3GPP TSG-RAN WG2 Meeting #123 R2-23xxxxx

Toulouse, France, 21-25 August 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: 8 tdocs in total for all sub agenda items.

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

## 5.3 NR Positioning Support

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

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

(NR TEI16 Positioning)

### 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.

Incoming LS

[R2-2308268](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2308268.docx) LS on SSR orbit and clock correction reference for BDS in 3GPP LPP (contact: Ericsson) RTCM SC 104 LS in Rel-16 NR\_pos-Core To:RAN2

* Noted

CRs

[R2-2308476](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2308476%20BDSSSR.docx) GNSS SSR BDS orbit emphemeris reference clarification to align with RTCM Ericsson CR Rel-16 37.355 16.11.0 0460 - F NR\_pos-Core

Discussion:

CATT indicate that B3I is not enabled in Rel-16, so there is a problem with this version of the CR: It should only refer to B1I.

Qualcomm note that there is an editorial issue with the quote marks (should be straight, not “curly”). Can be fixed in update.

* Agreed with these changes as R2-2309102

[R2-2308477](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2308477%20BDSSSR.docx) GNSS SSR BDS orbit emphemeris reference clarification to align with RTCM Ericsson CR Rel-17 37.355 17.5.0 0461 - A NR\_pos-Core

* Agreed as R2-2309103 (changed to cat F)

Withdrawn/Not available

R2-2307357 Correction to 38.305 on E-CID Huawei, HiSilicon CR Rel-16 38.305 16.9.0 0137 - F NR\_pos-Core Withdrawn

R2-2307358 Correction to 38.305 on E-CID Huawei, HiSilicon CR Rel-17 38.305 17.5.0 0138 - A NR\_pos-Core Withdrawn

### 5.3.2 RRC corrections

Including impact to 36.331, 38.331, and 38.306.

### 5.3.3 LPP corrections

[R2-2308474](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2308474%20GNSSTropo.docx) Correcting GNSS Ionospheric and Troposperic Delay Correction quality representation Ericsson CR Rel-16 37.355 16.11.0 0458 - F NR\_pos-Core

* Not pursued

[R2-2308475](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2308475%20GNSSTropo.docx) Correcting GNSS Ionospheric and Troposperic Delay Correction quality representation Ericsson CR Rel-17 37.355 17.5.0 0459 - A NR\_pos-Core

* Not pursued

Discussion:

CATT understand that the definition of the correction was copied from the RTCM message, and this would introduce a conflict. Ericsson indicate it was copied from CLAS; Qualcomm understand that this is the same as the RTCM CSSR.

Qualcomm do not see this as a correction; they agree the grids can be large, but this is also the case in CLAS. Nokia have the same view and think it is an enhancement rather than a correction.

Swift are generally supportive but have a few questions for clarification. They understand the interpretation is that you must receive the precorrection as well as the residual, and they think the model being used for extrapolation also needs to be included.

Ericsson think it is a practical issue from Rel-16.

Qualcomm think nothing is broken in the existing specs.

Apple agree that this is an enhancement, not a correction.

Swift think some clarification is needed to the existing interpretation of the tiles. Qualcomm think this would be a separate issue and a separate CR.

Ericsson indicate that a large grid will create quality differences across the grid if we do not have corrections per grid point. Qualcomm think we do not provide assistance data for grids of a size that would make it critical (e.g. notification area, not the whole of Europe). Ericsson think this depends on implementation, and the specification allows very large grid areas.

Nokia think it is clearly an enhancement and could be considered as a TEI18 proposal.

[R2-2308688](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2308688_Addition%20of%20field%20descriptions%20for%20nr-DL-PRS-ResourceSetID_nr-DL-PRS-ResourceID-R16.docx) Addition of missing field description for nr-DL-PRS-ResourceID/nr-DL-PRS-ResourceSetID Samsung CR Rel-16 37.355 16.11.0 0462 - F NR\_pos-Core

* Not pursued

[R2-2308689](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2308689_Addition%20of%20field%20descriptions%20for%20nr-DL-PRS-ResourceSetID_nr-DL-PRS-ResourceID-R17.docx) Addition of missing field description for nr-DL-PRS-ResourceID/nr-DL-PRS-ResourceSetID Samsung CR Rel-17 37.355 17.5.0 0463 - A NR\_pos-Core

* Not pursued

Discussion:

Nokia do not see it as an essential correction; they think the description of the corresponding IE is sufficient. CATT also do not think it is an essential correction, and for DL-TDOA the wording is not correct.

Ericsson have the same view as Nokia.

vivo agree with Ericsson and Nokia and think the spec is currently clear enough. Samsung are OK to follow the majority view, but they indicate that in the Provide Location Information message, the resource is used for each measurement element, and the intention was to capture this in the field description.

### 5.3.4 MAC corrections

# 6 NR Rel-17

## 6.2 NR Sidelink relay

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

Tdoc Limitation: 2 tdocs

### 6.2.1 Control plane and Stage-2 corrections

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

Rapporteur summary

[R2-2308953](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2308953%20Report%20of%20%5bPre123%5d%5b401%5d%5bRelay%5d%20Summary%20of%20AI%206.2.1.docx) [Pre123][401][Relay] Summary of AI 6.2.1 on Rel-17 relay control plane (Huawei) Huawei, HiSilicon discussion Rel-17

38.300 corrections

Proposal 1: The stage 2 CRs in R2-2308272 and R2-2308553 are not essential, thus not pursued.

* R2-2308272 and R2-2308553 are not pursued

38.331 corrections

Proposal 2: The following RRC changes are agreeable. Can further discuss whether to merge into one Miscellaneous CR or have separate CRs.

1) the change in R2-2307194: Updated the text to clarify that UuMessageTransferSidelink message includes only one PagingRecord.

2) the change in R2-2307239: Adding trigger condition “or if the information carried by the sl-PagingInfo-RemoteUE has changed since the last transmission of the RemoteUEInformationSidelink message”.

3) the changes in R2-2307727: Change #1: In 5.3.3.1a, added the conditions to check SIB12 whether the network supports L2 U2N relay discovery or L3 U2N relay discovery or non-relay discovery. Change #2: In 5.3.13.a1, added the conditions to check SIB12 whether the network supports L2 U2N relay discovery or L3 U2N relay discovery or non-relay discovery.

4) the change in R2-2307755: Correct the “ue-TimersAndConstantsRemoteUE” in the specification text to “sl-TimersAndConstantsRemoteUE”.

5) the changes in or related to R2-2307852: In 5.3.8.3 and 5.3.11, clarify that relay UE can reestablish SL-RLC0/SL-RLC1/SRAP entity after release or not release SL-RLC0/SL-RLC1 /SRAP entity upon going to idle/inactive state. In 9.2.5, added “RRCResumeRequest1” and changed “Identity” to “identity”.

6) the change in R2-2307853: In 5.8.3.3, moved the inclusion of “sl-SourceIdentityRemoteUE“ to one level up (from level-4 to level-3), so that it can be decided independently from the level-3 Rx Discovery conditions.

7) the changes in R2-2308210: Change #1: In clause 5.8.15.2, add “PCell” before “camping cell”, to cover connected state, i.e. when RSRP of Pcell is evaluated, Remote UE should take Relay UE’s serving cell as Pcell. Change #2: In clause 6.3.2, add discovery case into the IE description of ReportConfigNR-SL, and related field description. Change #3: In clause 6.3.5, add discovery case into the IE description of SL-BWP-Config, and SL-ConfigDedicatedNR. Change #4: In 5.3.3.7, 5.3.3.8, 5.3.5.5.2, 5.3.13.5, 5.3.15.2, “Notification message” is replaced with “NotificationMessageSidelink” in the sentence “sends Notification message to the connected L2 U2N Remote UE(s) in accordance with 5.8.9.10.”. Change #5: In 5.3.7.7, fix typo “receiption”.

8) the change related to R2-2308271: For a UE capable of L2 U2N Remote UE, it can perform relay selection when cell selection is triggered, which can be added as a unified condition of relay selection in 5.8.15.3.

9) the changes in R2-2308275: In subclause 5.5.3.2, add the “for U2N Relay (re)selection evaluation” entry to apply Layer 3 filtering, and remove “L2” to cover both L2 and L3 U2N Relay UEs (if applicable).

10) the change in R2-2308550: in Section 6.3.5, remove “, e.g. SRAP-Config” from the IE description of SL-L2RelayUE-Config.

11) the change in R2-2308714: In clause 5.2.2.2.1, “clause 5.8.9.8.3” in the corresponding statement is modified as “clause 5.8.9.9.3”.

Discussion:

Xiaomi understand that point 2 is not in line with past decisions. OPPO indicate that the current text does not explain the conditions clearly. Apple agree with Xiaomi that the current sentence indicates that any information change in RemoteUEInformationSidelink will trigger this message.

Xiaomi think if we take this change we should reconsider R2-2207179.

Apple wonder why we need the initial “upon change of any information” in this section if we do not retransmit upon any change.

Huawei recall that when the spec was drafted, we had a general principle that if any information was changed the UE could send this message, and the additional conditions were added later, creating some apparent overlap. The contribution referred to by Xiaomi is about change of interest in the SIB, and they understand that companies felt this was already clear. They also agree with Apple that we could generalise the text and avoid including more details in the conditions.

Xiaomi think the earlier proposal and this change are quite similar in their effects.,

Ericsson want to make sure that a generic solution would not include any specific scenarios.

To be included in offline.

Apple understand the intention of point 3, but they think it is only for the discovery process and may not apply to the L2 relay case; they understand that the condition will never be evaluated in this case. They also are not sure why the UE wants to go to connected state in this scenario. Ericsson have a similar understanding; upon reception of SIB12, the UE knows whether it can use discovery. They think this was discussed in the last meeting.

Samsung think this change is needed to align with previous meetings’ discussion of how to handle SIB12. For Apple’s concern, they understand that we had some general discussion on the upper layer interpretation, but relay selection will be triggered from upper layers and the AS layer will deliver the AS container to the upper layer; they see that it applies for L2/L3 relay.

Huawei indicate that last meeting, we said the UE checks SIB12 and calls the discovery procedure if discovery is supported, and there is currently no mention of how the UE obtains the resource pool configuration; there is a procedure that triggers the UE to move into RRC\_CONNECTED if there is no resource pool in SIB12. So they understand that the change is needed. To Apple’s comment, they agree that a UE implementation may have this kind of inter-layer interaction, but it has not been specified.

Ericsson think this is just about whether the network supports relay discovery, and they understand that we captured in a NOTE that it is up to network implementation to guarantee that the UE has the needed resource pools.

NEC agree with the intention of the CR, but when they checked the IE structure of SIB12, they found that the wording is not quite accurate and it should be about whether the gNB can support the corresponding operation.

Samsung agree that NEC’s comment is correct, but the CR tries to follow the existing wording in SIB12. NEC think it is not accurate as written.

Ericsson understand that the concern is that the UE gets into connected state and the network does not support discovery, and this allows the UE to request a dedicated configuration. They do not see the point of such a scenario, so they think the first case is not valid. Huawei understand the intention is to avoid the UE moving to RRC\_CONNECTED when it cannot get a configuration because the network does not support the feature. Ericsson think the UE will not request a relay configuration without knowing if the network supports it. Samsung indicate that this is directed to the case where SIB12 indicates support but there is no Tx discovery pool.

Apple think the change may not be necessary because the condition will never trigger, and maybe a different change could be considered to capture an indication to upper layers to prevent them from trying to transmit inappropriately.

* Intention is to avoid the UE going to connected mode to request a relay configuration that the network cannot provide.
* Offline to conclude on how best to realise this.

Nokia think on point 5, the intention is to add some clarification on whether the UE releases or re-establishes the RLC channels; they are not sure if something is wrong with the current spec.

Apple think the current spec has a problem because it forces the RLC channels to be released, and the relay UE will not be able to receive on them.

Huawei indicate that upon going to idle/inactive, the relay UE will release all resources including RLC channels, but the remote UE will re-establish SL-RLC0/1, which should only be needed at unicast link establishment. So they understand that the current spec forces the remote UE to perform unicast link release and establishment, which is not absolutely broken but not ideal, and they think it makes sense to allow re-establishment of the entities instead of release.,

Nokia agree that nothing is broken. Apple think the current normative text has the remote and relay keep the PC5 unicast link, which gives the impression that the link will be reused, but the reuse can never be successful because the RLC channels have been released.

OPPO wonder if this is NBC. Huawei understand that if we required that the relay shall not release the channels, this would impact existing implementations, but if we add a NOTE that the relay is allowed to maintain them, this would be BC. Nokia agree it does not break existing implementations.

Apple indicate the intention is to allow the relay to keep receiving messages from the remote UE. They think the NOTE suggested by Huawei would be acceptable.

* Capture a NOTE that the relay may re-establish the RLC channels.

Ericsson wonder if point 8 is already covered in 38.304. Huawei indicate that in the relay reselection subclause there is no condition for triggering based on cell selection.

Xiaomi think it is already specified that the UE can perform relay selection or cell selection.

OPPO understand that there are conditions for the UE handling in different states for this case, and they think all cases are clearly captured.

Huawei agree that relay reselection triggered by cell selection during RRC re-establishment/release has already been captured, but for this clause there are a lot of detailed triggers listed, and the cell reselection case has not been included.

Nokia think the current text covers the case under “if the UE has no serving cell”.

NEC think the intention is that it is up to UE implementation to perform relay selection or cell selection, and they think the NOTE we have is safer than changing the normative text.

ZTE can accept having the existing NOTE.

* Point 8 is not included.

Apple note that L2 has been removed in the first change of point 9, and they think it is a little strange that we would take the first change without the second. Huawei think the changes to the second clause are not needed because relay reselection does not need to invoke the second clause, but they can accept keeping “L2” in the first clause (i.e., keep the last two changes in the first clause).

vivo think the procedure is intended to cover both L2 and L3, so we should delete “L2” in both.

Huawei indicate the relay reselection clause reuses the filtering procedure, so the filtering procedure is applicable to both L2 and L3, but the measurement derivation is only for L2.

Apple can accept taking the last two changes in the first section.

* Do not delete “L2” in the first requirement of section 5.5.3.2

Apple think one big CR would be OK.

* [AT123][427][Relay] Rel-17 relay RRC CR (Huawei)

Scope: Merge agreed changes for 38.331 to a single general CR.

Intended outcome: Agreeable CR in R2-2309109

Deadline: Thursday 2023-08-24 2000 UTC

R2-2309109 RRC corrections for SL relay Huawei, HiSilicon CR Rel-17 38.331 17.5.0 4300 - F NR\_SL\_relay-Core

Other contributions

[R2-2307194](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2307194_38.331_CR_Corrections%20to%20processing%20of%20paging%20information%20received%20via%20Relay%20UE.docx) 38.331\_CR\_Corrections to processing of paging information received via Relay UE Samsung Electronics Co., Ltd CR Rel-17 38.331 17.5.0 4177 - F NR\_SL\_relay-Core

[R2-2307239](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\38331_CR4180_(REL-17)_R2-2307239%20-%20Correction%20of%20RemoteUEInformationSidelink%20transmission%20condition.docx) Correction of RemoteUEInformationSidelink transmission condition OPPO CR Rel-17 38.331 17.5.0 4180 - F NR\_SL\_relay-Core

[R2-2307727](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\38331_CR4209_R2-2307727_Correction%20on%20NR%20SL%20discovery%20transmission.docx) Conditions for RRC connection establishment and resume for NR sidelink discovery Samsung, Huawei, HiSilicon CR Rel-17 38.331 17.5.0 4209 - F NR\_SL\_relay-Core, NR\_SL\_enh-Core

[R2-2307755](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Docs\R2-2307755.zip) Correction on NR Sidelink Relay RRC Philips International B.V. CR Rel-17 38.331 17.5.0 4212 - F NR\_SL\_relay-Core

[R2-2307852](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2307852%2038331_Correction_SRAP_configuration.docx) Corrections on SRAP related configurations for SL relay Apple CR Rel-17 38.331 17.5.0 4215 - F NR\_SL\_relay-Core

[R2-2307853](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2307853%2038331_Correction_L2_Src_ID.docx) Corrections on the reporting of L2 ID for L2 U2N relay operation Apple CR Rel-17 38.331 17.5.0 4216 - F NR\_SL\_relay-Core

[R2-2307955](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2307955_Correction%20on%20CHO%20and%20Path%20Switching%20of%20Remote%20UE.docx) Correction on CHO and Path Switching of Remote UE NEC Corporation CR Rel-17 38.300 17.5.0 0695 - F NR\_SL\_relay-Core

[R2-2308210](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\38331_CR4235_(Rel-17)_R2-2308210%20Miscellaneous%20corrections%20for%20SL%20relay.docx) Miscellaneous corrections for SL relay Huawei, HiSilicon CR Rel-17 38.331 17.5.0 4235 - F NR\_SL\_relay-Core

[R2-2308271](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2308271_Corrections%20to%20TS%2038.331%20on%20SL%20relay%20(re)selection.docx) Corrections to TS 38.331 on SL relay (re)selection ZTE, CAICT, Sanechips CR Rel-17 38.331 17.5.0 4241 - F NR\_SL\_relay-Core

[R2-2308272](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2308272_Corrections%20to%20TS%2038.300%20on%20SL%20relay%20(re)selection.docx) Corrections to TS38.300 on SL relay (re)selection ZTE, CAICT, Sanechips CR Rel-17 38.300 17.5.0 0698 - F NR\_SL\_relay-Core

[R2-2308275](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2308275_Correction%20to%2038.331%20on%20U2N%20relay%20(re)selection.docx) Correction to 38.331 on U2N relay (re)selection vivo CR Rel-17 38.331 17.5.0 4240 - F NR\_SL\_relay-Core

[R2-2308550](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2308550%20-%2038.331_CR4261_Rel17_Miscellaneous%20Corrections%20SL%20Relays.docx) Miscellaneous Corrections for SL Relays Ericsson España S.A. CR Rel-17 38.331 17.5.0 4261 - D NR\_SL\_relay-Core

[R2-2308553](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2308553%20-%2038.300_CR0703_Rel17_Miscellaneous%20Corrections%20SL%20Relays.docx) Miscellaneous Correction for SL Relays Ericsson CR Rel-17 38.300 17.5.0 0703 - D NR\_SL\_relay-Core

[R2-2308714](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2308714%20Corrections%20on%20U2N%20Relay.docx) Corrections on U2N Relay ASUSTeK CR Rel-17 38.331 17.5.0 4281 - F NR\_SL\_relay-Core

### 6.2.2 User plane corrections

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

[R2-2307238](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\38351_CR0023_(REL-17)_R2-2307238%20-%20Correction%20of%20IE%20name%20sl-SRAP-ConfigRemote.docx) Correction of IE name sl-SRAP-ConfigRemote OPPO CR Rel-17 38.351 17.5.0 0023 - F NR\_SL\_relay-Core

* Agreed

Discussion:

Huawei agree with the intention, but they think the current description is a bit unclear.

