a per-bearer QoS for RLC/MAC configuration derivation, where the merging operation is up to UE implementation. No additional PC5-RRC signaling impact due to this solution.

* [AT124][409][Relay] QoS aspects for U2U (vivo)

Scope: F2F offline to discuss additional QoS topics (P6-P14 of R2-2312094) as time permits.

Intended outcome: Report to CB session in R2-2313808

Schedule: Wednesday 2023-11-15 1500-1530 in Brk3

Deadline: Thursday 2023-11-16 1000 CST

[R2-2313808](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2313808%20-%20Summary%20of%20%5bAT124%5d%5b409%5d%5bRelay%5d%20QoS%20aspects%20for%20U2U%20(vivo).doc) Summary of [AT124][409][Relay] QoS aspects for U2U (vivo) vivo discussion Rel-18 NR\_pos\_enh2

Proposal 1: For split of QoS, only support to split PDB for U2U relay. For other QoS parameters, source remote UE uses the parameters in e2e QoS profiles for the first hop configuration.

Proposal 2: Relay UE uses split PDB and other QoS parameters in e2e QoS profiles for the second hop configuration.

Proposal 3: The split PDB value is not delivered to the peer L2 U2U Remote UE.

Discussion:

Xiaomi think we could use the source/target terminology as in P1 and P2.

OPPO agree with the concept of the proposal but think we could say “peer UE of the second hop” rather than source/target. vivo indicate that the running CR always uses source/target.

Proposal 4: RAN2 to down-select from the following two options for how to carry e2e QoS and split PDB:

- Option 1: Reuse RRCReconfigurationSidelink (for carrying e2e QoS) and RRCReconfigurationCompleteSidelink (for carrying split PDB), FFS the failure case when RRCreconfigurationSidelink is failed and then how the relay UE can send split QoS to source remote UE

- Option 2: Introduce two new PC5-RRC messages, one for source remote UE to send e2e QoS to relay UE, the other one for relay UE to send split PDB to source remote UE.

Discussion:

vivo feel that option 1 has more concerns about reuse of the messages for a different purpose, so they think we could try to agree on option 2.

CATT think option 1 may be misunderstood; they interpret that we would use legacy PC5-RRC signalling, but not necessarily these specific messages for all cases. They do not see a big motivation to introduce new messages.

Apple support option 2; they understand that the legacy messages can be used for multiple purposes at once, and including the QoS information could cause partial failure cases. CATT agree they can be used for multiple purposes, and they think failures can be correctly indicated by the existing failure messages.

OPPO agree with Apple and would like to avoid the need to discuss the failure case.

LG think both options will work; in Uu operations we use RRCReconfiguration for multiple purposes, and failure is handled case by case, so they think option 1 can work.

Qualcomm also prefer option 1 and think the reconfiguration can be used for multiple purposes; as LG said, on Uu we handle failures for multiple operations in a single reconfiguration.

OPPO consider that RRCReconfiguration is to send parameters to the peer UE, while the QoS operation is to ask the peer UE to help with the split, so they see the purposes as different. For the failure case, they think the QoS split may need to be fed back in the failure message as well as the complete message.

vivo think the failure case is likely to mean that the QoS split occurred before the failed parameter setting.

InterDigital agree with Apple and OPPO; they think the Tx UE will use a separate transmission of the reconfiguration message just to split the QoS, to avoid ambiguous failure cases, and in this case the message might as well be separate.

Apple think including the split in the failure message is weird, because it means the failure message contains parameters that the receiver has to apply. They also think two responses is not feasible.

Qualcomm wonder if we can leave it to CR implementation.

vivo think option 1 could be done, with a failure meaning falling back to the previous configuration.

Xiaomi think it depends on whether we allow the recipient to reject the split. If it is allowed, they think the reconfiguration makes sense, otherwise a new message.

Xiaomi think option 2 can be done with only one new message, because the split cannot fail. OPPO think there needs to be a transaction ID as well as the split result.

Proposal 5: RAN2 to have more time to check and further discuss if the mapping configuration (from e2e SLRB to RLC channel) is needed in SIB12/pre-configuration.

Discussion:

Ericsson think we do not need this configuration in SIB12; the relay UE can figure it out.

Qualcomm think we may need to clarify that for a U2U relay case, the RLC channel configuration is for relaying.

OPPO would like to understand if there is an intention to reuse the legacy SIB12 and preconfiguration tables or define them anew. Qualcomm think we do not need to introduce new ones, but we may need some indication of relaying applicability.

OPPO understand that if we use the existing table, it will be a new use of the table, and it may be difficult to clarify in the spec, so they somewhat prefer to use new tables. Apple also feel a new table would be cleaner, because of the need to map to two levels of bearers. InterDigital agree.

Huawei think we already described the UE behaviour for RRC\_CONNECTED, and it seems strange to do it differently for idle/inactive.

OPPO understand that the existing table starts from QoS info and includes all layers in order, and using it for U2U would require using it first with e2e QoS for the upper-layer configurations, ignoring RLC and MAC, and then with the hop-by-hop QoS for the RLC and MAC configurations only. They think it would be clearer to have a new table.

Huawei want to clarify that the UE behaviour to derive the QoS would be the same, and the output from the table is the whole configuration.

Qualcomm wonder if the table includes only bearer/RLC channel mapping or also the RLC channel configurations. OPPO understand it should have e2e QoS as the input and SDAP/PDCP configurations as the output, along with hop-by-hop QoS as an input and RLC channel configurations as the output.

Huawei think if we need two tables, it is similar to legacy.

Nokia note that the SIB size is limited and it is a precious resource, so we should target keeping the tables compact. They would prefer to optimize for SIB size even at the cost of implementation complexity.

OPPO think we should avoid a lot of UE complexity as well, and they note that we already have introduced SIB segmentation to deal with large SIBs.

Huawei understand the concern from both sides and prefer to use the existing table.

Apple think we could start with the existing table and see if there is a problem. LG agree.

Proposal 6: Both e2e QoS and split QoS are needed in SUI to source remote UE’s gNB. Further to discuss the signaling in running CR discussion, e.g. whether it is in a single entry in SUI message or two entries in SUI messages, whether separate list is needed.

Discussion:

OPPO wonder if we could identify a baseline on the SUI implementation. Apple think there is a related MAC open issue on single or separate lists in SUI.

LG think for the CR implementation we could use two entries as the baseline.

OPPO think a single list is cleaner, and for the entries, they wonder if two separate entries for e2e and split QoS would need to be associated for the network.

Ericsson think we should leave this discussion to the rapporteur and it is something of a matter of taste.

Xiaomi wonder what the need to associate the e2e and split QoS is, considering that it is up to the UE to merge the QoS. OPPO indicate that for the RRC\_CONNECTED UE, the network will provide the PDCP/RLC configurations and association, so it needs to know which peer remote UE is associated with which relay UE. Xiaomi understand the UE has already provided the needed QoS information in the SUI.

OPPO consider that the network needs to know which e2e bearer is going to be included in which RLC channel, so they see that an association between the remote and relay UEs is needed.

Proposal 7: Relay UE to report second hop QoS profile and target remote UE ID in SUI to gNB as in legacy. And down-select from:

- Option-1: Relay UE report merged QoS to gNB

- Option-2: Relay UE report the per-flow QoS+ SDAP configuration (from source remote UE) to gNB

Discussion:

CATT think both options are reasonable but slightly prefer option 1. vivo agree. Qualcomm also agree.

Agreements:

For split of QoS, only support to split PDB for U2U relay. For other QoS parameters, source remote UE uses the parameters in e2e QoS profiles for the first hop configuration.

Relay UE uses split PDB and other QoS parameters in e2e QoS profiles for the second hop configuration.

The split PDB value is not delivered to the second-hop peer L2 U2U Remote UE.

Implement the RRC CR with two new PC5-RRC messages, one for source remote UE to send e2e QoS to relay UE, the other one for relay UE to send split PDB to source remote UE. Whether this message arrangement is optimal can be discussed in maintenance.

Both e2e QoS and split QoS are needed in SUI to source remote UE’s gNB and need to be associated with one another. Further to discuss the signaling in running CR discussion, e.g. whether it is in a single entry in SUI message or two entries in SUI messages, whether separate list is needed.

Relay UE to report second hop QoS profile and target remote UE ID in SUI to gNB. Relay UE reports the per-SLRB second-hop QoS profile (i.e., a list of SLRB-specific e2e QoS entries, with PDB replaced by the split PDB, along with an ID for the network to use to provide the SRAP configuration) to gNB. Signalling details can be discussed in the running CR finalisation.

The mapping configuration (from e2e SLRB to RLC channel) is needed in SIB12/pre-configuration. The existing table format is used as a baseline, subject to discussion during maintenance. The related editor’s note can be kept.

P5-P10

[R2-2312416](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312416%20Disussion%20on%20U2U%20Relay.docx) Discussion on U2U Relay CATT discussion Rel-18 NR\_SL\_relay\_enh-Core

Proposal 5: BEARER ID is set to the LSB 5 bits of PC5 configuration index.

Discussion:

Apple agree the configuration index can be used, but they think it will be the same number in the LSBs and the configuration index itself. They understand that the range of the index is actually 0..31 even though the field is wider.

vivo note that the index is 1..32, not 0..31, so it should be either the 5 LSBs or (configuration index - 1).

Proposal 6: Confirm the working assumption that Carry L2 ID and Local ID in RRCReconfigurationSidelink message with the assumption that the association between User Info and L2 ID is done at ProSe layer.

Proposal 7: RAN2 revise the last meeting’s agreement for PC5-RLF indication as below:

RAN2 confirm the following agreement applies to both source L2 remote UE and L2 target remote UE.

- 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 (re)selection (or not).

Proposal 8: RAN2 confirm the following agreement applies to both source L3 remote UE and L3 target remote UE.

- 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).

Discussion:

Qualcomm think we do not need to do anything for the L3 case because the relay UE will release the connection and the peer UE will trigger relay reselection.

Proposal 9: In case that there is no SL-RSRP/SD-RSRP measurement of the peer remote UE available, the remote UE can be triggered to perform relay selection which is left to UE implementation.

Proposal 10: The U2N relay selection parameter is not reused to U2U relay selection.

Agreements:

Confirm the working assumption to carry L2 ID and Local ID in RRCReconfigurationSidelink message with the assumption that the association between User Info and L2 ID is done at ProSe layer. If SA2 come back with a different conclusion, it can be handled in maintenance.

The following previous agreement does not apply to the L3 case (there is no PC5-RLF indication in this case):

- 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).

BEARER ID is set to the 5 LSBs of PC5 configuration index. Range definition between 4..31 vs. 5..32 to be checked in CR implementation.

P6-P14 if time (potentially offline)

[R2-2312094](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312094_Remaining%20issues%20on%20L2%20U2U%20relay.docx) Remaining issues on L2 U2U relay vivo discussion

Proposal 6: Whole Split QoS Profiles, e.g. in term of SL-QoS-Info-r16, are sent to the source Remote UE from the Relay UE. And it is left to Relay UE implementation on how to set the value of each QoS parameter in the Split QoS Profiles.

Proposal 7: The split QoS value doesn’t need to be delivered to the peer L2 U2U Remote UE, i.e. choosing the above Option-1.

Proposal 8: RRCReconfigurationSidelink and RRCReconfigurationCompleteSidelink are reused to deliver E2E QoS profile and split QoS profile between source L2 U2U remote UE and relay UE respectively.

Proposal 9: For an IDLE/INACTIVE/OOC source remote UE, E2E QoS profile should be used to decide E2E SLRB configuration and split QoS profile for RLC channel configuration of the first hop based on the configuration from SIB or pre-configuration. And it is up to source remote UE implementation to aggregate different E2E SLRBs with same/similar RLC channel configuration into one RLC channel.

Proposal 10: For a CONNECTED source remote UE, split QoS profile of the first hop should be reported to its serving gNB. Then legacy SLRB configuration & RLC bearer configuration of this hop (i.e., SL-RadioBearerConfig and SL-RLC-BearerConfig) are configured to source remote UE by gNB.

Proposal 11: For a CONNECTED source remote UE, it’s up to source UE implementation to derive each E2E SLRB with different target remote UE(s) based on configured SL RB configuration & RLC bearer configuration.

Proposal 12: For an IDLE/INACTIVE/OOC relay UE, split QoS profile and potential E2E SLRB configuration should be used to decide RLC channel configuration of the second hop from SIB or pre-configuration. And it is up to relay UE implementation to aggregate different E2E SLRBs with same/similar RLC channel configuration into one RLC channel.

Proposal 13: For a CONNECTED relay UE, split QoS profile of the second hop should be reported to its serving gNB. Then legacy RLC bearer configuration and SLRB configuration are configured to relay UE by gNB.

Proposal 14: For a CONNECTED relay UE, it’s up to relay UE implementation to derive mapping relationship between E2E SLRB and RLC channel based on configured SLRB configuration & RLC bearer configuration from gNB and E2E SLRB configuration from source remote UE.

[R2-2311878](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2311878%20-%20Discussion%20on%20user%20plane%20procedure%20of%20U2U%20Relay.docx) Discussion on user plane procedure of U2U relay OPPO discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2311990](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2311990+Remaining%20issues%20for%20L2%20U2U%20relay.doc) Remaining issues for L2 U2U relay China Telecom discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2312007](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312007%20Discussions%20on%20U2U%20relay.doc) Discussion on U2U relay Fujitsu discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2312173](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312173%20(R18%20SL%20Relay%20WI_AI792%20U2U%20Relays_OpenIssues).doc) Open Issues on UE-to-UE Relays InterDigital discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2312220](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312220%20Discussion%20on%20L2%20ID%20reporting%20of%20U2U%20relay.docx) Discussion on L2 ID reporting of U2U relay NEC discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2312222](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312222-U2U-multi.docx) U2U relaying considering multi-hop Sharp discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2312338](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312338%20Discussion%20on%20U2U%20relay%20issues.doc) Discussion on remaining issues on UE-to-UE Relay Apple discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2312426](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312426_Discussion%20on%20the%20gNB%20involvement%20in%20U2U%20relay.doc) Discussion on the gNB involvement in U2U relay ZTE, Sanechips discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2312427](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312427_Discussion%20on%20remaining%20issues%20on%20U2U%20relay.doc) Discussion on remaining issues on U2U relay ZTE, Sanechips discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2312434](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312434%20Discussion%20on%20remaining%20issues%20for%20U2U%20relay.docx) Discussion on remaining issues for U2U relay Xiaomi discussion