Samsung think Huawei’s concern is not related to the change in the name.

[R2-2307756](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Docs\R2-2307756.zip) Correction on SRAP for sidelink relay Philips International B.V. CR Rel-17 38.351 17.5.0 0024 - F NR\_SL\_relay-Core

Discussion:

Samsung wonder if the clarification is needed. Philips understand we have the parallel clarification in the uplink direction.

Huawei agree that we should align uplink and downlink.

Apple think the current description of BEARER ID is OK, and if the procedure text covers all cases, we do not need to update the field description.

OPPO would prefer to agree to the Philips CR, and then the Huawei CR in R2-2308211 is not needed.

Huawei are OK to take the Philips CR, but they think a general description of the field is also useful.

Samsung agree that the change from Philips is needed, and they are concerned that we will have redundant text if we also take the change from Huawei. Huawei indicate that there is a bracket in the procedural text explaining the interpretation, but they do not think it is redundant wrt the text in the field definition.

Nokia suggest aligning the text in 5.2.3. Samsung think this could be looked at offline.

Apple think the RAN box should not be checked.

* [AT123][428][Relay] BEARER ID correction in SRAP (Philips)

Scope: Check the CR in R2-2307756 and determine if a parallel change is needed in section 5.2.3.

Intended outcome: Agreeable CR in R2-2309111

Deadline: Thursday 2023-08-24 2000 UTC

R2-2309111 Correction on SRAP for sidelink relay Philips International B.V. CR Rel-17 38.351 17.5.0 0024 1 F NR\_SL\_relay-Core

[R2-2308211](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\38351_CR0025_(Rel-17)_R2-2308211%20Clarification%20on%20the%20BEARER%20ID%20in%20SRAP%20data%20PDU.docx) Clarification on the BEARER ID in SRAP data PDU Huawei, HiSilicon CR Rel-17 38.351 17.5.0 0025 - F NR\_SL\_relay-Core

Discussion:

Samsung note a typo (srb-Identity should be drb-Identity the second time).

OPPO indicate that “info” should be “information”.

Chair notes additional typos: “se” for “set” and “idenfity” for “identify”.

* Agreed with typos fixed as R2-2309110

## 6.4 NR positioning enhancements

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

Tdoc Limitation: 2 tdocs

### 6.4.1 Stage 3 corrections

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).

[R2-2307359](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2307359%20Correction%20to%20Multi-RTT.docx) Correction to Multi-RTT Huawei, HiSilicon CR Rel-17 37.355 17.5.0 0455 - F NR\_pos\_enh-Core

* Agreed as R2-2309104, with ASN.1 alignment fixed

Discussion:

Ericsson think we wanted to avoid having conditions in the uplink. They think we could add something in the field description, but not a condition indicator.

Qualcomm think the CR is fine because we already use the same description for DL-TDOA and DL-AoD, and they disagree with Ericsson’s comment because this is different from a need code as such; they see it as an oversight.

CATT do not think it is essential, because the request already indicates whether this field should be reported.

vivo agree with Qualcomm and think we have the condition for DL-TDOA and DL-AoD.

Intel agree with Qualcomm.

Nokia wonder why the CR does not apply to other methods, and they ask if we cannot report one instance with the existing field.

Samsung share the view of Qualcomm and vivo.

Huawei clarify that the intention is not to have both fields present at the same time, and if the request uses the legacy format, the response will use the legacy field.

Intel agree that this is alignment with the downlink methods.

OPPO agree with the CR.

Qualcomm think there are editorial details with the ASN.1 alignment that should be fixed to save effort in CR implementation.

CATT indicate that the reason for the difference from the DL methods is that there is no UE-based multi-RTT. Qualcomm think it is still valid for UE-assisted and this was just a copying oversight.

[R2-2307360](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2307360%20Correcton%20to%20UE%20capability%20for%20batch%20reporting.docx) Correction to UE capability for batch reporitng Huawei, HiSilicon CR Rel-17 37.355 17.5.0 0456 - F NR\_pos\_enh-Core

* Postponed

Discussion:

Lenovo wonder what the reason was for the addition in the Provide Location Information. Huawei indicate that this is the question they want to address: The LMF can request differently for different methods, but the UE only has a single capability.

vivo think the issue is valid but would prefer to fix the field description (Huawei’s approach 1), because RAN1 indicated only a single capability for this feature.

Intel agree that the capability came from RAN1, and they understand the guidance was that the UE supports it as one capability. They do not think it should be changed in RAN2.

Nokia wonder whether UE-based was also intended by RAN1.

Ericsson agree with Intel and think that RAN1 intended to capture a single functionality for multiple measurements or multiple locations.

Apple think it would be good to have separate capabilities. Qualcomm also think it makes sense, and they suggest that we could ask RAN1. Intel agree.

ZTE agree with sending an LS, and they wonder if we should include the additional option of changing the field description. Intel think how we implement it would be a RAN2 decision, but we can ask RAN1 if it is needed to have a separate capability.

* [AT123][420][POS] LS to RAN1 on batch reporting capability (ZTE)

Scope: Draft an LS to RAN1 inquiring about the need for multiple capabilities for batch reporting, as proposed in R2-2307360.

Intended outcome: Approved LS (without CB if possible) in R2-2309105

Deadline: Wednesday 2023-08-23 2000 UTC

[R2-2309105](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2309105%20LS%20on%20the%20support%20of%20multiple%20location%20estimate%20instances%20in%20a%20single%20measurement%20report.docx) LS on the support of multiple location estimate instances in a single measurement report ZTE Corporation LS out Rel-18 NR\_pos\_enh2 To:RAN1

* Approved (email discussion [AT123][420])

[R2-2307504](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2307504_LPP%20CR%20Missing%20error%20cause%20code%20for%20DL%20PRS%20Measurements.docx) Missing error cause code for DL PRS Measurements Fraunhofer IIS, Ericsson CR Rel-17 37.355 17.5.0 0457 - F NR\_pos\_enh-Core

* Not pursued

Discussion:

Qualcomm wonder what the new cause code really means, and if we need to start having cause codes at such fine granularity. There could be many reasons for an “unable to measure” condition.

Lenovo agree with Qualcomm and think the priority setting is quite dynamic, so they are not sure if the new code helps the LMF.

vivo agree with Qualcomm and think it is too detailed; the network is already aware of the PPW configuration, and if this situation occurs, they think the UE should request a measurement gap.

Ericsson agree that it is granular, but they think the inability to measure in certain PPWs is an error case that should be reflected in the error report. They see that the LMF would benefit from gathering statistics on this sort of event.

[R2-2308478](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2308478%20PeriodicCR.docx) Missing finer periodicities than 1s Ericsson CR Rel-17 37.355 17.5.0 0450 1 F NR\_pos\_enh-Core R2-2306026

* Not pursued

[R2-2308479](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2308479%20PeriodicD.docx) Missing LPP support for sub 1s location information reporting periodicity Ericsson discussion Rel-17

* Noted

Discussion:

Huawei are generally fine with the proposal, and consider that the AS layer granularity should generally be finer than the service layer granularity. They do wonder in which release we should introduce it.

Qualcomm think this is not a correction; they understand that we implemented the RAN1 feature list correctly, and this should be considered as an enhancement.

CATT also think it is not a correction, and they think we need to determine which use case needs it to infer which release it should be introduced in.

vivo note that the minimum value in NRPPa is 640 ms, which is not drastically off from 1 s, so they do not see a big gain from alignment.

Apple think it is an enhancement, not a correction. They think such an enhancement should normally come from lower layers.

Ericsson indicate that the proposal did come from lower layers, and we considered finer periodicities during Rel-17 discussions. They see that the network specs have sub-second periodicities in Rel-17 and LPP is the missing piece, so they consider this an alignment correction rather than an enhancement. They think that the Rel-17 latency requirements force us to have the ability to schedule the reporting with short intervals, so the device can report measurements/position estimates close in time.

Qualcomm think periodic reporting is not really a low-latency feature. They think if we change periodic reporting it should apply to all positioning methods, which again suggests that this is more of an enhancement.

Huawei understand that the LPP periodic reporting is intended to align with the periodicity requests from the service layer, and this just brings LPP into line with CT4 specs.

Ericsson indicate that the CT4 agreements apply to all positioning methods.

vivo think if CT4 want a change, there should be an LS to guide us.

Qualcomm see no connection between LPP periodic reporting and the CT4 specs, which are for deferred MT-LR, whereas periodic reporting in LPP is between UE and LMF, They do not see that the specs are broken.

CATT wonder what the CT4 spec defines for periodic reporting between LMF and AMF. Ericsson indicate that the CT4 specs for reporting between LMF/AMF/GMLC/MAP have all been updated with sub-second periodicities.

CATT think CT4 should send an LS.

OPPO agree there should be an LS.

Qualcomm would like to see how it works end-to-end.

[R2-2308690](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2308690_Addition%20of%20missing%20values%20for%20dl-prs-ResourceSetPeriodicityReq-r17.docx) Addition of missing values for dl-prs-ResourceSetPeriodicityReq-r17 Samsung CR Rel-17 37.355 17.5.0 0464 - F NR\_pos\_enh-Core

* Revised in R2-2309194

Discussion:

Lenovo support the CR.

vivo think it is not needed, because the periodicities are indicated in the SCS of the PCell.

Qualcomm think these are periodicities supported for the PRS, but not supported in the on-demand request. They think this is a real correction.

CATT ask if the proponent checked the RAN1 parameter list; if RAN1 did not provide these periodicities, they think maybe we should check with RAN1. Samsung indicate that they did not find the periodicities in the RAN1 list, but we have a misalignment between the ASN.1 and the field description; they would be OK to send an LS to check.

Lenovo agree that there is a mismatch.

Nokia think it is an essential correction, but they are OK to confirm with RAN1.

CATT would like time to check the RRC parameters.

* [AT123][421][POS] dl-prs-ResourceSetPeriodicityReq-r17 range check (Samsung)

Scope: Evaluate the change proposed in R2-2308690 in light of the RAN1 parameter list.

Intended outcome: Agreeable CR if necessary and report in R2-2309106

Deadline: Wednesday 2023-08-23 2000 UTC

[R2-2309106](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2309106%20Report%20of%20%5bAT123%5d%5b421%5d%5bPOS%5d%20dl-prs-ResourceSetPeriodicityReq-r17%20range%20check%20(Samsung).docx) [AT123][421][POS] dl-prs-ResourceSetPeriodicityReq-r17 range check (Samsung) Samsung discussion Rel-17 NR\_pos\_enh

* Noted

Proposal 1: R2-2308690 is agreed with editorial correction (adding years) on the cover page.

[R2-2309194](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2309194%20Addition%20of%20missing%20values%20for%20dl-prs-ResourceSetPeriodicityReq-r17.docx) Addition of missing values for dl-prs-ResourceSetPeriodicityReq-r17 Samsung CR Rel-17 37.355 17.5.0 0464 1 F NR\_pos\_enh-Core

* Agreed

### 6.4.2 Stage 2 corrections

A single CR with miscellaneous corrections is encouraged. Small editorial corrections should be sent directly to the CR rapporteur. This agenda item will be handled at lower priority.

[R2-2308759](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2308759%20CR_38305_PRU.docx) Correction of PRU overview description Nokia, Nokia Shanghai Bell CR Rel-17 38.305 17.5.0 0139 - F NR\_pos\_enh-Core

* Not pursued

Discussion:

Qualcomm think the existing text is correct and the change would be wrong. Their understanding is that you know the PRU location and what it is supposed to measure, and the point is to compare the measurements taken by the PRU at a known location to the reported measurements from a UE.

vivo agree with Qualcomm and think the comparison is about the measurements.

CATT have the same view, and they checked the LS from RAN1 and found that it did not mention how to use the measurements. They think an alternative change to replace “compared” with “used” could be valid.

Intel wonder if we need to do anything for PRUs in Rel-17.

Nokia can accept majority view and keep the existing text.

# 7 Rel-18

## 7.2 Expanded and improved NR positioning

(NR\_pos\_enh2; leading WG: RAN1; REL-18; WID: RP-231460)

Time budget: 2 TU

Tdoc Limitation: 4 tdocs

### 7.2.1 Organizational

Including incoming LSs and rapporteur inputs.

Incoming LSs with RAN2 in Cc:

[R2-2307007](C:\\Users\\mtk16923\\Documents\\3GPP Meetings\\202308 - RAN2_123, Toulouse\\Extracts\\R2-2307007_R1-2306208.docx" \o "C:\Users\mtk16923\Documents\3GPP Meetings\202308 - RAN2_123, Toulouse\Extracts\R2-2307007_R1-2306208.docx) Reply LS on Sidelink positioning procedure (R1-2306208; contact: Xiaomi) RAN1 LS in Rel-18 Ranging\_SL To:SA2 Cc:RAN2

* Noted

[R2-2307031](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2307031_R3-233424.docx) Reply LS on Authorization and Provisioning for Ranging/SL positioning service (R3-233424; contact: Xiaomi) RAN3 LS in Rel-18 Ranging\_SL, NR\_pos\_enh2 To:SA2 Cc:RAN1, RAN2

* Noted

[R2-2307052](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2307052_S1-231370.docx) Reply LS on the requirement on low power or high accuracy positioning (S1-231370; contact: Huawei) SA1 LS in Rel-18 5G\_eLCS\_Ph3 To:SA2 Cc:RAN1, RAN2

* Noted

Incoming LS with “take into account” action

[R2-2307004](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2307004_R1-2306157.docx) LS reply on the RAT-dependent positioning integrity (R1-2306157; contact: InterDigital) RAN1 LS in Rel-18 NR\_pos\_enh2 To:RAN2 Cc:RAN3

* Noted

Other incoming LSs and draft replies

[R2-2307010](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2307010_R1-2306214.docx) LS to RAN2 on SRS bandwidth aggregation for positioning (R1-2306214; contact: ZTE) RAN1 LS in Rel-18 NR\_pos\_enh2 To:RAN2

[R2-2308139](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2308139%20%5bdraft%5dReply%20LS%20to%20RAN1%20on%20SRS%20bandwidth%20aggregation%20for%20positioning.docx) [draft]Reply LS to RAN1 on SRS bandwidth aggregation for positioning ZTE Corporation LS out Rel-18 NR\_pos\_enh2 To:RAN1

* [AT123][402][POS] LS to RAN1 on SRS bandwidth aggregation (ZTE)

Scope: Draft a reply to R2-2307010, taking online discussion into account.

Intended outcome: Approved LS (without CB if possible) in R2-2309117

Deadline: Wednesday 2023-08-23 2000 UTC

[R2-2309117](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2309117%20Reply%20LS%20on%20SRS%20bandwidth%20aggregation%20for%20positioning.docx) Reply LS on SRS bandwidth aggregation for positioning ZTE Corporation LS out Rel-18 NR\_pos\_enh2 To:RAN1

* Approved (email discussion [AT123][402])

[R2-2307032](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2307032_R3-233474.docx) Reply LS on SRS Configuration Request (R2-2302278; contact: Huawei) RAN3 LS in Rel-18 NR\_pos\_enh2 To:RAN2 Cc:RAN1

* To be concluded after LPHAP discussion

[R2-2307042](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2307042_R4-2310166.docx) LS on reporting granularity for timing related positioning measurements (R4-2310166; contact: Huawei) RAN4 LS in Rel-18 NR\_pos\_enh2 To:RAN2, RAN3 Cc:RAN1

[R2-2307126](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2307126%20Draft%20reply%20LS%20on%20timing%20measurement%20reporting%20granularity_v01.doc) Draft reply LS on timing measurement reporting granularity Huawei, HiSilicon LS out Rel-18 NR\_pos\_enh2 To:RAN4 Cc:RAN1, RAN3

[R2-2307127](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2307127%20Discussion%20on%20measurement%20reporting%20granularity_v01.docx) Discussion on measurement reporting granularity Huawei, HiSilicon discussion Rel-18 NR\_pos\_enh2

* [AT123][403][POS] LS to RAN4 on timing measurement reporting granularity (Huawei)

Scope: Draft a reply to R2-2307042, taking online discussion into account.