[R2-2312452](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312452%20Discussion%20on%20L2%20UE-to-UE%20relay%20v1.0.docx) Discussion on L2 UE-to-UE relay Lenovo discussion Rel-18

[R2-2312496](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312496-U2U.docx) Remaining issues for U2U relay Sharp discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2312535](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312535-Our%20views%20about%20open%20issues%20for%20U2U%20relay.docx) Our views about open issues for U2U relay LG Electronics Inc. discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2312567](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312567%20Remaining%20issues%20on%20UE-to-UE%20relay.doc) Remaining issues on UE-to-UE relay Spreadtrum Communications discussion Rel-18

[R2-2312615](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312615%20U2U%20reselection.docx) U2U relay (re)selection issues Nokia, Nokia Shanghai Bell discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2312616](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312616%20U2U%20QoS.docx) E2E RB configuration and QoS split for U2U Relays Nokia, Nokia Shanghai Bell discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2312687](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312687_U2U%20relay%20CR%20update%20for%20stage-3%20issues.docx) U2U relay CR update for stage-3 issues vivo draftCR Rel-18 38.331 17.6.0 B NR\_SL\_relay\_enh-Core R2-2311857

[R2-2312692](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312692%20Discussion%20on%20UE-to-UE%20relay.doc) Discussion on UE-to-UE relay Huawei, HiSilicon discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2312696](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312696%20Control%20plane%20issues%20for%20L2%20U2U%20relaying.doc) Control plane issues for L2 U2U relaying Samsung discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2312697](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312697%20Discussion%20on%20remaining%20issues%20of%20U2U%20relay.docx) Discussion on remaining issues of U2U relay CMCC discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2312842](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312842.doc) UE-to-UE relay (re)selection Sony discussion Rel-18 NR\_SL\_relay\_enh

[R2-2312868](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312868-%20Open%20issues%20on%20U2U%20Relay.docx) Open issues on U2U Relay Qualcomm Incorporated discussion NR\_SL\_relay\_enh-Core

[R2-2312882](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312882_U2U_relay.docx) Considerations for U2U L2 relay operations Kyocera discussion

[R2-2312924](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312924_Discussion_on_Relay_reselection_Discovery.docx) Discussion on Relay (re)selection and Discovery Ericsson discussion Rel-18

[R2-2312925](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312925_Control_Plane_Procedures_for_L2_U2U_relays.docx) Control Plane Procedures for Layer 2 UE-to-UE Relays Ericsson discussion Rel-18

[R2-2313192](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2313192%20Remaining%20issues%20on%20AS%20layer%20configuration%20for%20L2%20U2U%20Relay.docx) Remaining issues on AS layer configuration for L2 U2U Relay ASUSTeK discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2313193](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2313193%20Remaining%20issue%20on%20PC5%20radio%20link%20failure.docx) Remaining issue on PC5 radio link failure ASUSTeK discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2313232](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2313232%20U2U%20triggers%20and%20thresholds.docx) Discussion on U2U relay (re)selection triggers and thresholds Beijing Xiaomi Mobile Software discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2313509](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2313509%20SRAP%20design%20for%20U2U%20sidelink%20relay%20v2.docx) SRAP design for U2U Sidelink Relay: remaining issues Samsung R&D Institute UK discussion

[R2-2313542](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2313542_SL%20Relay_U2U_OpenIssues_FhG.docx) Discussion on (re-)selection criteria for U2U relaying Fraunhofer IIS, Fraunhofer HHI discussion Rel-18 NR\_SL\_relay\_enh, NR\_SL\_relay\_enh-Core

### 7.9.3 Service continuity enhancements for L2 UE-to-network relay

Inter-gNB direct/indirect path switching; intra-gNB indirect/indirect path switching; and inter-gNB indirect/indirect path switching, to be supported by reuse of solutions for the other scenarios.

[R2-2312617](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312617%20Remaining%20issues%20on%20service%20continuity.docx) SL Relay service continuity consideration Nokia, Nokia Shanghai Bell discussion Rel-18 NR\_SL\_relay\_enh-Core

Proposal 1: RAN2 to agree to use Figure 1 and 2 as the baseline for inter-gNB path switching to indirect path.

Proposal 2: RAN2 to agree to allow early RRCReconfiguration message to the remote UE for path switching and to use the target relay UE to assist the remote UE’s inter-gNB path switching.

Proposal 3: RAN2 to discuss the enhancement on relay UE’s RRC connection establishment or resume for the relay UE in RRC\_IDLE/INACTIVE.

Discussion:

Huawei are OK with the figures in P1, but on P2, they think this is not necessary and not aligned with legacy behaviour where the target originates the configuration. They think if there is a concern we could enable CHO.

Samsung think RAN3 will provide the figures for stage 2, so P1 may not be necessary. They think P2 will not actually reduce the delay since there will be additional procedures for context management.

ZTE agree with Samsung on P1 and understand that RAN3 already have a TP. For P2, they think preparation with the relay UE should be performed before sending the path switch command to the remote UE; for P3, they think it is too late for the optimisation.

CMCC agree with ZTE on P1.

Ericsson also think P1 will be covered by RAN3. For P2, they thought there was a related discussion in RAN3 and the remote UE reconfiguration was determined to come first as in Rel-17, but they request confirmation.

LG think P1 will be handled by RAN3. On P2, they wonder what the difference from the normal reconfiguration would be: the contents or just the timing?

[R2-2312926](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312926_Discussion_on_Inter_gNB_Service_Continuity.docx) Discussion on Inter-gNB Service Continuity Ericsson discussion Rel-18

Proposal 1 For inter-gNB d2i and i2i scenarios, the following should be agreed about the paging-based mechanism to transit the target U2N relay UE in IDLE/INACTIVE state to the CONNECTED state:

a. In RRC\_INACTIVE state, RAN2 to confirm that it is up to gNB implementation to page the target U2N relay UE before the path switch command is sent to the remote UE, if the gNB can retrieve the target relay UEs context.

b. In RRC\_IDLE state, RAN2 to not pursue the enhancements required for the paging solution.

Discussion:

Huawei understand that the agreements from last meeting about the PC5-RRC trigger cover inactive as well as idle, and we do not need to look into further enhancements. Again, they think that latency issues could be addressed with CHO.

Qualcomm note that we do not support L2ID-based paging in RRC\_INACTIVE, so we would have some paging impact or need a way for the gNB to map the IDs.

Ericsson clarify the intention is not to exclude other solutions, and they think the L2ID can be mapped to the I-RNTI.

Samsung wonder when ethe relay UE needs to send its source L2ID. Ericsson clarify that the intention is just to require it to be included.

Nokia checked the procedure description and it already says that the field must be present for a relay UE. Xiaomi agree with Nokia, and for P1, they think it is agreeable on condition that the network is able to map the L2ID to I-RNTI.