Intended outcome: Approved LS (without CB if possible) in R2-2309118 and report in R2-2309176

Deadline: Wednesday 2023-08-23 2000 UTC

[R2-2309176](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2309176%20Summary%20of%20%5bAT123%5d%5b403%5d%5bPOS%5d%20LS%20to%20RAN4%20on%20timing%20measurement%20reporting%20granularity%20(Huawei).docx) Summary of [AT123][403][POS] LS to RAN4 on timing measurement reporting granularity (Huawei) Huawei, HiSilicon discussion Rel-18 NR\_pos\_enh2

Proposal1: The new reporting granularities are needed for the measurement report for DL-TDOA and multi-RTT for absolute, differential and additional path timing measurement reporting. (8/8)

Proposal2: Changes need to be applied for RequestLocationInformation, ProvideLocationInformation, ProvideUECapabilities. (8/8)

Proposal3: Reporting granularity corresponding to k-1 and k-2, corresponding to 0.5 Tc and 0.25 Tc, are needed for absolute reporting, differential reporting and additional path timing measurement reporting. (8/8)

Discussion:

ZTE think it is not necessary to inform RAN4 of our detailed signalling design. They are OK with P1/P2/P3.

Ericsson are generally fine but do not see a need to inform RAN4 of the agreements. They would prefer to handle the proposals in CR development.

Huawei think RAN4 requested certain actions, and we are attempting to meet the actions and send a reply LS.

Agreement:

RAN2 intend to introduce the reporting granularities requested by RAN4. RAN2 will align with the RAN4 parameters as usual; details to be discussed in CR drafting.

Proposal4: Regarding the reply LS to RAN4:

 Inform RAN4 of the RAN2 agreements on LPP signalling

 Ask RAN4 whether the newly introduced reporting granularity can be applicable for the cases without carrier aggregation positioning

 Indicate to RAN4 that RAN2 expects the ranges of the values for newly introduced reporting granularity will be introduced by RAN4 and provided to RAN2 in the RAN4 parameter list

Discussion:

Ericsson note the LS did not actually request a reply. ZTE also think we do not need to reply.

[R2-2309118](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2309118%20Draft%20reply%20LS%20on%20timing%20measurement%20reporting%20granularity_v00_Rapp.doc) Draft reply LS on timing measurement reporting granularity Huawei, HiSilicon LS out Rel-18 NR\_pos\_enh2 To:RAN4 Cc:RAN1, RAN3

[R2-2307054](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Docs\R2-2307054.zip) Reply LS to LS to SA2 on Sidelink positioning procedure (S2-2305735; contact: Xiaomi) SA2 LS in Rel-18 Ranging\_SL To:RAN2, RAN1 Cc:SA3

[R2-2307056](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2307056_S2-2307553.docx) LS on assistance information provided to UE (S2-2307553; contact: Xiaomi) SA2 LS in Rel-18 Ranging\_SL To:RAN2

* [AT123][404][POS] LS(s) to SA2 on sidelink positioning (Xiaomi)

Scope: Draft a reply (or separate replies) to R2-2307054 and R2-2307056, taking online discussion into account.

Intended outcome: Approvable LS(s) in R2-2309119 and summary in R2-2309177

Deadline: Wednesday 2023-08-23 2000 UTC

[R2-2309177](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2309177%20Summary%20of%20%5bAT123%5d%5b404%5d%5bPOS%5d%20LS(s)%20to%20SA2%20on%20sidelink%20positioning%20(Xiaomi)_V1_Rapp.doc) Summary of [AT123][404][POS] LS(s) to SA2 on sidelink positioning (Xiaomi) Xiaomi discussion Rel-18 NR\_pos\_enh2

Proposal 1: (17/17) Tell SA2 that the criterion for located and server UE selection will not be specified. And provide with SA2 the list of parameters that may be used for anchor/server UE selection, including the parameters agreed in this meeting.

Discussion:

Lenovo point out that we already sent an LS to SA2 on the information that can be used for selection, and they are hesitant to send them a broader LS with all potential candidate information. They think we should progress the list of information first.

Xiaomi think we can indicate what we have agreed this meeting, and leave out the detailed parameters that we have not agreed.

CATT prefer to just focus on the questions that SA2 asked, so they agree with the first sentence; they also agree with Xiaomi that the discovery/selection issue can be updated when we have an agreement, but for now they prefer not to increase the scope.

Huawei think the parameters are criteria, and the point is that the exact algorithm for selection will not be specified.

Apple think we should indicate “will not be specified in RAN2”, and they are not sure we need to say anything about the parameters; SA2 will ask if they need to.

Huawei think the specification impact will be similar to what SA2 have; they do not specify the detailed procedure for LMF selection but indicate what parameters may affect it.

Qualcomm think we should focus on things that affect the stage 3, and we already indicated that this will not be specified. They also think we would not normally specify the steps of the overall procedures, and this discussion does not progress our work.

Xiaomi agree with Qualcomm that we already have indicated this to SA2, and we can focus on the second part of question 1: when the selection takes place.

Huawei are not sure why SA2 are asking RAN2 this. Lenovo understand that SA2 have had to take some assumptions about order of procedures, and they need some baseline information.

Apple think SLPP starts after the server has been selected, and what happens before that is not really in RAN2 scope.

Intel tend to agree that this will not impact SLPP, and they understand that SA2 have already captured some order of the steps.

Xiaomi think RAN2 should not focus on why they asked us; they did ask and we should answer. They see diverse views. They think we might be able to agree on option 4 of proposal 2.

CATT agree with Xiaomi and think we should let SA2 fix the issue.

Intel agree with Xiaomi and think option 4 is a good answer.

OPPO also agree and think the selection procedure could be complicated. They think it should be flexible.

Apple think if we go with option 4, we should think carefully about whether it also applies to anchor UEs.

Nokia think flexibility is important and anchor selection could happen at any time; we should not mandate a strict order of operations.

Intel think we should not specify how selection works, because the discovery procedure is out of RAN2 scope.

CATT would prefer to just reply directly that no criteria will be specified by RAN2 and we did not reach consensus on when the selection takes place.

OPPO think we can only provide the parameter list to SA2.

Apple indicate that it would be OK if SA2 specify server UE selection for us, but if they specify anchor UE selection it might be a problem, so they have some concern if we leave it all to SA2.

Lenovo note that some of the criteria are radio-based, and they are not sure if SA2 will know what specific measurements they relate to; they wonder if it is RAN work to figure that out.

Xiaomi think we can say RAN2 intend to leave it to UE implementation to select the anchors.

Sony wonder if we leave it to implementation, the AMF will need to deal with capabilities for the selected devices, and the LMF needs to inform the AMF to keep them. So they think something needs to be specified.

Xiaomi think how the LMF selects anchor UEs is left to LMF implementation.

Fraunhofer wonder if we leave the selection of anchor UEs to implementation, how the other UEs will know what needs to be reported, and some initial measurement is needed before we can make a selection on radio criteria. Xiaomi understand that this is more related to the information exchanged between target and anchors.

Intel think we do not need to discuss this, and we can just answer the first question that we will not specify either the selection procedure or when it happens. They think the selected UE(s) will be reported, but the algorithm for selecting them need not be specified.

InterDigital have a concern about leaving anchor selection to UE implementation: How would we support reselection cases?

Xiaomi think we do not need to repeat the discussion, since we already have an agreement that anchor reselection will not be specified.

Sony are concerned that SA2 could create RAN2 impact.

Huawei wonder if we make any agreement on the parameter list, where it will be reflected in the specs. Chair understands that it would be the discovery metadata; OPPO agree.

Fraunhofer think there could be parameters that would not be in the discovery metadata, e.g., LoS. Huawei have a similar concern about real-time information.

Agreement:

Tell SA2 that like anchor UEs, a normative requirement on which server UE to select (e.g., ranking) will not be specified, and RAN2 do not intend to specify when the selection takes place; we leave it to SA2 to determine whether to specify anything.

Proposal 2: RAN2 to further discussion which of the options to take for anchor/server UE selection:

Option 1: anchor/server UE selection is performed after discovery procedure.[6]

Option 2: anchor/server UE selection is performed after discovery procedure & capability exchange procedure;[7]

Option 3: anchor/server UE selection is performed after discovery procedure, and it is left to UE implementation to decide whether it is after capability exchange or not.[4]

Option 4: RAN2 will not specify exactly when the anchor/server UE selection will take place.[New added by rapporteur based on summary]

Proposal 3: (16/17) RAN2 will follow RAN1 agreement to support relative velocity in Rel-18.

Agreement:

RAN2 will follow RAN1 agreement to support relative velocity in Rel-18.

Proposal 4: (17/17) LMF can provide assistant information to UE. Details are FFS.

Proposal 5: RAN2 to discussion whether the list of candidate located UEs (specified in SA2) are provided through SLPP assistant data or SLPP location request.

Proposal 6: (15/17) Assistant information from LMF is not exposed to SA2.

Discussion:

CATT think SA2 did not ask about P5 and we should not increase the scope of the reply.

Xiaomi intend to confirm whether there is any assistance information that would impact the SA2 procedures, and maybe we should postpone the related LS to next meeting.

Sony also think it may impact SA2 if it makes things clearer for them, and they find P5 unclear as to who is providing the information to whom. OPPO also find P5 unclear; they think the question of whether to provide the list is decoupled from which message carries it.

Intel think companies assume the LMF will provide this information to the UE by analogy with LPP, and that is transparent to SA2.

vivo think the draft agreement is a general principle, but we need to determine what to reply to SA2.

Ericsson think we should answer the question that was asked.

Agreements:

Reply to SA2 that LMF can provide assistance information to UE in SLPP, which is not exposed to SA2.

* [Post123][404][POS] Reply LS to SA2 on assistance information (Xiaomi)

Scope: Reply to R2-2307056 in line with agreements of this meeting.

Intended outcome: Approved LS in R2-2309119

Deadline: Short (not for RP)

R2-2309119 (LS from [404]) Xiaomi LS out Rel-18 NR\_pos\_enh2 To:SA2

LS-related documents from non-contact companies

[R2-2308053](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2308053%20Discussion%20on%20the%20draft%20reply%20LSs%20to%20SA2%20on%20SL%20Pos.docx) Discussion on the reply LSs to SA2 on SL Positioning OPPO discussion Rel-18 NR\_pos\_enh2

Draft TS

[R2-2307663](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Docs\R2-2307663.zip) TS 38.355 v0.0.4 Intel Corporation draft TS Rel-18 38.355 0.0.4 NR\_pos\_enh2

Discussion:

Lenovo think this TS may not be stable enough to submit to plenary from this meeting.

Intel think we should follow the WI schedule and send the TS for information, but they agree it is not very developed yet.

Nokia think there should be post-meeting review time for the TS and the running CRs generally. Huawei agree that we will need post-meeting discussions to implement the agreements of this meeting.

* [AT123][409][POS] TS 38.355 (Intel)

Scope: Collect comments on the draft TS in R2-2307663 and produce an endorsable version, taking into account also discussion of the proposals in R2-2307662.

Intended outcome: Endorsable draft TS in R2-2309183 and report in R2-2309227

Deadline: Thursday 2023-08-24 2000 UTC

R2-2309183 TS 38.355 v0.0.5 Intel Corporation draft TS Rel-18 38.355 0.0.5 NR\_pos\_enh2

* Not provided (no comments received on v0.0.4)

R2-2309227 (Report from [409]) Intel Corporation discussion Rel-18 NR\_pos\_enh2

Running CRs

[R2-2307124](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2307124%20Draft%20running%20MAC%20CR%20for%20LPHAP_v02.docx) Running MAC CR for LPHAP Huawei, HiSilicon discussion Rel-18 NR\_pos\_enh2

[R2-2307125](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2307125%20Draft%20running%20MAC%20CR%20for%20sidelink%20positioning_v03.docx) Running MAC CR for Sidelink Positioning Huawei, HiSilicon discussion Rel-18 NR\_pos\_enh2

* [AT123][405][POS] Rel-18 positioning MAC CRs (Huawei)

Scope: Collect comments on the CRs in R2-2307124 and R2-2307125 and produce endorsable versions.

Intended outcome: Endorsable CRs in R2-2309179 and R2-2309180

Deadline: Thursday 2023-08-24 2000 UTC

R2-2309179 Running MAC CR for LPHAP Huawei, HiSilicon discussion Rel-18 NR\_pos\_enh2

R2-2309180 Running MAC CR for Sidelink Positioning Huawei, HiSilicon discussion Rel-18 NR\_pos\_enh2

[R2-2307391](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2307391%20LPP%20running%20CR%20for%20RAT-dependent%20integrity.docx) LPP running CR for RAT-dependent integrity CATT draftCR Rel-18 37.355 17.5.0 NR\_pos\_enh2

* [AT123][406][POS] Rel-18 LPP CR on RAT-dependent integrity (CATT)

Scope: Collect comments on the CR in R2-2307391 and produce an endorsable version.

Intended outcome: Endorsable CR in R2-2309181

Deadline: Thursday 2023-08-24 2000 UTC

R2-2309181 LPP running CR for RAT-dependent integrity CATT draftCR Rel-18 37.355 17.5.0 NR\_pos\_enh2

[R2-2308385](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2308385_(Running%20Stage%202%20CR).docx) Running Stage 2 CR for 'Expanded and improved NR positioning' Qualcomm Incorporated draftCR Rel-18 38.305 17.5.0 B NR\_pos\_enh2

[R2-2308386](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2308386_(Stage%202%20TP%20MT-LR%20MO-LR).docx) Stage 2 TP for SL-MO-LR/SL-MT-LR Qualcomm Incorporated discussion

[R2-2308387](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2308387_(Stage%202%20TP%20SLPP%20Transport%20Between%20UE%20and%20LMF).docx) Stage 2 TP for SLPP Transport between UE and LMF Qualcomm Incorporated discussion

[R2-2308395](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2308395_(Stage%202%20TP%20SLPP%20Transport%20Between%20UEs).docx) Stage 2 TP for SLPP Transport between UEs Qualcomm Incorporated discussion

* [AT123][407][POS] Rel-18 positioning stage 2 CR and TPs (Qualcomm)

Scope: Collect comments on the CR in R2-2308385 and related TPs in R2-2308386 / R2-2308387 / R2-2308395, and produce an endorsable version of the CR.

Intended outcome: Endorsable CR in R2-2309207

Deadline: Thursday 2023-08-24 2000 UTC

R2-2309207 Running Stage 2 CR for 'Expanded and improved NR positioning' Qualcomm Incorporated draftCR Rel-18 38.305 17.5.0 B NR\_pos\_enh2

[R2-2308484](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2308484%20RRCRappCR.docx) Rapporteur CR for Positioning RRC Changes Ericsson draftCR Rel-18 38.331 17.5.0 B NR\_pos\_enh2

* [AT123][408][POS] Rel-18 positioning RRC CR (Ericsson)

Scope: Collect comments on the CR in R2-2308484 and produce an endorsable version.

Intended outcome: Endorsable CR in R2-2309182

Deadline: Thursday 2023-08-24 2000 UTC

R2-2309182 Rapporteur CR for Positioning RRC Changes Ericsson draftCR Rel-18 38.331 17.5.0 B NR\_pos\_enh2

Rapporteur inputs on spec handling

[R2-2307662](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2307662%20SLPP%20considerations.docx) Further considerations on SLPP specification Intel Corporation discussion Rel-18 NR\_pos\_enh2

[R2-2308259](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2308259%20Discussion%20on%20R18%20positioning%20UE%20capabilities.doc) Discussion on R18 positioning UE capabilities Xiaomi discussion

* [AT123][410][POS] Rel-18 positioning capabilities (Xiaomi)

Scope: Discuss the proposals in R2-2308259 and conclude on handling of the Rel-18 capabilities.

Intended outcome: Report to CB session in R2-2309175

Deadline: Wednesday 2023-08-23 2000 UTC

[R2-2309175](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2309175%20Report%20of%20email%20discussion%20%5bAT123%5d%20%5b410%5d%20Rel-18%20positioning%20capabilities.docx) Report of email discussion [AT123][410][POS] Rel-18 positioning capabilities Xiaomi discussion

Proposal 1: The principle of UE capabilities for Rel-18 positioning WI follow the Rel-17 positioning WI, including:

• RAN1/4 feature groups related to RRC/TS38.306 should be captured in the Mega CRs directly;

• RAN1/4 feature groups related to LPP/SLPP should be captured in LPP/SLPP running CR directly;

• RAN2 determined UE capabilities for RRC/TS38.306 should be maintained in running UE capability CRs, and then it should be merged into the Mega CRs

• RAN2 determined UE capabilities for LPP/SLPP can be maintained in running UE capability CR and then it should be merged into LPP/SLPP running CR, or the RAN2 determined UE capabilities can be captured in LPP/SLPP running CR directly. It depends on the coordination between SLPP, LPP and capability rapporteurs.