ZTE understand that the relay UE may report the L2ID to the gNB when in RRC\_CONNECTED, and the ID may subsequently change, so they think the paging is not reliable.

Qualcomm agree with ZTE and think the network could even page the wrong relay UE.

Proposal 2 Consider mandatory reporting of the source L2 ID i.e., sl-SourceIdentityRelayUE in the SidelinkUEInformationNR message.

[R2-2311872](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2311872.docx) Discussion on service continuity Xiaomi discussion

[R2-2312417](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312417%20Further%20Consideration%20on%20Service%20Continuity%20Enhancements.docx) Further Consideration on Service Continuity Enhancements CATT discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2312428](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312428_Remaining%20issues%20on%20service%20continuity.doc) Remaining issues on service continuity for SL relay ZTE, Sanechips discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2312497](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312497-SLR_enh_core%20Remaining%20issues%20for%20i2i%20path%20switching.doc) Remaining issues for i2i path switching Sharp discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2312843](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312843.doc) Service continuity enhancements for UE sidelink relay Sony discussion Rel-18 NR\_SL\_relay\_enh

[R2-2313033](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2313033.docx) Discussion on additional aspects for service continuity Huawei, HiSilicon discussion Rel-18 NR\_SL\_relay\_enh-Core

### 7.9.4 Multi-path relaying

Mechanisms to support multi-path scenarios where a UE is connected to the same gNB using one direct path and one indirect path via 1) Layer-2 UE-to-Network relay, or 2) via another UE (where the UE-UE inter-connection is assumed to be ideal).

[R2-2313309](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2313309%20Discussion%20on%20issues%20for%20Multi-path%20relaying.doc) Discussion on remaining issues for multi-path relaying LG Electronics Inc. discussion Rel-18 NR\_SL\_relay\_enh-Core

Proposal 1a: The indirect path failure is reported via a new IndirectPathFailureInformation message for both scenarios.

Proposal 1b: For scenario 1, the new IndirectPathFailureInformation message can include measurement results of serving L2 U2N Relay UE and/or candidate L2 U2N Relay UEs. For scenario 2, this message can include C-RNTIs of candidate relay UEs without measured results for potential indirect path change following this failure report.

Proposal 1c: The failure type is not included in the new IndirectPathFailureInformation message.

Discussion:

OPPO would prefer to reuse the SUI; they think introducing a new message may require more discussion about how we report PC5-RLF (SUI or the new message).

CATT agree with using a new message, but for P1c, they wonder if the failure type is needed.

Apple wonder if SUI could be used for scenario 2. For this case, OPPO think we could discuss whether to introduce a new message just for scenario 2.

InterDigital are fine with P1a and P1b, but for P1c, they wonder why we would not report the failure type (analogous to the DC case).

LG acknowledge that other solutions have been proposed for the PC5-RLF case, but they think the new message could be used for all cases, potentially allowing a duplicated report (or allowing the UE implementation to avoid the duplicated report). The intention is to use the same message for both scenarios. Regarding the failure type, they think there are diverse proposals and it may be difficult to agree to the details, but we could discuss further.

vivo think if we want two solutions for the two scenarios, we could reuse SUI for scenario 1 and use the new message for scenario 2, but considering that it is the last meeting they think we could go for a single solution.

Qualcomm think if an existing message can be reused, we should not introduce a new message.

Xiaomi think it would be strange to use SUI for scenario 2, and the SUI also does not cover other failure cases besides RLF, so some extension would be needed.

Lenovo think the failure type should be added, aligned with legacy; they think it can be helpful for the network.

Nokia also think the failure type can be included; they think the company proposals on this are not so different.

Proposal 2a: Assuming that ReconfigurationWithSync is used for direct path addition or change, CFRA to the target PCell for direct path addition/change is supported by the existing rach-ConfigDedicated in ReconfigurationWithSync without any additional impact to 38.331.

Proposal 2b: Assuming that ReconfigurationWithSync is used for direct path addition or change, the C-RNTI in ReconfigurationWithSync is used for the remote UE to perform RACH towards new PCell on the direct path.

Discussion:

Huawei understand these proposals are aligned with what is currently in the CR and similar to legacy; they think there is no additional spec impact. LG clarify that the intention is to reuse the existing specification.

Proposal 3: Event Z1 agreed for U2N service continuity is also applicable to MP indirect path change without additional impact.

Proposal 4: The network determines when the indirect path is released at remote UE for relay UE’s HO. It is up to the network whether to release the indirect path before or after relay UE’s HO. Note that without spec change, the relay UE sends the notification message with relayUE-HO to the remote UE as currently specified in Rel-17. But the remote UE does not suspend indirect path.

Discussion:

Xiaomi understand if we follow the Rel-17 procedure, it can trigger re-establishment even if the direct path is still available.

Samsung understand in Rel-17, we do not consider relay UE CHO, and they wonder if we keep the same principle here. They think if there is no CHO, the proposal works.

LG do not intend that reestablishment would be triggered; the intention of the proposal is to avoid spec impact to suspend the indirect path. Regarding CHO, they think CHO still works if the notification message is used, but they wonder if we need to consider CHO with relay operation.

Lenovo also think the reestablishment can be avoided; they understand we agreed that when the remote UE receives the notification message due to Uu RLF, it will report indirect path failure, and they think we can align the behaviour for relay UE handover.

InterDigital have some concern with the proposal: If the network is forced to release before HO, it affects the performance of legacy handover, and if it releases after, there will be reestablishment by the remote UE. So they think Lenovo’s suggestion to trigger a failure message would be a better approach.

Apple think the network will essentially always release the indirect path before the handover; they see Lenovo’s suggestion as specifying special handling for a corner case.

Ericsson have some sympathy for Apple’s comment; for the immediate handover case, they think the time scale is such that the message after HO is a corner case.

Samsung think if the network can ensure that the release happens before the HO, everything is OK, but they think there may be cases where this cannot be guaranteed. Lenovo agree with Samsung and note that we handle a similar case in Rel-17.

Nokia agree with Ericsson and Apple that this is an unlikely scenario. OPPO also agree and think if the relay Uu link is crashing, there is other failure case handling, e.g., Uu RLF.

InterDigital think the notification message handles this case, and in Rel-17 we treat RLF and relay HO in the same way; they think the same thing can be done here, and they wonder if it would create a new case if we specify something else.

Samsung think we should not sacrifice the relay UE’s Uu link to avoid a failure case at the remote; the relay UE’s performance should be assured first. They also see specification impact if we handle this case differently.

Xiaomi think the network implementation solution cannot depend on sending the release and the handover command at the same time, because the release has a confirmation. They think it is a valid case.

LG think the network can send the two reconfigurations together, but there will be cases where the handover triggers first and the path release comes later. However, they think the worst case here is recoverable packet loss or delay.

Huawei somewhat share Apple’s view; they think there are ways for the network implementation to avoid reestablishment, e.g., including the remote UE release in the HO command.

InterDigital wonder what the remote UE does when it receives the notification message: reestablishment? Samsung have the same concern, and they also wonder what will happen with CHO or LTM.

OPPO understand that in the current running CR, the remote UE when it receives the notification message will report indirect path failure. Huawei understand we previously agreed that this does not happen for relay UE HO. InterDigital think the running CR is written with unified handling of the cases.

LG think when the notification message is received, the remote UE will do cell reselection, but they doubt if this will be applied to the MP case.

Ericsson think we are discussing a corner case.

Proposal 5: The remote UE reports C-RNTI(s) of candidate relay UE(s) to gNB via the existing UEAssistanceInformation message for indirect path addition/change.

Proposal 6: when L2 MP Remote UE with multi-path initiates the RRC connection re-establishment procedure, the L2 MP Remote UE does not perform RRC connection re-establishment directly into a multi-path configuration for Scenario 2 as well as Scenario 1.

Discussion:

Huawei note that P5 is in line with the running CR for scenario 2 and companies have not expressed concern. They understand the intention of P5 is only for scenario 2.

Lenovo wonder why P5 does not use SUI; they understand that UAI is mainly for Uu information. vivo think it is because of scenario 2.

Qualcomm wonder if the UE can report candidate relay UEs autonomously or be configured. Huawei indicate that the network configuration is there.

Ericsson wonder if there is a UE capability for candidate relay UE reporting. LG think it can be discussed later.

Proposal 7a: Uu BSR is used to report buffer size only for direct bearers and split bearers, not for indirect bearers.

Proposal 7b: When SL BSR is configured for SL mode 1, only PDCP buffer and UL RLC buffer are considered in data volume calculation of Uu BSR for split bearers as well as direct bearers.

Proposal 7c: Even when SL BSR is not configured i.e. for SL mode 2, only PDCP buffer and UL RLC buffer are considered in data volume calculation of Uu BSR for split bearers as well as direct bearers.

Proposal 7d: When SL BSR is not configured i.e. for SL mode 2, UE reports buffer size only for split bearers and direct bearers, not for indirect bearers.

Proposal 8a: SL BSR is used to report buffer size only for indirect bearers and split bearers, not for direct bearers.

Proposal 8b: When SL BSR is configured for SL mode 1, only PDCP buffer and SL RLC buffer are considered in data volume calculation of SL BSR for split bearers as well as indirect bearers.

Agreements:

The indirect path failure is reported via a new IndirectPathFailureInformation message for both scenarios.

For scenario 1, the new IndirectPathFailureInformation message can include measurement results of serving L2 U2N Relay UE and/or candidate L2 U2N Relay UEs. For scenario 2, this message can include C-RNTIs of candidate relay UEs without measured results for potential indirect path change following this failure report.

Failure type is included in the IndirectPathFailureInformation message; details can be worked out in CR drafting.

Assuming that ReconfigurationWithSync is used for direct path addition or change, CFRA to the target PCell for direct path addition/change is supported by the existing rach-ConfigDedicated in ReconfigurationWithSync without any additional impact to 38.331.

Assuming that ReconfigurationWithSync is used for direct path addition or change, the C-RNTI in ReconfigurationWithSync is used for the remote UE to perform RACH towards new PCell on the direct path.

Event Z1 agreed for U2N service continuity is also applicable to MP indirect path change without additional impact.

The network determines when the indirect path is released at remote UE for relay UE’s HO. No special-case handling at the relay UE for the case that the relay UE hands over before the indirect path is released. The MP remote UE does not trigger reestablishment when it receives the notification message for relay HO.

For scenario 2, the remote UE reports C-RNTI(s) of candidate relay UE(s) to gNB via the existing UEAssistanceInformation message for indirect path addition/change.

When L2 MP Remote UE with multi-path initiates the RRC connection re-establishment procedure, the L2 MP Remote UE does not perform RRC connection re-establishment directly into a multi-path configuration for Scenario 2 as well as Scenario 1.

Discussed jointly (relay UE entering RRC\_CONNECTED)

[R2-2312870](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312870-Discussion%20on%20trigger%20Relay%20UE%20entering%20CONNECTED%20state-r1.docx) Issue#2-4-Discussion on trigger MP Relay UE entering CONNECTED state Qualcomm Incorporated, Huawei, HiSilicon, CATT, CMCC discussion NR\_SL\_relay\_enh-Core

Proposal 1: Rel-18 MP Relay UE indicates its release or whether to support PC5-RRC triggering in discovery message (i.e. AS container), and the Remote UE sends the indication to the gNB.

Proposal 2: If proposal 1 is not agreed, PC5-RRC based trigger should be removed from the running CR. And it is left to gNB to select target Relay UE and configure MP relay based on e.g. whether the gNB and the Remote UE supports split SRB1.

[R2-2313213](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2313213-%20Discussion%20on%20the%20release%20version%20indication%20of%20MP%20Relay%20UE.docx) Discussion on the release version indication of MP Relay UE OPPO, Interdigital, NEC, vivo, ZTE, Ericsson discussion Rel-18 NR\_SL\_relay\_enh-Core

[Proposal 1 For bringing the idle/inactive relay UE to RRC\_CONNECTED, RAN2 not pursue a solution where candidate relay UE indicates its release-version or capability to remote UE before PC5 link establishment.](#_Toc149897166)

Discussion:

Apple think it is not necessary to remote the PC5-RRC trigger from the running CR; if it does not work, it can be reported as a failure.

Xiaomi think even if the release is not introduced, the agreement on PC5-RRC trigger does not need to be reverted. They also think including the version might require SA2 configuration.

vivo do not understand the motivation to remove an already agreed function.

Qualcomm think if we include the version in the AS container in discovery, it does not impact SA2/CT1, and they think the PC5-RRC trigger will never be used if we do not have version indication.

OPPO think SA3 impact cannot be avoided if we put a UE capability in broadcast. If there is no indication, they think the PC5-RRC message can still be used in inactive, and the idle case can be handled as a failure.

Huawei think there is no security concern because the discovery message already has some security protection. They think the failure handling does not work because the remote UE does not know why the procedure failed.

LG have sympathy with P2 from the first document. They wonder if the AS layer capability message instead of discovery can resolve it.

Kyocera are concerned about P2; they understood that the relay UE can be selected irrespective of state.

InterDigital think this is an optimisation discussion; we have the PC5-RRC trigger, and the possibility for the network to configure a split bearer, and what is left is a corner case. OPPO agree with InterDigital and think the security concern is the difficult point; they understand from SA3 side that the security on the discovery messages may not be appropriate for this case.

vivo think it is an optimisation in the last meeting. Qualcomm think it is more important than an optimisation, but they can be OK to have no indication as long as we remove the PC5-RRC trigger.

ZTE think the PC5-RRC trigger itself is an optimisation and configuring the split bearer can solve the problem. They think the trigger could be used for RRC\_INACTIVE UEs and prefer to keep it as it is.

Qualcomm wonder what the use for the PC5-RRC trigger is, noting that retrieving the inactive UE context based on L2ID may be unreliable. Huawei are also not convinced that it can work, and they think all that is needed is an indication in the AS container.

InterDigital think this is only an issue of a Rel-17 relay UE and should not cause us to back out the solution for the normal Rel-18 case. They wonder if support of Rel-17 relays will be an important use case.

Ericsson wonder if we should send an LS to SA2 and let them decide what we send in the discovery message.