Discussion:

Chair thinks this is business as usual; Qualcomm have some concern with the proposed LPP/SLPP handling and would prefer to handle the capabilities in the LPP/SLPP CRs directly.

Lenovo think it is useful to separate the capabilities for LPP/SLPP as well, because of large numbers of feature groups, but they can accept leaving it to the running CR rapporteurs.

Intel think for RRC/306 it is clear that it should be a separate CR, and they have no strong view on LPP/SLPP.

Lenovo note that in Rel-17 we received feature groups gradually and had to introduce them step by step.

Proposal 2: RAN2 leads the discussion on RAN2 related positioning capability for RAN2 lead items ‘RAT-dependent positioning integrity’ and ‘LPHAP’, and the final UE capability agreed in RAN1/RAN4 for ‘RAT-dependent positioning integrity’ and ‘LPHAP’ should be double-checked and confirmed by RAN2.

Proposal 3: For SL positioning, the existing RAN2 related LPP capability can be used as starting point for discussing of RAN2 related SLPP capability, FFS the detailed capabilities.

Discussion:

Intel note that there may be capabilities that overlap between RRC and LPP/SLPP, and the rapporteurs should check for alignment (names, etc.)

Proposal 4: Introduce the LPP capabilities for RAT dependent positioning integrity, and the detailed capabilities can be checked in the LPP running CR.

Proposal 5: For LPHAP, introduce LPP capability on ‘SRS with validity area’ and ‘preconfigured SRS’, the detailed capabilities may be introduced by RAN1. And the LPP capabilities on PRS DRX alignments are FFS.

Proposal 6: For LPHAP, introduce RRC capability on ‘SRS with validity area’ and ‘preconfigured SRS’, the detailed capabilities may be introduced by RAN1.

Agreements:

RRC/38.306 capabilities are captured separately and merged into the mega CRs as usual (both RAN1/RAN4 and RAN2 capabilities).

RAN1/4 feature groups related to LPP/SLPP should be captured in LPP/SLPP running CR directly.

RAN2 determined UE capabilities can be captured in LPP/SLPP running CR directly. Feature list will be captured and maintained as usual.

CR rapporteurs are asked to check for consistency where capabilities overlap between RRC and LPP/SLPP.

Other

### 7.2.2 Sidelink positioning

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

Including report of [Post122][402][POS] SLPP session handling (Intel)

Email discussion summary

[R2-2307660](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2307660%20%5bPost122%5d%5b402%5d%5bPOS%5d%20SLPP%20session%20handling.docx) Report of [ 402] SLPP session handling Intel Corporation discussion Rel-18 NR\_pos\_enh2 Late

Proposal 1: For LMF involved SL based positioning, follow SA2 on how to handle LMF involved SL based positioning between UE (who has connection with network), LMF and AMF. FFS on how to handle session for UEs involved in the same LMF involved SL based positioning and the relationship between routing ID/correlation ID and session ID.

Discussion:

Ericsson think following SA2 is fine, but the FFSs may be possible to resolve. They understand that when the LMF is initiating the session it can assign the session ID. Huawei think this may not be possible for the SLPP session ID, but the routing ID and correlation ID can be assigned by the LMF as usual. Huawei think we could follow the UE-only case.

Intel suggest postponing the discussion on the FFS aspects until we handle the summary below and determine if we have conclusions.

Lenovo are OK in principle with the proposal, but they wonder if SA2 will do anything further without prompting from us; they should be into the maintenance phase. They think we may need to update SA2 about our status.

Qualcomm do not see SA2 impact from these aspects. They understand the LMF can only talk to one UE, and the question is whether the LMF also needs to see a second SLPP session ID between the UEs; this is a RAN2 question. Huawei agree with Qualcomm and think the SLPP session ID only needs to be used between UEs; it should have no SA2 impact.

Ericsson also agree that there is no SA2 impact. They think that at least for the SL MT-LR case, the LMF needs to know what session it needs to get measurement results from; they agree that some more discussion is needed.

Intel think we should focus on the proposal instead of expanding the discussion. They have not identified SA2 impact and think we can continue discussion, with the understanding that we will notify SA2 if something comes up.

CATT think on Ericsson’s comment, the handling depends on the solution for the session between the LMF and the UE. They agree with Intel that we can follow the overall SA2 procedure, and they do not think an SLPP session ID is required between the UE and the LMF.

vivo think SA2 may have some impact from RAN2 decisions; the anchor UE can distinguish different sessions by the correlation ID or routing ID, but if there are different correlation IDs for different SLPP sessions, then the SLPP session ID is not needed between LMF and anchor UE.

Proposal 2: RAN2 should focus on single target scenario and will continue the discussion on multiple target UEs, and broadcast/groupcast once the basic functionality has been defined.

Discussion:

OPPO think SA2 have already covered multiple targets with SL MT-LR, and they do not see the RAN2 impact of supporting it. Huawei agree; from RAN2 perspective, there may be only stage 2 description for multiple targets and for broadcast/groupcast.

Huawei point out that SA3 are still working on the security aspects, and this might be the bottleneck for groupcast.

Xiaomi see some misunderstanding between RAN2 and SA2: SA2 have specified one target UE and multiple reference UEs, and for multiple target UEs they have not specified any detailed procedures, although they may address it this meeting cycle. They think we can at least discuss groupcast/broadcast.

Intel see different understandings from companies about SA2 status, and the intention of the proposal is that we focus our discussion on the basic procedure with one target and unicast first.

Nokia agree with Intel: The proposal does not preclude multiple target UEs, it just prioritises where we focus our time. Ericsson agree.

Qualcomm think there is some support in SA2 for multiple target UEs, although it is not complete through all specs. They do not consider single target/unicast to be the basic functionality, because SL positioning always involves multiple UEs, and unicast is just a transport option that may not affect SLPP. If such a prioritisation is needed, they would like to delete the second half of the proposal.

Xiaomi understand that there is a preference to focus on the stage 3 impact.

Proposal 3: For UE-only operation, introduce explicit field “sessionID” in SLPP, and put it under message header of SLPP message. FFS how session ID is defined

Discussion:

OPPO think LPP embeds the session ID in the NAS layer, and for SLPP maybe we should follow the legacy behaviour and use the V2X/ProSe layer below SLPP. Intel indicate that the reason they propose to include it in SLPP is to avoid relying on other groups to specify the ID and inter-layer interaction to use the session ID at the UE.

Huawei think we have already supported UP transport without using PC5-S as a carrier.

Apple support the proposal and think it would be convenient to have the ID in our specs.

vivo think the proposal is OK, and the suggestion from OPPO does not work because we do not have the V2X/ProSe layer. OPPO understand there is a layer to map the service data to QoS flows, and they think there is also such a layer here; they are OK to check the protocol layers and decide later.

Ericsson agree with the proposal and think it will simplify things to have the ID in SLPP; they think there was a preference for a unified solution between network-based and UE-only operation.

CATT support the proposal; they understand that the LMF has a session ID, but there is no legacy session ID between UE and LMF, and in the SLPP case we need to identify the sessions between UEs.

Qualcomm also support the proposal and think SLPP should be self-contained as much as possible.

CEWiT see the benefit of having the session ID in the message.

ZTE also support the proposal; regarding network-based operation, they think there is still a case where UEs need to exchange SLPP, and the session ID will be needed there.

Proposal 4: (10 vs 8) For UE-only operation, RAN2 will continue the discussion on whether “sessionID” is applied for groupcast/broadcast once the basic functionality has been defined.

Proposal 5: (13 vs 4 ) from SLPP perspective, the UE who receives the] LCS request at least needs to:

- Initiate the SLPP procedure;

- Assign the sessionID, and include it in the SLPP messages (Rx side should use the received sessionID for messages in the same positioning session);

Discussion:

Huawei think there should be no session ID for broadcast. Intel think we can continue discussion on broadcast, but we do not have time to fully discuss it online now.

vivo think we need to scope this as “at least for UE-only operation”. Intel think this was the intention.

Huawei would like to understand if there is spec impact. Intel think we should capture the assignment of the session ID. CATT agree with Intel and think we need to reach a common understanding about the procedure; this proposal aligns with SA2.

Huawei think there is no SA2 guidance on which end initiates the SLPP procedure.

Nokia think this does not clarify the scope of uniqueness of the ID, and maybe we could capture that this aspect will be further looked at.

vivo think it is not clear what happens if the target and server UEs are different; they see that in this case two UEs could receive the LCS request. They would prefer to clarify that the server UE performs the allocation. Intel indicate there was no consensus on this point.

Qualcomm think we are repeating a discussion, and the proposal has nothing wrong with it; if it later turns out that it must be a server UE, we can clarify that.

CATT agree with Intel and Qualcomm; we are talking about UEs here irrespective of different roles. They see the proposal as a good way forward.

OPPO agree with the proposal and think the server UE definition does not imply such a function.

Proposal 6: (15 vs 1 ) if the UE who receives the LCS request can act as the SL Positioning Server UE, then the UE shall trigger following procedures with each of UEs (UE2-UEn in the figure) in the SLPP session:

- SL Positioning Capability Transfer procedure,

- SL Location Information Transfer (FFS on who decide positioning method) and

- SL Positioning Assistance Data exchange (depends on RAN1 discussion on how to select the PRS resources)

Proposal 7: (11 vs 2 ) In stage 3 specification, use "Tx Endpoint" and "Rx Endpoint(s) to describe the procedure instead of target UE, anchor UE and server UE concept, e.g. [figure omitted]

Discussion:

Lenovo wonder why we need “Tx” and “Rx”. Qualcomm clarify it came from 38.300, and they think it is helpful to show which side initiates the procedure without tying it to UE roles.

Apple would prefer not to have the Tx and Rx language.

CATT think we should clarify SLPP Tx/Rx vs. SL-PRS Tx/Rx.

Xiaomi note that the transmitter of one operation may be the receiver of another, so the Tx/Rx terminology may not be clear.

ZTE think in stage 3, we always have the SLPP Tx/Rx, not the SL-PRS Tx/Rx. So they think Tx/Rx can be kept.

Proposal 8: Reuse LPP session management as a start, and we may revisit it if any issue is found.

Discussion:

Intel clarify the intention is to avoid introducing new session management procedures.

Qualcomm do not think we need an agreement in this direction and there is no clear definition of LPP session management. They see benefit from having explicit session start/end.

Lenovo agree with Qualcomm’s comment and think it is related to session release at the UE. We have not discussed how many sessions a UE can support.

Xiaomi agree with Qualcomm and think we could have an FFS on the session release.

CATT wonder what the stage 3 impact for session start/release is.

Nokia think the proposal does not have a big impact.

Agreements:

For LMF involved SL based positioning, follow SA2 on how to handle LMF involved SL based positioning between UE (who has connection with network), LMF and AMF. FFS on how to handle session for UEs involved in the same LMF involved SL based positioning and the relationship between routing ID/correlation ID and session ID.

At least for UE-only operation, introduce explicit field “sessionID” in SLPP, and put it under message header of SLPP message. FFS how session ID is defined.

At least for UE-only operation, the UE who receives the LCS request at least needs to:

- Initiate the first SLPP procedure;

- Assign the sessionID, and include it in the SLPP messages (Rx side should use the received sessionID for messages in the same positioning session).

FFS within what scope the session ID is unique.

At least for UE-only operation, if the UE who receives the LCS request can act as the SL Positioning Server UE, then the UE shall trigger following procedures with each of UEs (UE2-UEn in the figure) in the SLPP session:

- SL Positioning Capability Transfer procedure,

- SL Location Information Transfer (FFS on who decide positioning method) and

- SL Positioning Assistance Data exchange (depends on RAN1 discussion on how to select the SL-PRS resources)

In stage 3 specification, use "Endpoint A" and "Endpoint B” to describe the procedure instead of target UE, anchor UE and server UE concept, e.g. [figure omitted]

Agenda item summary (excluding items related to the email discussion)

[R2-2308973](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2308973%20%5bPre123%5d%5b402%5d%5bPOS%5d%20Summary%20of%20AI%207.2.2%20on%20sidelink%20positioning%20(CATT).docx) Summary of AI 7.2.2 Sidelink positioning CATT discussion Rel-18 NR\_pos\_enh2

[Scenario aspect]

Proposal 3: RAN2 to apply terms of “UE-only Operation” and “Network-based Operation” defined in TS 23.586 by SA2 for SLPP procedures.

Discussion:

Lenovo wonder why network-assisted operation is not included. CATT indicate that the terms are not intended to be exclusive, and they understand that SA2’s “network-assisted operation” just means UE-based positioning in our terms; they see it as not relevant to the scenario issues.

Huawei agree with Lenovo and think we should capture the network-assisted term.

OPPO checked the SA2 spec and found that UE-only operation only applies when the network is not involved, so this is not related to UE-based/UE-assisted.

Xiaomi think we should follow the SA2 terminology.

Proposal 4: RAN2 to discuss how to capture the cases of “UE-only Operation” and “Network-based Operation” in stage-2 specification. The following definition can be as baseline:

Network-based operation:

- Case 1: at least one of a UE has NAS connection, and 5GC supports SL positioning.

• Case 1-1: both target UE and all anchor UEs have NAS connection; (in-coverage)

• Case 1-2: target UE has NAS connection, and at least one of anchor UE does not have NAS connection; (partial-coverage)

• Case 1-3: target UE does not have NAS connection, while at least one of the anchor UEs has NAS connection; (partial-coverage)

UE-only operation:

- Case 2: none of the UE has NAS connection; (out-of-coverage)

- Case 3: target UE has NAS connection, but SL-MO-LR request is rejected by the network. (in-coverage)

Discussion:

Lenovo think per SA2 specs, there is a missing case 4: UE is configured by NW to allow UE-only operation.

Intel wonder if we need to care about these cases in RAN2; we need to specify SLPP, and the scenarios are more in SA2 scope. Qualcomm agree with both Intel and Lenovo; they think it is not complete and does not impact our work. Nokia agree as well.

ZTE think P4 is useful for progressing the stage 2, but we should not have the brackets with the coverage scenarios.

Xiaomi understand the motivation for capturing something in stage 2, but they think there are additional SA2 criteria that are not captured here.

Apple are not sure what the purpose of the scenarios is in light of the next proposal; they also have some concerns with the language.

CATT indicate the intention is just to get a common understanding of the coverage scenarios.

Nokia think we are repeating SA2 discussions; the LMF is used if a UE can reach the LMF.

Proposal 5: RAN2 can prioritise to discuss in-coverage and out-of-coverage sidelink positioning cases. The additional functionality for partial-coverage cases can be revisited if time allows.

Discussion:

InterDigital think partial coverage should be considered.

Xiaomi think we should look at the stage 3 impacts, and if we can support partial coverage without extra work it is OK. They do not see differences so far.

Intel think it is related to forwarding messages from other UEs.

Apple support P5 and think we should look at what is realistic to support.

Nokia think we should not divide the work into subcases but try for a unified design that covers seamlessly.

Huawei understand SA2 have already supported the partial coverage scenario, and they do not identify RAN2 impact. They wonder why RAN2 should veto another group’s decisions. They understand that it is only related to MO-LR.

OPPO think whether to treat partial coverage depends on how big the delta is. They see the delta as identifying the relay point for the UEs out of coverage and potentially using sidelink relay to forward the messages; they are not sure how big the impact is as a whole.

Qualcomm agree with Huawei; from a procedural point of view, they think partial coverage is the same as out of coverage.

Intel support the proposal and agree that we would need to identify the impact; they see that there is a concern with the amount of time left and we need to prioritise. MediaTek agree with Intel.

CATT clarify that the intention is not to exclude partial coverage but to prioritise.

vivo agree with Intel and think this is related to forwarding of messages. We would have to design a forwarding mechanism for out of coverage UEs.

Ericsson think we could use UE-to-network relay. Huawei think this could be used as transport for the out-of-coverage UEs and it would be transparent from the positioning pov. To vivo’s comment, they think we need to identify what the required changes are.

InterDigital think the anchor UE can forward messages for an out-of-coverage target UE, and if we reuse the UE-to-network relay there would be no extra impact. Chair wonders if we would assume that all SL positioning UEs support relaying.

Xiaomi point out that even for in-coverage, forwarding may be needed, because some of the anchor UEs may not be served by the same LMF, and in this case one UE will forward the information from those anchor UEs.

Nokia also agree that forwarding is needed.

Qualcomm are not prepared to agree to the forwarding capability; they see it as a corner case. Their understanding of the SA2 specs is that the LMF talks to one UE and that UE instigates the SLPP sessions.

CATT found there are two candidate solutions: sidelink relay and SLPP message forwarding. Their concern is finalising the procedures for the in-coverage and out-of-coverage procedures.

Huawei point out that SA2 are not considering sidelink relay but the case where an “OOC” UE does not have a NAS connection.

Apple agree with Qualcomm.

Ericsson agree with Huawei and think we do not need a new mechanism for forwarding.

Qualcomm think the LMF in any case will only talk to a single UE. They think we could take the original proposal, and they understood the intention was to exclude SLPP PDU forwarding, but they think forwarding of information from UEs to the LMF is required by the SA2 design.

Qualcomm think PDU forwarding between the LMF and a non-connected UE is not feasible.

Lenovo think the “forwarding” involves additional information added to the forwarded message.