[R2-2312175](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312175%20(R18%20SL%20Relay%20WI_AI794%20MultiPath_PDCP_OpenIssues).doc) Open Issues on PDCP for Multipath InterDigital discussion Rel-18 NR\_SL\_relay\_enh-Core

Proposal 1: Single ul-DataSplitThreshold, configured as in legacy DC, is re-used in MP for Rel18. No further impact to current PDCP running CR is assumed for data transfer to a split bearer.

Proposal 2: The remote UE PDCP can indicate SDU discard to the relay UE over the N3C. How the indication is carried to the relay UE is outside 3GPP scope.

Proposal 3: The remote UE PDCP can indicate data volume for MP to the N3C for its use by the relay UE.

Proposal 4: If PDCP duplication is configured and successful delivery of a PDCP data PDU is confirmed by the AM RLC entity on the direct path, the remote UE can indicate discard of the duplicate PDCP PDU to the N3C (for use by the relay UE).

[R2-2312429](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312429%20Remaining%20issues%20on%20the%20support%20of%20multi-path%20relaying.docx) Remaining issues on the support of multi-path relaying ZTE, Sanechips discussion Rel-18 NR\_SL\_relay\_enh-Core

Proposal 1 Regarding security key update during direct path addition/change, it is suggested to discuss following tow options:

Option1: gNB and UE exchange PDCP switch indication to indicate key updates for the subsequent packet transmission.

Option2: gNB re-establish Uu Relay RLC channel in relay UE and remote UE re-transmit UL packets that have not been acknowledged by PDCP status report, irrespective of whether RLC-ACK of the packet is received or not.

Proposal 2 Whether indicate SDU discard to the non-3GPP interface can be up to UE implementation.

Proposal 3 No need to indicate PDCP data volume to the non-3GPP interface.

Proposal 4 It is suggested to set a new data split threshold for multi-path relay.

Proposal 5 For Scenario2, no need to introduce T420-like timer to control indirect path addition/change procedure.

Proposal 6 The T420-like stop condition for indirect path addition/change is upon establishing PC5 RRC connection with relay UE.

Proposal 7 No needs to handle the case that target relay UE reselects a different cell.

Proposal 8 All Uu failure types have been included in MFI, no need to introduce additional IE for direct path failure.

Proposal 9 Add a new indirect path failure in MCF failure type, no need to differentiate detailed PC5 failure type.

Proposal 10 For the case that failure detection on the existing path with additional path addition, UE follow legacy single path procedure(i.e. reestablish RRC via cell/Relay reselection), no enhancement is needed.

P6 and P8 (relay handover and WA on T304)

[R2-2312339](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312339%20Discussion%20on%20remaining%20issues%20on%20Multi-path.doc) Discussion on remaining issues for Multi-path Relay Apple discussion Rel-18 NR\_SL\_relay\_enh-Core

Proposal 6 For relay UE handover case in Scenario 1 (and Scenario 2 if applicable), rely on network to release MP configuration at remote UE before relay UE is handed over.

Proposal 8 RAN2 confirms the WA “Upon T304 expiry for direct path addition/change, RRC reestablishment is always triggered w/o any condition”.

Discussion:

Xiaomi can accept the WA.

Agreement:

Confirm the WA “Upon T304 expiry for direct path addition/change, RRC reestablishment is always triggered w/o any condition”.

[R2-2311873](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2311873.docx) Discussion on multi-path Xiaomi discussion

[R2-2311879](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2311879%20-%20Discussion%20on%20control%20plane%20procedure%20of%20multi-path%20Relay.docx) Discussion on control plane procedure of multi-path relay OPPO discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2311953](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2311953_Discussion%20on%20CP%20Issues%20of%20Multi-path%20Relaying.docx) Discussion on CP Issues of Multi-path relay NEC discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2311954](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2311954_Discussion%20on%20UP%20Issues%20of%20Multi-path%20Relaying.docx) Discussion on UP Issues of Multi-path relay NEC discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2311991](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2311991%20Discussion%20on%20control%20plane%20remaining%20issues%20of%20multi-path%20relaying.docx) Discussion on control plane remaining issues of multi-path relaying China Telecom discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2311992](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2311992%20Discussion%20on%20user%20plane%20remaining%20issues%20of%20multi-path%20relaying.docx) Discussion on user plane remaining issues of multi-path relaying China Telecom discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2312008](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312008%20Discussions%20on%20multi-path.docx) Discussions on multi-path Fujitsu discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2312096](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312096_Remaining%20issues%20on%20Multi-path%20relay.docx) Remaining issues on Multi-path relay vivo discussion

[R2-2312174](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312174%20(R18%20SL%20Relay%20WI_AI794%20MultipathRemainingIssues).doc) Remaining RRC Issues for Multipath InterDigital discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2312176](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312176%20(R18%20SL%20Relay%20WI_AI794%20DirectPathRelease.doc) Specifying the Direct Path Release in Multipath InterDigital, Apple, Ericsson, Xiaomi discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2312418](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312418_Open%20Issues%20Specific%20for%20MP%20Scenario%201%20or%20Scenario%202.docx) Open Issues Specific for MP Scenario 1 or Scenario 2 CATT discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2312419](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312419_Open%20Issues%20Common%20for%20MP%20Scenario%201%20and%20Scenario%202.docx) Open Issues Common for MP Scenario 1 and Scenario 2 CATT discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2312453](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312453%20Failure%20handling%20in%20indirect%20path%20addition%20and%20change%20v1.0.docx) Failure handling in indirect path addition and change Lenovo discussion Rel-18

[R2-2312454](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312454%20Open%20Issue%232-1%20related%20to%20direct%20path%20additionchangerelease%20v1.0.docx) Open Issue#2-1 related to direct path addition/change/release Lenovo discussion Rel-18

[R2-2312498](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312498-MP.docx) Remaining issues for multi-path relay Sharp discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2312540](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312540%20Remaining%20points%20in%20Multipath%20relaying.docx) Remaining points in Multipath relaying Lenovo discussion NR\_SL\_relay\_enh-Core

[R2-2312568](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312568%20Remaining%20issues%20on%20multi-path%20relaying.docx) Remaining issues on multi-path relaying Spreadtrum Communications discussion Rel-18

[R2-2312690](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312690%20CP%20remaining%20issues%20on%20multi-path%20operation.docx) CP remaining issues on multi-path operation Huawei, HiSilicon discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2312691](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312691%20UP%20remaining%20issues%20on%20multi-path%20operation.docx) UP remaining issues on multi-path operation Huawei, HiSilicon discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2312698](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312698%20Remaining%20issues%20on%20multi-path.docx) Remaining issues on multi-path CMCC discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2312699](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312699%20Discussion%20on%20indirect%20path%20addition%20procedure%20for%20MP.docx) Discussion on indirect path addition procedure for MP CMCC discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2312734](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312734_SLRelay_CP_v1.0.docx) Discussion on remaining CP issues on multiple path for sidelink relay Samsung discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2312735](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312735_SLRelay_UP_v1.0.docx) Discussion on remaining UP issues on multiple path for sidelink relay Samsung discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2312844](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312844.doc) Multi-path relaying discussion Sony discussion Rel-18 NR\_SL\_relay\_enh

[R2-2312869](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312869-open%20issues%20for%20MP%20relay.docx) Open issues on multi-path relay Qualcomm Incorporated discussion NR\_SL\_relay\_enh-Core

[R2-2312883](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312883_multipath_relay.docx) Considerations for multipath relay operations for Scenario 1 Kyocera discussion

[R2-2312927](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312927_Discussion_on_multipath%20relays.docx) Discussion on Multipath Relays Ericsson discussion Rel-18

[R2-2313126](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2313126%20Remaining%20isues%20on%20multipath%20relay.docx) Remaining issues for MP relay Nokia, Nokia Shanghai Bell discussion NR\_redcap\_enh-Core

### 7.9.5 DRX

Study the gains and, if needed, specify signalling between gNB and relay UE in sidelink mode 2 to assist the determination of the sidelink DRX configuration used for remote UE. This agenda item will be handled at lower priority.