Apple think the forwarding is not completely clear, e.g., in what happens with the session IDs.

Agreement:

RAN2 to apply terms of “UE-only Operation” and “Network-based Operation” defined in TS 23.586 by SA2 for SLPP procedures.

* [AT123][429][POS] UEs without connection to LMF and SLPP forwarding (Apple)

Scope: Discuss the need for support of communication with UEs that do not have a direct connection to the LMF (e.g., no NAS connection) and potential need for a forwarding mechanism in SLPP. Sidelink relay is not considered in this discussion.

Intended outcome: Report to CB session in R2-2309171

Deadline: Thursday 2023-08-24 2000 UTC

[Discovery related including information and procedures]

Proposal 8: RAN2 to discuss whether define the individual metafield structures separately for different discovery messages (Announcement message, Solicitaion message and Response message).

Proposal 9: RAN2 to discuss following parameters can be included in the metadata in the discovery message:

1) Supported sidelink positioning methods; (CATT,vivo, Xiaomi, Intel, OPPO, CMCC)

2) In coverage or not; (CATT, Xiaomi, Philips)

3) Location; (CATT,vivo, Xiaomi, Spreadtrum, CMCC)

4) PLMN; (CATT，Xiaomi)

5) Stationary or movable; (CATT,vivo, Xiaomi)

6) Location accuracy; (Xiaomi，Philips)

7) Filter condition: e.g. Requested SL positioning methods, Low Mobility required, In coverage required, LOS path required, Location accuracy requirement, PLMN, required QoS requirement; (Nokia, vivo, Xiaomi, OPPO, Ericsson)

8) Supported positioning QoS requirement(s); (OPPO, Ericsson)

9) SLPP support; (Lenovo, CMCC)

[Anchor UE selection]

Proposal 10: RAN2 to discuss who performs anchor UE selection: LMF/server UE or target UE.

Proposal 11: Anchor UE selection bases on information from discovery procedure and the positioning capability exchange procedure.

[Server UE selection]

Proposal 12: The SL positioning server UE can be either co-located in a target UE/anchor UE, or operated by a separate UE.

Proposal 13: The following parameters can be considered for SL positioning server UE selection:

1) Supported roles of UE (SL positioning server UE)

2) Supported sidelink positioning methods

3) RSRP

4) Stationary or movable

* [AT123][430][POS] Discovery and selection for sidelink positioning (CATT)

Scope: Discuss further on P8/P9/P10/P11/P12/P13 of R2-2308973 and progress toward agreements.

Intended outcome: Report to CB session in R2-2309172

Deadline: Thursday 2023-08-24 2000 UTC

[SLPP Reliable transport]

Proposal 21: SLPP over PC5-U supports reliable transport for groupcast.The same principles of LPP reliable transport (including duplicate detection, acknowledgement and message retransmissions) shall be used for SLPP.

[SL-PRS resources allocation and request]

Proposal 23-1: RAN2 to discuss UE how to request sidelink resource in Scheme 1 for SL-PRS transmission, including allocation from gNB by CG and DG:

- When SL-PRS transmission is triggered for the UE configured with Scheme1 SL-PRS resource allocation by configured grant, the UE sends an RRC message to the gNB for SL-PRS transmission. The UE sends a CG confirmation MAC CE when the DCI for CG type 2 activation/deactivation is successfully received.

- When SL-PRS transmission is triggered for the UE configured with Scheme1 SL-PRS resource allocation by dynamic grant, the UE sends a MAC CE to the gNB for SL-PRS resource request. SR can be triggered for SL-PRS resource allocation request MAC CE when there is no UL-SCH resources to accommodate the MAC CE.

Send LS to RAN1 to confirm the mechanism and detailed content in the MAC CE if required.

Proposal 23-2: RAN2 to discuss how to select a dedicated SL resource pool or a shared SL resource pool and agree the below rules to align with RAN1 agreement:

- When there are both sidelink data and SL-PRS pending for transmission, select shared resource pool.

- When there are only SL-PRS pending for transmission while there is no data, prioritize dedicated resource pool

- For shared resource pool, all the legacy conditions for resource selection/reselection can be reused.

Proposal 23-3: RAN2 to support CBR measurement on both shared and dedicated resource pool for SL-PRS transmission, FFS how to report CBR in line with RAN1 progress.

[SL-PRS priority]

Proposal 22: RAN2 determines an SL-PRS priority value for SL-PRS, given defined SL positioning QoS (5/8). UE’s own higher layer provides this value of SL-PRS priority to its physical layer. There is no RAN2 impact when the SL-PRS priority value is provided by the SCI from the peer UE triggering the SL-PRS transmission. RAN2 to send the agreement to RAN1 for confirm and inform SA2.

[MAC issues]

Proposal 25: RAN2 discuss if there is a MAC specification impact for the case that only SL-PRS transmission in a shared resource pool when the UE may not have data available for transmission.

Proposal 26: RAN2 further discuss the MAC issues when SL-PRS transmission in share resource pool, including the destination selection and how to handle the SL-PRS priority and SL-SCH priority, in line with RAN1.

Proposal 27: RAN2 further discuss the MAC issues of P12, P13, P14, P15, P17 in R2-2307123.

* [AT123][431][POS] Sidelink positioning MAC issues (Huawei)

Scope: Progress discussion on P22/P23-x of R2-2308973 (possible extension to post-meeting discussion), prioritising topics related to SL resource allocation.

Intended outcome: Report to CB session in R2-2309173

Deadline: Thursday 2023-08-24 2000 UTC

R2-2309171 (Report from [429]) Apple discussion Rel-18 NR\_pos\_enh2

R2-2309172 (Report from [430]) CATT discussion Rel-18 NR\_pos\_enh2

R2-2309173 (Report from [431]) Huawei discussion Rel-18 NR\_pos\_enh2

The following documents will not be individually treated

[R2-2307122](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2307122%20Discussion%20on%20higher%20layer%20aspects%20for%20Sidelink%20Positioning_final.docx) Discussion on higher layer aspects for Sidelink Positioning Huawei, HiSilicon discussion Rel-18 NR\_pos\_enh2

[R2-2307123](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2307123%20Discussion%20on%20lower%20layer%20aspects%20for%20SL%20positoining_v06.docx) Discussion on lower layer aspects for Sidelink Positioning Huawei, HiSilicon discussion Rel-18 NR\_pos\_enh2

[R2-2307185](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2307185_Sidelink_Fraunhofer.docx) UE Positioning using Sidelink in OoC Fraunhofer IIS, Fraunhofer HHI discussion

[R2-2307187](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2307187_Preconfigured_AD_Sidelink_Fraunhofer_Ericsson.docx) Preconfigured Assistance Data for UE Positioning in Hybrid Uu and PC5 scenarios Fraunhofer IIS, Fraunhofer HHI, Ericsson discussion

[R2-2307232](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2307232.docx) Discussion of SLPP / LPP signalling procedures Nokia Netherlands discussion Rel-18

[R2-2307241](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2307241.docx) Discussion of session-less and session-based positioning Nokia Netherlands discussion Rel-18

[R2-2307340](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2307340.docx) SLPP signalling in UE-only sidelink positioning/ranging procedure MediaTek Inc. discussion Rel-18 NR\_pos\_enh2

[R2-2307341](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2307341.docx) Pathological cases of network-based operation for sidelink positioning MediaTek Inc. discussion Rel-18 NR\_pos\_enh2 Revised

[R2-2307392](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2307392%20Discussion%20on%20sidelink%20positioning.docx) Discussion on sidelink positioning CATT discussion Rel-18 NR\_pos\_enh2

[R2-2307426](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2307426%20Discussion%20on%20sidelink%20positioning.docx) Discussion on sidelink positioning vivo discussion Rel-18 FS\_NR\_pos\_enh2

[R2-2307507](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2307507%20Discussion%20on%20SL%20positioning.doc) Discussion on SL positioning Xiaomi discussion Rel-18

[R2-2307661](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2307661.docx) Further considerations on sidelink positioning Intel Corporation discussion Rel-18 NR\_pos\_enh2

[R2-2307778](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2307778%20(7.2.2)%20SLPP%20design%20in%20session%20aspects.docx) SLPP design for session aspects Samsung Electronics Romania discussion

[R2-2307823](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2307823-SL-POS-procedures-v0.docx) SL positioning procedures Apple discussion NR\_pos\_enh2

[R2-2308052](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2308052%20Further%20discussion%20on%20sidelink%20positioning.docx) Further discussion on sidelink positioning OPPO discussion Rel-18 NR\_pos\_enh2

[R2-2308125](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2308125%20Discussion%20on%20sidelink%20positioning.docx) Discussion on sidelink positioning Spreadtrum Communications discussion Rel-18

[R2-2308138](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2308138%20Discussion%20on%20sidelink%20positioning.docx) Discussion on sidelink positioning ZTE Corporation discussion Rel-18 NR\_pos\_enh2

[R2-2308152](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2308152_SL_Pos_Res.docx) Considerations on sidelink positioning resources Sony discussion Rel-18 FS\_NR\_pos\_enh2

[R2-2308276](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2308276_SLPosDiscussion.docx) Discussion on SL Positioning Lenovo discussion Rel-18

[R2-2308284](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2308284%20Bosch_Discussion_on_sidelink_positioning.docx) Discussion on sidelink positioning ROBERT BOSCH GmbH discussion Rel-18

[R2-2308316](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2308316%20Considerations%20on%20Sidelink%20positioning.doc) Considerations on Sidelink positioning CMCC discussion Rel-18 NR\_pos\_enh2

[R2-2308384](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2308384%20(R18%20NR%20POS%20A722%20SL%20POS).docx) Discussion on sidelink positioning InterDigital, Inc. discussion Rel-18 NR\_pos\_enh2

[R2-2308396](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2308396_(Sidelink%20Positioning).docx) Sidelink Positioning Protocol (SLPP) Signaling and Procedures Qualcomm Incorporated discussion

[R2-2308416](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2308416.docx) Pathological cases of network-based operation for sidelink positioning MediaTek Inc., CATT discussion Rel-18 NR\_pos\_enh2 R2-2307341

[R2-2308480](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2308480%20Sidelink%20positioning.docx) Sidelink positioning Ericsson discussion Rel-18

[R2-2308557](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2308557.docx) Discussion of resource allocation aspects Nokia Netherlands discussion

[R2-2308595](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2308595%20Discussion%20on%20higher%20layer%20aspects%20for%20sidelink%20positioning.docx) Discussion on higher layer aspects for sidelink positioning LG Electronics Inc. discussion Rel-18

[R2-2308600](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2308600%20Discussion%20on%20lower%20layer%20aspects%20for%20sidelink%20positioning.docx) Discussion on lower layer aspects for sidelink positioning LG Electronics Inc. discussion Rel-18

[R2-2308657](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2308657%20Discussion%20on%20priority%20value%20for%20SL-PRS.doc) Discussion on priority value for SL-PRS Samsung Electronics Co., Ltd discussion Rel-18 NR\_pos\_enh2

[R2-2308800](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2308800-Further%20Discussions%20on%20Sidelink%20Positioning%20and%20Ranging.docx)  Further Discussions on Sidelink Positioning & Ranging CEWiT discussion

[R2-2308884](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2308884%20Discussion%20on%20Anchor%20UE%20discovery%20and%20selection%20in%20sidelink%20positioning.docx) Discussion on Anchor UE discovery and selection in sidelink positioning KT Corp. discussion Rel-18 NR\_pos\_enh2

[R2-2308908](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2308908_On%20the%20selection%20of%20Anchor%20UEs%20for%20Sidelink%20Positioning.doc) On the selection of Anchor UEs for Sidelink Positioning Philips International B.V. discussion Rel-18 NR\_pos\_enh2

[R2-2308935](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2308935%20SL%20pos%20server.docx) On the support of UE-only SL positioning in in-coverage and partial coverage scenarios Philips International B.V. discussion Rel-18 NR\_pos\_enh2

### 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.

[R2-2308397](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2308397_(integrity).docx) Integrity of NR Positioning Technologies Qualcomm Incorporated discussion

Proposal 1: The DNU flags are provided per TRP and per error contribution (e.g., TRP location, RTD, beam information, etc.) in a new IE NR-Integrity-ServiceAlert.

Discussion:

CATT think in the RAT-independent case, the DNU flag indicates whether the corresponding AD can be used for integrity. Here we agreed that the AD for integrity will be separate from the AD for location calculation, so why do we need the DNU flag?

Qualcomm understand that the integrity AD will be integrated into the existing AD, and the DNU flags are needed because they go into the equations from the principle of operation. They understood we had an agreement to have the DNU flags. Ericsson agree with Qualcomm.

Nokia wonder if the beam information depends on P6. Qualcomm confirm it does.

Xiaomi understand if any error source for the TRP is in DNU condition, the whole TRP should not be used, so they assume the DNU flag per TRP is enough.

vivo are generally fine with proposal 1 and agree that we already concluded we have the DNU flags.

ZTE agree with the proposal. Lenovo also agree but wonder if we should add “per positioning method”.

Qualcomm indicate that the error contributions are method-independent in the current running CR, though of course certain measurements are used for certain methods.

Huawei think the same PRS resource can be used for different positioning methods at the same time, and they agree that we do not need to define the flags per positioning method.

Proposal 2: DNU flags for TRP/UE positioning measurements are not needed.

Proposal 3: Analogous to GNSS, the mean and standard deviation of rate error bounds can optionally also be provided for the NR positioning error sources.

Discussion:

CATT understand the LMF does not provide the rate error to the UE, so they are unsure how it can provide the bounds. Qualcomm indicate that the UE can infer the rate from multiple AD messages and the LMF can indicate the bound of the drift, but they understand it is a bit second-order information. CATT think in Rel-16, there is no error rate report from gNB to LMF, and we would need that as well for the proposal to work.

Qualcomm think there could be LPP impact but there should not be NRPPa impact; the LMF calculates the RTD and the drift.

Ericsson think we could think further on it.

ZTE do not think this is critical for Rel-18.

Proposal 4: The 'Integrity Correlation Times', defining the minimum time interval beyond which two sets of assistance data parameters for a given error can be considered to be independent from one another, can optionally be provided for the integrity assistance data.

Discussion:

CATT indicate that we agreed that in principle the AD are inherited from GNSS, and this is already reflected in the running CR; they support the proposal.

Proposal 5: Confirm the Working Assumption: "It is left to LMF implementation to decide the measurement error source bound distribution based on the measurement results from UE and/or NG-RAN."

Discussion:

Ericsson understand that if the UE cannot decide error bounds by itself, UE-based positioning with integrity will not work, but it does work for GNSS. They wonder if there is any specific condition that the UE needs to meet to determine the error source bound distribution.

Qualcomm agree that the UE knows its own state, but the output of the UE is just the raw measurements, and if the UE reports something further to the network to fit the integrity algorithm, we need to specify what the network would expect from the UE and how it would be used; with the WA it can be left to implementation/deployment.

OPPO understood the intention was for UE-assisted, and it is natural for the LMF to derive the result; maybe the proposal should be scoped this way.

CATT indicate that the WA is related to the error source, and RAN1 confirmed no problem with the WA, so they think RAN2 can align.

InterDigital agree with Qualcomm; the LMF is receiving the measurements and determining the location of the UE.

Intel also agree that the WA can be confirmed.

Proposal 6: The beam related information (Beam Bore-Sight Direction/Beam Antenna Information) are error sources for DL-AoD positioning.

Discussion:

vivo understand that RAN1 should identify the error sources; they think if RAN1 cannot make a decision, RAN2 can decide whether to support integrity for DL-AoD, and they would prefer not to support it.

OPPO think if RAN1 cannot achieve consensus on this, they cannot model the error and it would be better not to support it.

Ericsson think RAN1 have been trying to model the error, but they think it should ultimately be a gaussian distribution, and they think we should capture the beam information as error sources.

ZTE think if RAN1 do not clearly say “yes”, it means “no”. Huawei agree.,

InterDigital indicate that RAN1 could not reach consensus because of a split in company views, with one group arguing that the error information will not be provided. They do not see it as a technical issue, and they think DL-AoD integrity can still be supported based on TRP location as an error source.

Xiaomi indicate that RAN1 said they could not resolve it, so they think RAN2 should not support it.

CATT think we should follow RAN1 and not include it.

Intel indicate there was no agreement/consensus in RAN1, and they think we should not repeat the discussion here; if there is no RAN1 conclusion, we do nothing.

Qualcomm point out that RAN1 did not make the decision not to include it; their reply LS said they could not reach consensus for UE-based, which could imply that it is an error source for UE-assisted. They think it is obvious that this is an error source given how DL-AoD works, but the question is whether the network could obtain it.

Nokia do not fully understand why RAN1 could not reach consensus, but if the concern is that the LMF may not have access to the information, they wonder if we in RAN2 have a better understanding of how the LMF can obtain it.

Ericsson think it is not clear what the process to estimate this uncertainty would be; it may be outside both RAN1 and RAN2 expertise. They wonder if there are technical arguments that this is not an error source or not needed.

Qualcomm understand that the error bounds would be determined with a reference receiver like a PRU, like RTD error. They think the problem may be limited RAN1 time on the problem.

OPPO think in cases without PRUs, which may be typical, the error distribution cannot be derived, and if the use cases are limited, it may not be important to support.

Ericsson think the information can be provided optionally, so the LMF sends it only if it has it; from the device perspective, if it receives an angle and cannot validate it, it would be difficult to do integrity for DL-AoD.

CATT wonder if there is RAN3 impact to derive the error bound. Ericsson do not see any.

Qualcomm think to OPPO’s comment that integrity in general will not work without some form of reference receiver.

Agreements:

The DNU flags are provided per TRP and per error contribution (e.g., TRP location, RTD, beam information, etc.) in a new IE NR-Integrity-ServiceAlert.

DNU flags for TRP/UE positioning measurements are not needed.

The 'Integrity Correlation Times', defining the minimum time interval beyond which two sets of assistance data parameters for a given error can be considered to be independent from one another, can optionally be provided for the integrity assistance data.

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

The beam related information (Beam Bore-Sight Direction/Beam Antenna Information) are error sources for DL-AoD positioning. FFS if RAN2 support signalling this information.

[R2-2308260](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2308260%20Discussion%20on%20RAT-dependent%20positioning%20integrity.doc) Discussion on RAT-dependent positioning integrity Xiaomi discussion

Proposal 3 [partial]: We suggest confirm the working assumptions:

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

Agreement:

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

[R2-2307393](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2307393%20Discussion%20on%20RAT-Dependent%20integrity.docx) Discussion on RAT-Dependent integrity CATT discussion Rel-18 NR\_pos\_enh2

[R2-2307427](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2307427%20Discussion%20on%20remaining%20issues%20for%20positioning%20integrity.docx) Remaining issues of RAT-dependent integrity vivo discussion Rel-18 FS\_NR\_pos\_enh2

[R2-2307664](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2307664%20Integrity.docx) Further considerations on RAT dependent integrity Intel Corporation discussion Rel-18 NR\_pos\_enh2

[R2-2307999](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2307999%20Discussion%20on%20RAT-dependent%20integrity.doc) Discussion on RAT-dependent integrity Lenovo discussion Rel-18

[R2-2308050](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2308050%20Consideration%20on%20RAT-dependent%20positioning%20integrity.docx) Consideration on RAT-dependent positioning integrity OPPO discussion Rel-18 NR\_pos\_enh2

[R2-2308136](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2308136%20Discussion%20on%20RAT-dependent%20methods%20positioning%20integrity.docx) Discussion on RAT-dependent methods positioning integrity ZTE Corporation discussion Rel-18 NR\_pos\_enh2

[R2-2308482](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2308482%20RAT%20dependent%20Integrity.docx) On RAT-dependent positioning Integrity Ericsson discussion Rel-18

[R2-2308616](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2308616%20(R18%20NR%20POS%20A723%20RAT%20dependent%20integrity).doc) Discussion on RAT dependent integrity InterDigital, Inc. discussion Rel-18

### 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.

Including report of [Post122][401][POS] SRS configuration and activation in LPHAP (CATT)

Email discussion summary

[R2-2308812](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2308812%20Report%20of%20%5bPost122%5d%5b401%5d%5bPOS%5d%20SRS%20configuration%20and%20activation%20in%20LPHAP.docx) Report of [Post122][401][POS] SRS configuration and activation in LPHAP (CATT) CATT discussion Rel-18 NR\_pos\_enh2

Easy agreed:

SRS configuration request

Proposal 1: 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 (18/18). RAN2 to confirm a new resume cause is introduced for the use case.

Discussion:

Xiaomi suggest removing “during SRS transmission”. Huawei think the intention is to cover the case during a positioning session, and they think the wording is in line with this. Qualcomm have the same understanding.

Ericsson are fine with the proposal, but they think resume cause spare values are a bit limited, and we should inform the main session that we are consuming one.

SRS activation/deactivation

Proposal 2-1: Periodic SRS is supported to be configured with validity area (18/18). And activation/deactivation is not required for periodic SRS (14/18).

Discussion:

Qualcomm want to confirm that this refers to “legacy” SRS/SRSp, not preconfigured SRS. CATT confirm this is the intention.

ZTE think the second part should refer to explicit activation/deactivation signalling.

Qualcomm do not think we need the second part, since it is related to the legacy case.

Proposal 2-3: Aperiodic SRS is not supported to be configured with validity area (18/18). Send an LS to RAN1 to confirm this conclusion.

Discussion:

CATT indicate all companies supported the proposal, and they think an LS to RAN1 is needed.

Qualcomm think the proposal is clear, because aperiodic SRS is one-shot anyway. Huawei have the same view; even in RRC\_INACTIVE it is not possible to send a UE-specific DCI to trigger a one-shot SRS.

Preconfigured SRSs

Proposal 5: RAN2 no further consider providing pre-configured SRS via system information in Rel-18 (10/18).

Proposal 6: For the activation indication and/or request for preconfigured SRSs, RRCResumeRequest message is used (16/18). And 1 bit indication in the RRCResumeRequest is introduced for this use (12/16).

Proposal 7: The resume cause introduced for the SRS configuration request can be reused for the activation indication of the pre-configuration SRS (10/18).

Discussion:

Qualcomm think the indication is not a single bit but needs to indicate which of the preconfigured SRS should be activated. They wonder if the UE could send an additional UL MAC CE along with the RRCResumeRequest, but it may not be easy to do.

Huawei think it is related to the question of multiple validity-area configurations for a single cell, which we have not agreed on. They do not see much motivation to have multiple configurations.

Huawei wonder if the 1-bit indication is an additional bit or a new codepoint in the resumeCause; if the latter, they think it could be the same as the SRS configuration request for a unified design.

vivo agree with Huawei and think there is a relation to P8. Ericsson also agree and think we should keep the design simple. Samsung agree as well, and they think even if we have multiple configurations, the network could decide which one is activated.

CATT point out the resume cause is in P7.

Xiaomi think the preconfigured SRS is decoupled from the SRS with validity area, so multiple SRS configurations would be per cell and we would need more than one bit to indicate which one. Qualcomm have the same understanding and think a validity area may be just one cell. They think a UE might have multiple location requests requiring different SRS configurations, and the gNB cannot know which is needed.

Intel think Huawei raised a good point about whether there would be multiple configurations per cell; they also do not see a motivation for this.

Proposal 9: Sending the activation indication and/or requesting for preconfigured SRS using Msg1 is not supported (15/18).

Agreements:

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 (18/18).

WA: A new resume cause is introduced for the above use case.

Periodic SRS is supported to be configured with validity area. This agreement does not affect preconfigured SRS.

Activation/deactivation is not required for periodic SRS. This agreement does not affect preconfigured SRS.

Aperiodic SRS is not supported to be configured with validity area.

RAN2 do not further consider providing pre-configured SRS via system information in Rel-18.

For the activation indication and/or request for preconfigured SRSs, RRCResumeRequest message is used, and 1-bit indication in the RRCResumeRequest is introduced for this use.

WA: The resume cause introduced for the SRS configuration request can be reused for the activation indication of the pre-configuration SRS.

Sending the activation indication and/or requesting for preconfigured SRS using Msg1 is not supported.

Further discussed:

Configured UE-specific SRS

Proposal 2-2: RAN2 to further discuss whether semi-persistent SRS is supported to be configured with validity area (11/18), with considering the power consumption and whether legacy activation/deactivation mechanism can be reused for semi-persistent SRS.

Proposal 3: If semi-persistent SRS is supported to be configured with validity area, RAN2 agree to reuse legacy mechanism to deactivate the SP SRS (12/15).

Discussion:

Huawei think we can assume periodic as a baseline, and SP activation/deactivation can be controlled by the TAT. In this context they think SP with a validity area is not that useful, and it is difficult to send activation/deactivation in RRC\_INACTIVE.

Qualcomm think this is the legacy SRS with validity area, and it is useful for UL+DL without additional spec impact.

ZTE support P3 because the LMF does not know which cell the UE is in, so the MAC CE can be distributed to other gNBs and the UE can be paged.

Ericsson think we need to check whether UL+DL is supported for LPHAP; they think there could be a power consumption issue, and it looks complex to send the MAC CE when the UE is inactive.

Lenovo think there is no reason to restrict SP-SRS here and we can reuse the Rel-17 activation/deactivation mechanism. Samsung also support the proposal.

Ericsson understand Lenovo’s comment to mean they would like to use the SDT mechanism. Lenovo confirm this is the intention.

Qualcomm think there is no difference compared to Rel-17 with SRS in RRC\_INACTIVE, and they understand that UL+DL is in the objective. Intel agree with Qualcomm.

Proposal 4: RAN2 postpone the discussion if there is an issue of blind monitoring by the network when UE sends periodic SRS.

Agreement:

Semi-persistent SRS is supported to be configured with validity area, and RAN2 agree to reuse legacy mechanism to deactivate the SP SRS

Preconfigured SRSs

Proposal 8: RAN2 to clarify the concept of preconfigured SRS, including

- For the concept of pre-configured SRS, what SRS type can be supported? e.g., periodic SRS and SP SRS.

- Whether there should be only one SRS configuration for one validity area?

- Whether there is a need to support multiple validity areas for the same cell?

Agenda item summary (excluding items related to the email discussion)

[R2-2308959](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2308959.docx) Summary for 7.2.4 LPHAP excluding SRS configuration & activation part OPPO discussion Rel-18 NR\_pos\_enh2

The following proposals are to be agreed (potentially long-time discussion is needed for proposal 2):

Proposal 1: RAN2 to agree that alignment of PRS to fixed (e)DRX should be adopted to ensure the alignment between PRS and (e)DRX.

Proposal 2: RAN2 to agree that both of UE-initialized and LMF-initialized on-demand PRS request procedure are adopted for the alignment from the PRS configuration to the (e)DRX configuration.

Discussion:

Qualcomm think LMF-initiated is confusing here.

Apple note that there are proposals to expose the (e)DRX information to the LMF.

Proposal 6: RAN2 to agree that the PRS periodicity is extended to be larger than 10240ms to suit the eDRX cycle value for eDRX paging cycle in RRC\_INACTIVE and/or RRC\_IDLE. LS to RAN1 for confirmation of the feasibility.

Discussion:

Qualcomm do not think this makes sense since the PRS configuration comes from RAN1, and functionally they see that the PRS configuration needs to serve multiple UEs and may need to be more frequent.

CATT also think the proposal does not make sense from RAN2.

Samsung also do not support it because the UE can still measure on the paging occasions in the PTW.

vivo think the proposal is not needed because it focusses on power saving on the network side.

Proposal 8: RAN2 to agree to support UE to utilize the positioning assistance data through posSIB or pre-configured assistance data in RRC\_CONNECTED when UE is to perform positioning in RRC\_IDLE.

Discussion:

Ericsson think we could capture something in stage 2. ZTE and Lenovo agree.

vivo think “pre-configured” is not needed because it is about preconfiguration in Rel-17.

Proposal 12: RAN2 to agree that the following criteria needs to be defined for the start/re-start of the area-specific TA timer:

 Reception of RRCRlease message containing the SRS configuration

Proposal 13: RAN2 to agree that following criteria needs to be defined for the stop of the area-specific TA timer (FFS other conditions):

 Reception of RRCResume message

 Reception of RRCSetup message

Discussion:

Huawei think this might not be useful for preconfigured SRS, where we do not need to start the timer immediately, but it is OK for the non-preconfigured case.

OPPO wonder what would then control the release of preconfigured SRS. Huawei indicate that if the UE autonomously releases the SRS configuration, the network does not know, but it can be released by explicit signalling.

Agreements:

At least alignment of PRS to fixed (e)DRX is supported.

At least UE-initiated on-demand PRS request procedure is supported for the alignment of the PRS configuration to the fixed (e)DRX configuration.

UE may utilize the positioning assistance data through posSIB or assistance data received in RRC\_CONNECTED when UE is to perform positioning in RRC\_IDLE. No stage 3 impact is foreseen.

The following criterion needs to be defined for the start/re-start of the area-specific TA timer:

 Reception of RRCRelease message containing the SRS configuration (excluding pre-configured SRS)

The following criteria need to be defined for the stop of the area-specific TA timer (FFS other conditions):

 Reception of RRCResume message

 Reception of RRCSetup message

 Reception of RRCRelease message without SRS configuration

The following proposal is to be discussed:

Proposal 3: RAN2 to discuss whether following IEs are needed to be included or enhanced in the UE-initiated on-demand request message:

 to include the demanded PRS time offset associated with each requested PRS periodicity, to align with PO location>

 to include the demanded PRS time duration associated with each requested PRS periodicity, to align with PO location.

 to include more than one of the demanded PRS periodicities per PFL, to align with PO locations within and outside the PTW, respectively.

 to include requested DL-PRS activation periodicity/start offset/duration, to align with periodic PTW location.

 to include UE-related (e)DRX information and LPHAP indication

Proposal 4: RAN2 to discuss whether a LS needs to be sent to RAN3 to trigger them for discussion of how to align the PRS with the DRX of serving cell and/or neighbour cell.

Proposal 5: RAN2 to discuss whether it is needed to align the LPHAP UEs waking up time and if the answer is yes, FFS how.

Proposal 7: RAN2 to discuss that whether or not the UE shall only enter the sleep phase after the UE has received some form of feedback that the NW has obtained the UE position with the required accuracy. FFS: How the feedback is informed, via LPP or MAC-CE.

Proposal 9: RAN2 to discuss whether or not triggered event(s) should be defined for the positioning in the RRC\_IDLE state for the UE to transit to RRC\_Connected state for the measurement reporting. FFS what kind of triggered event should be introduced.

Proposal 10: RAN2 to discuss whether to introduce following two UE capabilities in the LPP and RRC spec, after more conclusions are made for SRS with validity area and SRS pre-configuration:

 supporting SRS with validity area in RRC\_INACTIVE

 supporting SRS pre-configuration in RRC\_INACTIVE

Proposal 11: RAN2 to discuss which option(s) to be adopted as the criteria to release the pre-configured SRS configuration:

 Network-initiated message:

 New TA timer to be introduced controlling how long the SRS resource is reserved for the UE within the validity area

 Area-specific TA timer expiration

 Reselection to other cell out of the SRS validity area

The following documents will not be individually treated

[R2-2307121](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2307121%20Discussion%20on%20LPHAP_final.docx) Discussion on LPHAP Huawei, HiSilicon discussion Rel-18 NR\_pos\_enh2

[R2-2307186](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2307186_LPHAP_Fraunhofer.docx) Enhancements for supporting LPHAP Fraunhofer IIS, Fraunhofer HHI discussion

[R2-2307394](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2307394%20Discussion%20on%20SRS%20configuration%20with%20validity%20area%20and%20alignment%20between%20PRS%20and%20(e)DRX.docx) Discussion on SRS configuration with validity area and alignment between PRS and (e)DRX CATT discussion Rel-18 NR\_pos\_enh2

[R2-2307428](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2307428_Discussion%20on%20solution%20of%20LPHAP.doc) Discussion on solution of LPHAP vivo discussion Rel-18 FS\_NR\_pos\_enh2

[R2-2307665](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2307665%20LPHAP.docx) Further considerations on LPHAP Intel Corporation discussion Rel-18 NR\_pos\_enh2

[R2-2307824](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2307824-PRS-DRX-alignment-v1.docx) Alignment between DRX and PRS Apple discussion NR\_pos\_enh2

[R2-2308000](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2308000%20Discussion%20on%20low%20power%20high%20accuracy%20positioning.doc) Discussion on low power high accuracy positioning Lenovo discussion Rel-18

[R2-2308051](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2308051%20Discussion%20on%20LPHAP%20enhancement.docx) Discussion on LPHAP enhancement OPPO discussion Rel-18 NR\_pos\_enh2

[R2-2308126](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2308126%20Discussion%20on%20LPHAP.docx) Discussion on LPHAP Spreadtrum Communications discussion Rel-18

[R2-2308135](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2308135%20Discussion%20on%20LPHAP.docx) Discussion on LPHAP ZTE Corporation discussion Rel-18 NR\_pos\_enh2

[R2-2308153](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2308153LPHAP.docx) Considerations on Low Power High Accuracy Positioning Sony discussion Rel-18 FS\_NR\_pos\_enh2

[R2-2308261](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2308261%20Discussion%20on%20LPHA%20positioning.doc) Discussion on LPHA positioning Xiaomi discussion

[R2-2308317](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2308317%20Further%20considerations on LPHAP.doc) Further considerations on LPHAP CMCC discussion Rel-18 NR\_pos\_enh2

[R2-2308398](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2308398_(LPHAP).docx) Enhancements for LPHAP Qualcomm Incorporated discussion

[R2-2308481](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2308481%20LPHAP.docx) Discussion on Low Power High Accuracy Positioning Ericsson discussion Rel-18

[R2-2308618](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2308618%20(R18%20NR%20POS%20A724%20LPHAP).doc) Discussion on LPHAP InterDigital, Inc. discussion Rel-18

[R2-2308693](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2308693_Discussion%20on%20alignment%20between%20(e)DRX%20and%20PRS.docx) Discussion on alignment between (e)DRX and PRS Samsung discussion Rel-18 NR\_pos\_enh2

[R2-2308694](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2308694_Discussion%20on%20SRS%20configuration%20in%20RRC_INACTIVE.docx) Discussion on SRS configuration in RRC\_INACTIVE Samsung 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.