## 7.24 TEI18

Specific items may be allocated to a breakout session for treatment.

Time budget: 1 TU

### 7.24.0 In Principle Agreed CRs

[R2-2312107](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312107.docx) Positioning restrictions for UE-to-network remote UEs [PosL2RemoteUE] MediaTek Inc., CATT, Huawei, HiSilicon, Qualcomm Incorporated, Xiaomi, Intel Corporation, vivo, Ericsson CR Rel-18 38.305 17.6.0 0134 2 C TEI18 R2-2305852

[R2-2312108](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312108.docx) Capabilities of L2 UE-to-network relay UEs for positioning [PosL2RemoteUE] MediaTek Inc., CATT, Huawei, HiSilicon, Qualcomm Incorporated, Xiaomi, Intel Corporation, vivo, Ericsson CR Rel-18 38.306 17.6.0 0907 3 C TEI18 R2-2306828

[R2-2312109](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312109.docx) Support positioning of L2 UE-to-network remote UEs [PosL2RemoteUE] MediaTek Inc., CATT, Huawei, HiSilicon, Qualcomm Incorporated, Xiaomi, Intel Corporation, vivo, Ericsson, Samsung CR Rel-18 37.355 17.6.0 0444 2 C TEI18 R2-2305854

* Revised in R2-2313814

[R2-2312808](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312808_(LPP%20CR%20on%20local%20coordinates).docx) Support of Local Cartesian Coordinates in LPP [PosLocalCoords] Qualcomm Incorporated CR Rel-18 37.355 17.6.0 0447 1 C TEI18 R2-2305891

* Agreed

[R2-2313046](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2313046_38331.docx) SSR Satellite PCV Residuals [Rel18PCV] Swift Navigation, Ericsson CR Rel-18 38.331 17.6.0 4296 2 C TEI18 R2-2309324

* Agreed

[R2-2313061](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2313061_37355.docx) SSR Satellite PCV Residuals [Rel18PCV] Swift Navigation, Ericsson CR Rel-18 37.355 17.6.0 0465 2 C TEI18 R2-2309322

* Agreed

[R2-2313062](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2313062_36331.docx) SSR Satellite PCV Residuals [Rel18PCV] Swift Navigation, Ericsson CR Rel-18 36.331 17.6.0 4955 2 C TEI18 R2-2309323

* Agreed

[R2-2313063](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2313063_36305.docx) SSR Satellite PCV Residuals [Rel18PCV] Swift Navigation, Ericsson CR Rel-18 36.305 17.3.0 0118 2 C TEI18 R2-2309320

* Agreed

[R2-2313065](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2313065_38.305.docx) SSR Satellite PCV Residuals [Rel18PCV] Swift Navigation, Ericsson CR Rel-18 38.305 17.6.0 0140 2 C TEI18 R2-2309321

* Agreed

[R2-2313583](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2313583.docx) GNSS LOS/NLOS posSIB broadcast assistance information [GNSS LOS/NLOS] Vodafone, Spirent, Ericsson, Telecom Italia, Samsung CR Rel-18 36.331 17.6.0 4931 3 B TEI18 R2-2306786

[R2-2313584](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2313584.docx) GNSS LOS/NLOS posSIB broadcast assistance information [GNSS LOS/NLOS] Vodafone, Spirent, Ericsson, Telecom Italia, Samsung CR Rel-18 38.331 17.6.0 4109 3 B TEI18 R2-2306787

[R2-2313585](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2313585.docx) GNSS LOS/NLOS assistance information [GNSS LOS/NLOS] Vodafone, Spirent, Ericsson, Telecom Italia, Samsung CR Rel-18 37.355 17.6.0 0446 3 B TEI18 R2-2306788

=> Revised in R2-2313591 [AI 7.24.2]

### 7.24.1 TEI proposals by Other Groups

Items initiated by other groups that is/has been communicated by LS, where the other group indicate this is TEI18. (Specific other-group-WIs should use the R18 Other Agenda Item below).

Including outcome of [AT123bis][018][CG-SDT TEI18] LS to RAN1 (Ericsson)

[R2-2312446](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312446%20Introduction%20of%201-symbol%20PRS%20in%2037.355%5b1symbol_PRS%5d.docx) Introduction of 1-symbol PRS in 37.355[1symbol\_PRS] ZTE Corporation CR Rel-18 37.355 17.6.0 0437 4 B TEI18 R2-2308141

* Agreed

[R2-2312447](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312447%20Introduction%20of%201-symbol%20PRS%20in%2038.331%5b1symbol_PRS%5d.docx) Introduction of 1-symbol PRS in 38.331[1symbol\_PRS] ZTE Corporation CR Rel-18 38.331 17.6.0 4014 4 B TEI18 R2-2308140

* Agreed

### 7.24.2 TEI proposals by RAN2

Items initiated in RAN2 for NR and LTE.

Tdoc limitation: 1 tdoc, limitation only applicable for non-previously-agreed-to-be-considered TEI proposals.   
proposals that has been agreed or agreed to be considered are not limited by the tdoc limitation.

Including outcome of [Post123bis][403][POS] BT AoA/AoD (Ericsson)

PosL2RemoteUE (including AIP CR R2-2312110 which has related changes proposed under this AI)

[R2-2312110](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312110.docx) Downlink positioning support and posSIB request for L2 UE-to-network remote UE [PosL2RemoteUE] MediaTek Inc., CATT, Huawei, HiSilicon, Qualcomm Incorporated, Xiaomi, Intel Corporation, vivo, Ericsson, Samsung, ZTE CR Rel-18 38.331 17.6.0 4066 5 C TEI18 R2-2306839

[R2-2312129](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312129%20Further%20corrections%20on%20Positioning%20for%20remote%20UEs.doc) Further corrections to RRC CR on Positioning for remote UEs Lenovo discussion Rel-18 TEI18

Discussion:

Samsung think the change on conditional presence for SBAS-ID is wrong; it should be optional even when GNSS-ID is set to sbas. Lenovo think we have to provide a need code.

[R2-2312444](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312444%20Clarification%20on%20remote%20UE%20behaviour%20when%20receiving%20SFN-DFN%20offset%20for%20positioning.docx) Clarification on remote UE behaviour when receiving SFN-DFN offset for positioning ZTE Corporation CR Rel-18 38.331 17.6.0 4431 - B TEI18

Discussion:

Lenovo think the procedural text does not reflect the SetupRelease. ZTE can revise.