[R2-2308001](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2308001%20Discussion%20on%20RedCap,%20carrier%20phase%20positioning%20and%20PRS,SRS%20bandwidth%20aggregation.doc) Discussion on RedCap positioning, carrier phase positioning and PRS/SRS bandwidth aggregation Lenovo discussion Rel-18

Redcap Positioning:

Proposal 1: LMF may request gNB to provide PRS FH configuration and then indicates the determined PRS FH configuration to UE by LPP ProvideAssistanceData message.

Proposal 2: LMF may request serving gNB to provide the SRS FH configuration with SRS configuration to UE and feedback the SRS FH configuration to LMF.

Proposal 3: UE performs hop switch or BWP switch autonomously according to the configuration from network.

Carrier phase positioning:

Proposal 4: UE indicates the support of carrier phase positioning in LPP ProvideCapabilities message, and further includes the support of RSCP or RSCPD measurement.

Proposal 5: The legacy LPP RequestLocationInformation and ProvideLocationInformation message for time-based positioning are enhanced to carry the CPP measurement configuration and CPP measurement reporting.

Proposal 6: For double differential CPP measurement, LMF indicates the time period of SRS transmission to the serving gNB of UE including target UE and PRU by enhancing current requested UL-SRS transmission characteristics information for UL positioning.

Proposal 7: For double differential CPP measurement, LMF indicates the time period for PRS measurement to target UE and PRU by LPP provide assistance data message.

PRS/SRS bandwidth aggregation:

Proposal 8: For DL PRS bandwidth aggregation across PFLs, RAN2 to consider following signalling enhancements:

− Include the joint measurement indication and the aggregated PRSs resource PRS sets IDs across PFLs in LPP RequestLocationInformation message.

− Include the PFL aggregation indication and the aggregated measurement results with PRS resource sets ID in LPP ProvideLocationInformation message.

Discussion:

ZTE think an additional message should be added: the Provide Assistance Data to indicate the PFL link per TRP.

Qualcomm think this should come from the RAN1 parameter list and be implemented in the LPP CR. Ericsson think we should align to RAN1 terminology.

Proposal 9: For UL SRS bandwidth aggregation across two or three carriers, the signalling enhancement between gNB and LMF to support the bandwidth aggregation indication should be confirmed with RAN3.

Discussion:

ZTE think P9 is obvious and does not need to be agreed; they understand RAN3 are already designing the signalling.

On the related topic of MAC CE for activation/deactivation, ZTE think we need to discuss whether a new or legacy MAC CE is used. Huawei do not see the need for a new one.

Ericsson would also like to avoid a new MAC CE, because the LCID is expensive. They think the legacy should be able to handle it.

Qualcomm think the question in the LS is not related to whether it is legacy or new, only to whether one MAC CE can do the job.

vivo think there is only one bit available in the legacy MAC CE, and it will not carry enough information. Huawei and Qualcomm think it can still be used.

Agreements:

For DL PRS bandwidth aggregation across PFLs, RAN2 to consider following signalling enhancements (subject to the details of the RAN1 parameter list):

− Include the joint measurement indication and the aggregated PRSs resource PRS sets IDs across PFLs in LPP RequestLocationInformation and ProvideAssistanceData messages.

− Include the PFL aggregation indication and the aggregated measurement results with PRS resource sets ID in LPP ProvideLocationInformation message.

For activation/deactivation of aggregated SRS across two or three carriers, a single MAC CE is used. FFS if it can be a legacy MAC CE or a new one is needed.

P2/P3/P4 provided for reference in discussion of the previous document (cf. P6/P7 above)

[R2-2307395](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2307395%20Discussion%20on%20carrier%20phase%20positioning,%20bandwidth%20aggregation%20for%20positioning%20and%20Redcap%20positioning.docx) Discussion on carrier phase positioning, bandwidth aggregation for positioning and Redcap positioning CATT discussion Rel-18 NR\_pos\_enh2

Proposal 2: To enable simultaneous transmission of UL SRS and measurement of target UE and a PRU which are agreed in RAN1, there are impacts on RRC and NRPPa, including:

-RRC: gNB configure the transmission of the UL SRS resources within indicated time window(s);

-NRPPa: LMF request serving gNB of a UE to configure the transmission time window(s). LMF request the serving gNB and neighboring gNBs of the UE to measure the UL SRS resources from the UE within indicated time window(s).

Proposal 3: To enable simultaneous measurements on same DL PRS by a target UE and a PRU which are agreed in RAN1, there are impacts on LPP: LMF request the UEs to perform measurements within indicated time window(s).

Proposal 4: RAN2 to provide assistance data which is DL carrier phase measurement reported by a PRU to a target UE for UE-based carrier phase positioning which is agreed in RAN1.

[R2-2307429](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2307429%20RAN2-related%20issues%20about%20bandwidth%20aggregation.docx) RAN2-related issues about bandwidth aggregation vivo discussion Rel-18 FS\_NR\_pos\_enh2

[R2-2307455](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2307455%20Discussion%20on%20RAN1%20led%20positioning%20topics.docx) Discussion on RAN1 led positioning topics Huawei, HiSilicon discussion

[R2-2307666](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2307666%20RAN1%20led%20items.docx) Considerations on other RAN1 led items Intel Corporation discussion Rel-18 NR\_pos\_enh2

[R2-2307827](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2307827-on-demand-prs-aggregation-v0.docx) On-demand PRS with bandwidth aggregation Apple discussion NR\_pos\_enh2

[R2-2308137](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2308137%20Discussion%20on%20BW%20aggregation%20and%20RedCap%20positioning.docx) Discussion on BW aggregation and RedCap positioning ZTE Corporation discussion Rel-18 NR\_pos\_enh2

[R2-2308174](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2308174%20RedCap%20Positioning.docx) Discussion on Frequency hopping for Positioning for RedCap Ues Sony discussion Rel-18 FS\_NR\_pos\_enh2

[R2-2308262](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2308262%20Discussion%20on%20RedCap%20positioning,%20carrier%20phase%20positioning%20and%20bandwidth%20aggregation%20for%20positioning.doc) Discussion on RedCap positioning, carrier phase positioning and bandwidth aggregation for positioning Xiaomi discussion

[R2-2308399](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2308399_(PRS%20Aggregation).docx) Configuration Enhancements for DL-PRS Aggregation Qualcomm Incorporated discussion

[R2-2308483](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2308483%20RedCap.docx) Discussion based upon RAN1 agreements on CPP, RedCap, Bandwidth aggregation Ericsson discussion Rel-18

[R2-2308619](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2308619%20(R18%20NR%20POS%20A725%20Others).doc) Discussion on positioning for RedCap positioning, carrier phase positioning, and bandwidth aggregation for positioning InterDigital, Inc. discussion Rel-18

[R2-2308761](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2308761%20Carrier%20Phase%20Positioning.docx) Assessment of impact of carrier phase positioning on higher layer protocols Nokia, Nokia Shanghai Bell discussion Rel-18 NR\_pos\_enh2-Core]

## 7.9 Enhanced NR Sidelink Relay

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

Time budget: 1.5 TU

Tdoc Limitation: 4 tdocs

### 7.9.1 Organizational

Including incoming LSs and rapporteur inputs.

Incoming LSs with “take into account” action

[R2-2307057](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2307057_S2-2307707.docx) Reply LS to SA2 on authorization for multi-path Scenario 2 (S2-2307707; contact: LGE) SA2 LS in Rel-18 NR\_SL\_relay\_enh, 5G\_ProSe\_Ph2 To:RAN2 Cc:RAN3

* Noted

Discussion:

vivo wonder how we should proceed.

Qualcomm think we could wait for further information from SA2.

LG understand that this is the SA2 conclusion and there is not much for us to do.

vivo are concerned about cases where the gNB would release the relay because of not knowing that it is doing relaying.

OPPO agree with LG and think the LS is quite clear.

Samsung understand that we do not need to add anything for authorization.

Ericsson think SA2 made it clear that there is no authorization information from them, and it is up to us if we want to have some solution; they think it could be contribution-driven.

Qualcomm think we can rely on the scenario 1 mechanism, but if we have no authorization, any UE could request multi-path.

LG interpret from the LS that any authorization mechanism should not have CN impact. Apple have the same understanding.

vivo think companies may be over-reading the LS; they understand that it was not extensively discussed in SA2 and we can consider RAN2 proposals.

[R2-2307072](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2307072_S3-233323.docx) Reply LS on security for L2 UE-to-UE relay (S3-233323; contact: Lenovo) SA3 LS in Rel-18 NR\_SL\_relay\_enh, FS\_5G\_ProSe\_Ph2 To:RAN2

* Noted

Other incoming LS

[R2-2307055](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2307055_S2-2305915.doc) Reply LS on 5G ProSe Layer-2 UE-to-UE Relay QoS enforcement (S2-2305915; contact: Qualcomm) SA2 LS in Rel-18 5G\_ProSe\_Ph2 To:RAN2

* Noted

Running CRs and related documents

[R2-2307235](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\38351_CRyyyy_(REL-18)_R2-2307235_Running%20CR%20of%20TS%2038.351%20for%20SL%20Relay%20enhancement.docx) Running CR of TS 38.351 for SL Relay enhancement OPPO draftCR Rel-18 38.351 17.5.0 B NR\_SL\_relay\_enh-Core

* [AT123][411][Relay] Rel-18 SRAP CR (OPPO)

Scope: Collect comments on the CR in R2-2307235 and produce an endorsable version.

Intended outcome: Endorsable CR in R2-2309184

Deadline: Thursday 2023-08-24 2000 UTC

R2-2309184 Running CR of TS 38.351 for SL Relay enhancement OPPO draftCR Rel-18 38.351 17.5.0 B NR\_SL\_relay\_enh-Core

[R2-2307546](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2307546_Introduction%20of%20NR%20sidelink%20U2U%20relay.docx) Introduction of NR sidelink U2U relay vivo draftCR Rel-18 38.331 17.5.0 B NR\_SL\_relay\_enh-Core

* [AT123][412][Relay] Rel-18 RRC CR on U2U relay (vivo)

Scope: Collect comments on the CR in R2-2307546 and produce an endorsable version.

Intended outcome: Endorsable CR in R2-2309185

Deadline: Thursday 2023-08-24 2000 UTC

R2-2309185 Introduction of NR sidelink U2U relay vivo draftCR Rel-18 38.331 17.5.0 B NR\_SL\_relay\_enh-Core

[R2-2307720](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2307720.docx) 38.322 running CR for enhanced NR sidelink relay Xiaomi draftCR Rel-18 38.322 17.3.0 B NR\_SL\_relay\_enh-Core

* [AT123][413][Relay] Rel-18 relay RLC CR (Xiaomi)

Scope: Collect comments on the CR in R2-2307720 and produce an endorsable version.

Intended outcome: Endorsable CR in R2-2309186

Deadline: Thursday 2023-08-24 2000 UTC

R2-2309186 38.322 running CR for enhanced NR sidelink relay Xiaomi draftCR Rel-18 38.322 17.3.0 B NR\_SL\_relay\_enh-Core

[R2-2307854](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2307854%20Draft%20running%20CR%2038.321.docx) Draft Running CR 38.321 Apple draftCR Rel-18 38.321 17.5.0 B NR\_SL\_relay\_enh-Core

* [AT123][414][Relay] Rel-18 relay MAC CR (Apple)

Scope: Collect comments on the CR in R2-2307854 and produce an endorsable version.

Intended outcome: Endorsable CR in R2-2309187

Deadline: Thursday 2023-08-24 2000 UTC

R2-2309187 Draft Running CR 38.321 Apple draftCR Rel-18 38.321 17.5.0 B NR\_SL\_relay\_enh-Core

[R2-2307920](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2307920_38.300_DraftCR.docx) Draft running CR 38.300 LG Electronics Inc. draftCR Rel-18 38.300 17.5.0 B NR\_SL\_relay\_enh-Core

* [AT123][415][Relay] Rel-18 relay stage 2 CR (LG)

Scope: Collect comments on the CR in R2-2307920 and produce an endorsable version.

Intended outcome: Endorsable CR in R2-2309188

Deadline: Thursday 2023-08-24 2000 UTC

R2-2309188 Draft running CR 38.300 LG Electronics Inc. draftCR Rel-18 38.300 17.5.0 B NR\_SL\_relay\_enh-Core

[R2-2308203](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2308203%20RRC%20running%20CR%20for%20Rel-18%20multi-path%20support.docx) RRC running CR for Rel-18 multi-path support Huawei, HiSilicon draftCR Rel-18 38.331 17.5.0 B NR\_SL\_relay\_enh-Core

[R2-2308204](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2308204%20Considerations%20on%20Multi-path%20RRC%20running%20CR.docx) Considerations on Multi-path RRC running CR Huawei, HiSilicon discussion Rel-18 NR\_SL\_relay\_enh-Core

* [AT123][416][Relay] Rel-18 RRC CR on multi-path relay (Huawei)

Scope: Collect comments on the CR in R2-2308203 and produce an endorsable version.

Intended outcome: Endorsable CR in R2-2309189

Deadline: Thursday 2023-08-24 2000 UTC

R2-2309189 RRC running CR for Rel-18 multi-path support Huawei, HiSilicon draftCR Rel-18 38.331 17.5.0 B NR\_SL\_relay\_enh-Core

[R2-2308559](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2308559%20-%2038.304_draftCR(Rel-18)_Introduction%20of%20Rel-18%20support%20for%20SL%20Relay%20Enhancements.docx) Introduction of Rel-18 support for SL Relay Enhancements Ericsson España S.A. draftCR Rel-18 38.304 17.5.0 B NR\_SL\_relay\_enh

* [AT123][417][Relay] Rel-18 relay idle mode CR (Ericsson)

Scope: Collect comments on the CR in R2-2308559 and produce an endorsable version.

Intended outcome: Endorsable CR in R2-2309225

Deadline: Thursday 2023-08-24 2000 UTC

R2-2309225 Introduction of Rel-18 support for SL Relay Enhancements Ericsson España S.A. draftCR Rel-18 38.304 17.5.0 B NR\_SL\_relay\_enh

[R2-2308687](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2308687_38331_CR%234277_Rel-18_SL_relay_service_continuity.docx) Introduction of Rel-18 SL relay service continuity MediaTek, Inc CR Rel-18 38.331 17.5.0 4277 - B NR\_SL\_relay\_enh-Core

* [AT123][418][Relay] Rel-18 RRC CR on relay service continuity (MediaTek)

Scope: Collect comments on the CR in R2-2308687 and produce an endorsable version.

Intended outcome: Endorsable CR in R2-2309226

Deadline: Thursday 2023-08-24 2000 UTC

R2-2309226 Introduction of Rel-18 SL relay service continuity MediaTek, Inc CR Rel-18 38.331 17.5.0 4277 - B NR\_SL\_relay\_enh-Core

### 7.9.2 UE-to-UE relay

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

Agenda item summary

R2-2308956 Summary of UE-to-UE relay Qualcomm Incorporated discussion NR\_SL\_relay\_enh-Core

* [AT123][401][Relay] Summary proposals on UE-to-UE relay (Qualcomm)

Scope: Discuss the proposals in R2-2308956 and progress towards agreements.

Intended outcome: Report to Wednesday online session in R2-2309101

Deadline: Tuesday 2023-08-22 2000 UTC

[R2-2309101](C:\\Users\\mtk16923\\Documents\\3GPP Meetings\\202308 - RAN2_123, Toulouse\\Extracts\\R2-2309101_Summary proposals on UE-to-UE relay_final.docx" \o "C:\Users\mtk16923\Documents\3GPP Meetings\202308 - RAN2_123, Toulouse\Extracts\R2-2309101_Summary proposals on UE-to-UE relay_final.docx) Summary proposals on UE-to-UE relay Qualcomm Incorporated discussion NR\_SL\_relay\_enh-Core

Discovery and Relay (re)selection

[Easy]Proposal 2a: UE in RRC\_CONNECTED state UE can obtain dedicated discovery configuration.

[Easy]Proposal 5: For integrated discovery DCA message, no AS criterion is needed for the relay UE to forward the response message to the source Remote UE.

Discussion:

Ericsson wonder about the spec impact of P2.

[Majority (12/14)] Proposal 3: For Model B, the relay UE forwards the solicitation message only if the PC5 RSRP between the relay UE and the source remote UE is above a threshold.

[Majority (11/14)] Proposal 4: For Model B, no AS criterion is needed for the relay UE to forward the response message to the source Remote UE.

Discussion:

LG think in P4, the cast type of the response message can be broadcast or unicast, and the relay may behave differently, e.g., filtering of broadcast messages at the relay UE.

vivo wonder why we need to handle the two messages differently. They assume relay selection has been performed at the target remote for this to make sense, but in their understanding it should be done at the source.

Qualcomm indicate that for the response message, we already agreed that the target remote UE will select the candidate relay UE, and we shouldn’t need the relay UE to figure it out again.

OPPO think we have discussed the cast type for discovery previously and checked with SA2, and the indication was that there would be no cast type indication from ProSe layer to AS layer, but they understand the L2ID would be used for a single UE, not broadcast. They understand the hop quality can be evaluated by the source remote UE.

Xiaomi have the same understanding as Qualcomm and think the forwarding in P3 aligns with model A. On P4, they also consider that the assessment should be done by the target UE and nothing more is needed.

Apple think the only concern is LG’s point about the cast type, and in their view any filtering can be done by upper layers.