* [AT124][416][POS] CRs on positioning for L2 remote UEs (ZTE)

Scope: Merge the changes from R2-2312129 and R2-2312444 into R2-2312110, and confirm the CRs on [PosL2RemoteUE] (including R2-2312936 to 38.305).

Intended outcome: Agreed CRs (without CB if possible); merged CR in R2-2313813

Deadline: Thursday 2023-11-16 1900 CST

R2-2313813 Downlink positioning support and posSIB request for L2 UE-to-network remote UE [PosL2RemoteUE] MediaTek Inc., CATT, Huawei, HiSilicon, Qualcomm Incorporated, Xiaomi, Intel Corporation, vivo, Ericsson, Samsung, ZTE, Lenovo CR Rel-18 38.331 17.6.0 4066 6 C TEI18 R2-2306839

R2-2313814 Support positioning of L2 UE-to-network remote UEs [PosL2RemoteUE] MediaTek Inc., CATT, Huawei, HiSilicon, Qualcomm Incorporated, Xiaomi, Intel Corporation, vivo, Ericsson, Samsung CR Rel-18 37.355 17.6.0 0444 3 C TEI18 R2-2305854

[R2-2312936](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312936%20posSIB.docx) Forwarding on posSIBs relaying to remote UE [PosL2RemoteUE] Ericsson CR Rel-18 38.305 17.6.0 0151 - B TEI18

Discussion:

ZTE think we agreed to capture this agreement.

MUSIM paging cause forwarding

[R2-2312195](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312195_38306_Rel_18_CR0978_MUSIM%20paging%20cause%20forwarding.docx) MUSIM paging cause forwarding vivo, Samsung CR Rel-18 38.306 17.6.0 0978 - B LTE\_NR\_MUSIM-Core, NR\_SL\_relay-Core

* Revised in R2-2313861 (coversheet)

R2-2313861 MUSIM paging cause forwarding vivo, Samsung CR Rel-18 38.306 17.6.0 0978 1 B LTE\_NR\_MUSIM-Core, NR\_SL\_relay-Core

* Agreed online based on same content as R2-2312195
* Revised in R2-2313811 (same content as agreed online, additional cosigners)

R2-2313811 MUSIM paging cause forwarding vivo, Samsung, Ericsson, Qualcomm Incorporated CR Rel-18 38.306 17.6.0 0978 2 B LTE\_NR\_MUSIM-Core, NR\_SL\_relay-Core

* Agreed

[R2-2312196](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312196_38331_Rel_18_CR4414_MUSIM%20paging%20cause%20forwarding.docx) MUSIM paging cause forwarding vivo, Samsung CR Rel-18 38.331 17.6.0 4414 - B LTE\_NR\_MUSIM-Core, NR\_SL\_relay-Core

* Revised in R2-2313862 (coversheet)

R2-2313862 MUSIM paging cause forwarding vivo, Samsung CR Rel-18 38.331 17.6.0 4414 1 B LTE\_NR\_MUSIM-Core, NR\_SL\_relay-Core

* Add “NOTE: The relay UE can forward the paging cause to the connected remote UE if the relay UE supports MUSIM paging cause.”
* Agreed with this change as R2-2313810

Discussion:

Ericsson are OK with the intention but think a NOTE is needed that the relay UE will forward the cause if it has the capability to.

Qualcomm support the CRs.

BT-AoA-AoD

[R2-2312943](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312943%20BLESummary.docx) [Post123bis][403][POS] BT AoA/AoD (Ericsson) Ericsson report Rel-18

[R2-2312944](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312944%20stage2LTE.docx) Bluetooth AoA/AoD support [BT-AoA-AoD] Ericsson CR Rel-18 36.305 17.3.0 0119 - B TEI18

* Agreed

[R2-2312945](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312945%20stage2NR.docx) Bluetooth AoA/AoD support [BT-AoA-AoD] Ericsson CR Rel-18 38.305 17.6.0 0153 - B TEI18

* Agreed

[R2-2312946](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2312946%20BLELPP.docx) Bluetooth AoA/AoD support [BT-AoA-AoD] Ericsson CR Rel-18 37.355 17.6.0 0480 - B TEI18

* Agreed

Discussion:

Qualcomm think the email discussion did not cover the right scope and the CRs do not match the agreements we made.

Ericsson understand that the CRs follow the agreement with some additional parts that were proposed in the email discussion to address the FFS points.

AT&T think we should start this discussion and have hooks for BT in the standard.

Qualcomm are OK with the BT measurements but do not see the motivation for the additional assistance data.

Xiaomi find that some details of the behaviour are not clear and may be duplicated. Ericsson understand that this is similar to MDT where the gNB can suggest that the UE turn on GNSS.

GNSS LoS/NLoS revision of AIP CR

[R2-2313591](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202311%20-%20RAN2_124,%20Chicago\Extracts\R2-2313591%2037355%20CR%20rev4%20GNSS%20LOS-NLOS%20editorial.docx) GNSS LOS/NLOS assistance information [GNSS LOS/NLOS] Vodafone, Spirent, Ericsson, Telecom Italia, Samsung CR Rel-18 37.355 17.6.0 0446 4 B TEI18 R2-2313585

Discussion:

Qualcomm think some cleanup is needed (changes on changes and ASN.1 structure). They also note that there is no capability.

* [AT124][415][POS] GNSS LOS/NLOS CR finalisation (Vodafone)

Scope: Check the LPP CR in R2-2313591 and confirm agreement on the related AIP CRs.

Intended outcome: Agreed CR package (without CB if possible); LPP CR revision in R2-2313809

Deadline: Thursday 2023-11-16 1900 CST

R2-2313809 GNSS LOS/NLOS assistance information [GNSS LOS/NLOS] Vodafone, Spirent, Ericsson, Telecom Italia, Samsung CR Rel-18 37.355 17.6.0 0446 5 B TEI18 R2-2313585

## 7.25 R18 Other

Specific items may be allocated to a breakout session for treatment.

Impacts from Other RAN WGs and TSGs that has no separate TU budget in RAN2. LS ins for Rel-18 specific WIs/SIs that has no RAN WI.

Time budget: 2 TU

Tdoc Limitation: -

### 7.25.3 Other

RAN3, SA2, SA3, CT1 led items and others, e.g. eNPN, Slicing.

[R2-2312942](C:\\Users\\mtk16923\\Documents\\3GPP Meetings\\202311 - RAN2_124, Chicago\\Extracts\\R2-2312942 LCSUPP.docx" \o "C:\Users\mtk16923\Documents\3GPP Meetings\202311 - RAN2_124, Chicago\Extracts\R2-2312942 LCSUPP.docx) Introduction of LCS User Plane Ericsson CR Rel-18 38.305 17.6.0 0152 - B TEI18

* Postponed (can be taken after the Rel-18 specs have been created)

Discussion:

Qualcomm think the CR is technically correct, but think there is a collision in the modified figure; they think it should be implemented after the Rel-18 specs are created. Huawei think it could be merged with the existing stage 2 CR in our WI. Intel think we could postpone it for the specs to be ready.