InterDigital agree with Apple.

vivo are OK with the proposal after the discussion.

LG understand that the relay UE do not need to filter if the target UE checks the link.

E2E SL-SRB configuration,

[Easy]Proposal 7: E2E SL-SRB and E2E SL-DRB use different index(es).

[Easy]Proposal 8: Fixed index (i.e., 0/1/2/3) are defined for E2E SL-SRB 0/1/2/3 respectively.

[Easy]Proposal 9: Use specified PC5 RLC Channel configuration on each hop for E2E SL-SRB 0/1/2/3.

E2E SL-DRB configuration,

[Easy]Proposal 11: The TX Remote UE derives the PDCP and SDAP configuration for SL-DRB and provides configuration related RX to the RX Remote UE using E2E PC5-RRC message.

[Easy]Proposal 12: The TX Remote UE derives the first hop configuration (e.g. RLC Channel configuration) for SL-DRB and provides configuration related to RX to the relay UE using per-hop PC5-RRC message.

Discussion:

OPPO wonder if parameters “related to Rx” should be determined by the Rx UE instead. Xiaomi have the same concern.

vivo wonder if the wording still applies for mode 1, where the parameters may come from the gNB. Samsung think mode 1 is not related to the configuration but only scheduling.

InterDigital think P11 is similar to legacy behaviour; there are parameters sent by the Tx UE and others that the Rx UE determines on its own.

NEC want to clarify in P12 if Rx refers to Rx by the relay UE or the remote UE; if it is the relay UE, this could be more explicit.

Apple think P12 can be clearer about the PC5 relay RLC channel.

ZTE think the configuration may be established by the gNB or preconfiguration instead of derived from scratch by the Tx remote UE. Qualcomm indicate there were different views, but the point here is to propose that the remote UE rather than the relay UE initiates the configuration.

Ericsson wonder if we are restricting the relay UE from determining the QoS split. OPPO think the relay UE will send the split QoS information to both remote UEs, so the source remote UE can determine the configuration while taking it into account. InterDigital see Ericsson’s concern but think the second hop configuration can still be determined in line with the QoS.

vivo share the view with OPPO and think P18 relates to this issue.

[Easy]Proposal 13a: The Relay UE derives the second hop configuration (e.g. RLC Channel configuration) for each SL-DRB.

[Easy]Proposal 13b: It is FFS how the Relay UE derives second hop configuration for SL-DRB, e.g. according to e.g. the QoS profiles for the second hop and preconfiguration or configuration from gNB.

QoS handling,

[Easy]Proposal 15: Same as L3 based U2U relay, the QoS split should be per QoS flow, and the source UE should inform the Relay UE QoS flow(s) and corresponding QoS profiles.

Discussion:

ZTE think it should be sent from the source UE to the relay UE, but SA2 already defined a message carrying the QoS profile and we may not need to duplicate the functionality. Samsung are not sure if SA2 support the split in PC5-S signalling; they understand the message applies to Tx and Rx UEs, but may not consider the role of the relay UE.

Qualcomm think SA2 were clear about L3, at least, and the proposal is to have a similar design for L2.

[Easy]Proposal 16: At least PDB is sent from the source UE to the relay UE for splitting.

[Easy] Proposal 17: If it is Relay UE to derive the second hop configuration for the E2E SL-DRB, then the source UE sends to the Relay UE all the QoS profiles.

[Easy]Proposal 18: split PDB is sent to the source (TX) Remote UE from the Relay UE.

[Easy]Proposal 19: It is left to Relay UE implementation on how to split the QoS profiles.

Discussion:

InterDigital wonder if P19 refers only to the PDB. Qualcomm intended the wording to be general and include, e.g., remapping of other QoS parameters to the two hops. vivo and Ericsson understand that only the PDB needs to be split.

UE ID in SRAP,

[Majority, 10/13] Proposal 21: At least for single-hop relay, use local ID instead of L2 ID as UE ID in SRAP header.

[Majority, 10/14] Proposal 22: At least for single-hop U2U relay, two local IDs are included in SRAP header to identify source and target Remote UE respectively.

[Easy] Proposal 23: At least for single-hop U2U relay, global local ID is used as UE ID in SRAP header.

Discussion:

Qualcomm clarify the “global local ID” means the same local ID for all hops.

NEC think “global local ID” is not ideal terminology.

Apple think we should focus on P21/P22, and P23 may not be reasonable. They understand that even a “per-hop” ID is actually “per-relay”.

vivo have the same understanding as NEC; we should just say if the local ID is the same or different on each hop.

Samsung understand that the point is to have a new SRAP “local” ID, i.e., not the L2ID.

Nokia agree with Apple, and they think if we define a “global” local ID we need to define what it means.

LG wonder about the implications for the SRAP header format (which has only one ID field today).

Agreements:

UE in RRC\_CONNECTED state can obtain UE-to-UE relay discovery parameters in dedicated discovery configuration.

For integrated discovery DCA message, no AS criterion is needed for the relay UE to forward the response message to the source Remote UE.

For Model B, the relay UE forwards the solicitation message only if the PC5 RSRP between the relay UE and the source remote UE is above a threshold.

For Model B, no AS criterion is needed for the relay UE to forward the response message to the source Remote UE.

E2E SL-SRB and E2E SL-DRB use different index(es).

Fixed index (i.e., 0/1/2/3) are defined for E2E SL-SRB 0/1/2/3 respectively.

Use specified PC5 RLC Channel configuration on each hop for E2E SL-SRB 0/1/2/3.

The TX Remote UE derives the PDCP and SDAP configuration for e2e SL-DRB and provides the portion of the configuration related to RX to the RX Remote UE using E2E PC5-RRC message (similar to legacy PC5 configuration).

The TX Remote UE derives the first hop configuration (e.g. PC5 relay RLC Channel configuration) for SL-DRB and provides to the relay UE the portion of the configuration related to RX on the first hop (i.e., Rx by the relay UE), using per-hop PC5-RRC message (similar to legacy PC5 configuration).

The two conclusions above do not exclude the derivation involving information from gNB/preconfiguration/specified configuration.

Split PDB is sent to the source (TX) Remote UE from the Relay UE.

It is left to Relay UE implementation on how to split the PDB.

The Relay UE derives the second hop configuration (e.g. PC5 relay RLC Channel configuration) for each SL-DRB.

It is FFS how the Relay UE derives second hop configuration for SL-DRB.

Same as L3 based U2U relay, the QoS split should be per e2e QoS flow, and RAN2 expect that the source UE will inform the Relay UE QoS flow(s) and corresponding QoS profiles. FFS if this requires AS signalling or can be done in upper layers.

At least PDB is sent from the source UE to the relay UE for splitting.

The source UE sends to the Relay UE all the QoS profiles for the e2e QoS flows.

At least for single-hop relay, use local ID instead of L2 ID as UE ID in SRAP header.

At least for single-hop U2U relay, two local IDs are included in SRAP header to identify source and target Remote UE respectively. FFS impact on SRAP header.

For single-hop U2U relay, the local ID for a particular UE is the same on both hops.

* [AT123][433][Relay] LS to SA2 on U2U agreements (InterDigital)

Scope: Notify SA2 of the agreements on U2U relay from RAN2#123. Expected action is “take into account”.

Intended outcome: Approved LS (without CB if possible) in R2-2309178

Deadline: Thursday 2023-08-24 2000 UTC

To discuss proposals,

[ToDis]Proposal 1: The UE can trigger Relay selection when detecting direct link PC5-RLF.

[ToDis]Proposal 2b: It is FFS on what configuration should be provided in discovery dedicated configuration, whether any enhancement is needed, and what configuration should be used if no dedicated configuration received in CONNECTED state.

[ToDis] Proposal 6: Whether AS criterion is needed for switching from indirect link to direct link

[ToDis]Proposal 10: Option 2 is used as per-hop configuration for E2E SL-SRBs.

Option 1: Reuse existing specified per-hop (e.g. RLC Channel configuration) of SL-SRB 0/1/2/3 (SCCH) as per-hop (e.g. RLC Channel configuration) of E2E SL-SRB 0/1/2/3.

Option 2: New specified per-hop configurations for E2E SL-SRB 0/1/2/3 respectively.

Option 3: One or more new per-hop configuration(s) for E2E SL-SRB 0/1/2/3, and multiple E2E SL-SRBs can share one per-hop configuration.

Discussion:

Apple think there was a lot of support for option 3, with one specified configuration shared between the SL-SRBs. vivo agree.

OPPO understand that the SL-SRBs will use different RLC channels, so something will be different.

Apple think there is MAC impact to define different LCIDs. In legacy operation we needed different LCIDs to differentiate different messages, but here we have agreed that the SRAP header can be used to differentiate.

Ericsson think in that case option 1 would work also. OPPO think in legacy, we do not have the SRAP layer, and we cannot just reuse the legacy configuration; but they are fine with option 2.

Agreement:

New specified per-hop configurations are used for E2E SL-SRB 0/1/2/3 respectively. FFS how they will be implemented in specs (e.g., if the configurations are identical the tables might be merged for different SL-SRBs).

[ToDis after P13/P15] Proposal 14: If P13 is agreed, the source Remote UE informs the QoS flow-to- SL-DRB mapping to the relay UE via PC5-RRC, relay UE can derive the second hop configuration for the SL-DRB based on the QoS flow-bearer mapping.

[ToDis] Proposal 20: RAN2 discusses to use PC5-RRC message or reuse existing PC5-S message to send QoS profiles to Relay UE, considering e.g. QoS profiles split per bearer or per QoS flow and what QoS parameters to be sent to the Relay UE.

[ToDis]Proposal 24: Discuss whether and how to support multi-hop relays in Rel-18.

R2-2309178 (LS from [433]) InterDigital LS out Rel-18 NR\_SL\_relay\_enh-Core To:SA2

The following documents will not be individually treated

[R2-2307233](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2307233%20-%20Discussion%20on%20U2U%20Relay.docx) Discussion on U2U relay OPPO discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2307386](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2307386_Discussion%20on%20remaining%20issue%20of%20U2U%20relay.docx) Discussion on remaining issue of U2U relay NEC discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2307402](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2307402%20Discussion%20on%20the%20adaptation%20layer.doc) Discussion on the adaptation layer Fujitsu discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2307446](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2307446.doc) Discussion on U2U relay Sharp discussion Rel-18 NR\_SL\_relay\_enh-Core

* Revised in R2-2308952

[R2-2308952](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2308952.doc) Discussion on U2U relay Sharp discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2307547](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2307547_Remaining%20issues%20on%20U2U%20discovery%20and%20relay%20(re)selection.docx) Remaining issues on U2U discovery and relay (re)selection vivo discussion

[R2-2307548](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2307548_%20Discussion%20on%20the%20remaining%20issues%20of%20L2%20U2U%20relaying.docx) Discussion on the remaining issues of L2 U2U relaying vivo discussion

[R2-2307551](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2307551%20Disussion%20on%20U2U%20Relay.docx) Discussion on U2U Relay CATT discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2307641](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2307641.docx) U2U Relay selection reselection, SRAP design Beijing Xiaomi Mobile Software discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2307655](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2307655_FhG_SL-Relay_ShortID.docx) Discussion on using short ID in U2U relaying Fraunhofer IIS, Fraunhofer HHI discussion Rel-18 NR\_SL\_relay\_enh

[R2-2307716](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2307716%20Discussion%20on%20U2U%20relay.docx) Discussion on U2U relay TCL discussion

[R2-2307732](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2307732%20QoS%20and%20bearer%20configuration%20for%20L2%20U2U%20relaying.doc) QoS and bearer configuration for L2 U2U relaying Samsung discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2307742](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2307742-common%20part%20and%20Layer-2%20specific%20part%20on%20U2U%20Relay.docx) Common part and Layer-2 specific part on U2U Relay Qualcomm Incorporated discussion NR\_SL\_relay\_enh-Core

[R2-2307743](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2307743-gNB%20involvement%20on%20U2U%20relay.docx) gNB involvement and capability on U2U relay Qualcomm Incorporated discussion NR\_SL\_relay\_enh-Core

[R2-2307750](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2307750_U2U_relay.docx) Considerations for U2U L2 relay operations Kyocera discussion Rel-18

[R2-2307855](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2307855%20Discussion%20on%20U2U%20relay%20issues.doc) Discussion on remaining issues on UE-to-UE Relay Apple discussion Rel-18

[R2-2307932](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2307932-Control%20plane%20procedure%20for%20U2U%20relay.docx) Control plane procedure for U2U relay LG Electronics Inc. discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2307944](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2307944+Further%20discussion%20on%20L2%20U2U%20relay.doc) Further discussion on L2 U2U relay China Telecom discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2307989](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2307989%20Discussion%20on%20L2%20U2U%20relay%20v1.0.docx) Discussion on L2 U2U relay Lenovo discussion Rel-18

[R2-2308100](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2308100_Discussion%20on%20U2U%20Relay%20discovery%20and%20(re)selection.doc) Discussion on U2U Relay discovery and (re)selection ZTE, Sanechips discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2308101](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2308101_Discussion%20on%20U2U%20relay%20L2%20specific%20functionality.doc) Discussion on U2U relay L2-specific functionality ZTE, Sanechips discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2308104](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2308104%20SRAP%20design%20for%20U2U%20sidelink%20relay_final.doc) SRAP design for U2U Sidelink Relay Samsung discussion

[R2-2308119](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2308119%20Discussion%20on%20UE-to-UE%20relay.doc) Discussion on UE-to-UE Relay Spreadtrum Communications discussion Rel-18

[R2-2308160](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2308160.doc) UE-to-UE relay (re)selection Sony discussion Rel-18 NR\_SL\_relay\_enh

[R2-2308161](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2308161.docx) Discussion on DRX for Sidelink UE to UE Relay Sony discussion Rel-18 NR\_SL\_relay\_enh

[R2-2308205](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2308205%20Discussion%20on%20UE-to-UE%20relay.doc) Discussion on UE-to-UE relay Huawei, HiSilicon discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2308220](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2308220-Remaining_issues_of_UE-to-UE_relay.doc) Remaining issues for UE-to-UE relay Sharp discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2308321](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2308321%20Discussion%20on%20U2U%20relay.docx) Discussion on U2U relay CMCC discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2308368](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2308368%20Considerations%20on%20U2U%20relay%20(re)selection%20and%20Local%20ID%20assignment.docx) Considerations on U2U relay (re)selection and Local ID assignment Nokia, Nokia Shanghai Bell discussion Rel-18 NR\_SL\_relay\_enh-Core R2-2305590

[R2-2308380](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2308380%20(R18%20SL%20Relay%20WI_AI792%20U2U%20Relays_Open).doc) Open Issues on Discovery, Relay Selection, and SRAP for UE to UE Relays InterDigital discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2308381](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2308381%20(R18%20SL%20Relay%20WI_AI792%20U2U%20Relay_QoS).doc) QoS and Configuration for L2 UE-to-UE Relays InterDigital discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2308469](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2308469_Discussion_on_Relay_reselection_Discovery.docx) Discussion on Relay (re)selection and Discovery Ericsson España S.A. discussion Rel-18

[R2-2308470](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2308470_Control_Plane_Procedures_for_L2_U2U_relays.docx) Control Plane Procedures for Layer 2 UE-to-UE Relays Ericsson España S.A. discussion Rel-18

[R2-2308611](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2308611-Discussion%20on%20Adaptation%20Layer%20for%20L2%20U2U%20Relay.doc) Discussion on Adaptation Layer for L2 U2U Relay ETRI discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2308721](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2308721%20Discussion%20on%20E2E%20PC5-RRC%20procedures.docx) Discussion on E2E PC5-RRC procedures ASUSTeK discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2308722](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2308722%20Discussion%20on%20AS%20layer%20configuration%20for%20L2%20U2U%20Relay.docx) Discussion on AS layer configuration for L2 U2U Relay ASUSTeK discussion Rel-18 NR\_SL\_relay\_enh-Core

### 7.9.3 Service continuity enhancements for L2 UE-to-network relay

Inter-gNB direct/indirect path switching; intra-gNB indirect/indirect path switching; and inter-gNB indirect/indirect path switching, to be supported by reuse of solutions for the other scenarios.

[R2-2307945](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2307945_Discussion%20on%20the%20procedure%20for%20intra-gNB%20indirect%20to%20indirect%20path%20switch.docx) Discussion on the procedure for intra-gNB indirect to indirect path switch China Telecom discussion Rel-18 NR\_SL\_relay\_enh-Core

* Noted

Proposal 1: RAN2 to discuss the procedure for intra-gNB indirect-to-indirect path switch.

Proposal 2: RAN2 to capture the above procedure description and message flow figure in TS 38.300 running CR.

Discussion:

China Telecom indicate the main difference from the current stage 2 is terminology (“source relay UE” and “target relay UE”), and there may also be procedural differences.

[R2-2307226](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2307226.docx) Discussion on service continuity enhancement Xiaomi discussion

Proposal 1: Separate thresholds for SL-RSRP and SD-RSRP are configured for the threshold1 in Z1.

Discussion:

Nokia think there are several ways separate thresholds could be defined, e.g., separate values or an offset or something more exotic. They do not want to decide now that the network must send two different values.

Huawei also think we should not commit to two different thresholds.

InterDigital do not quite see the concern, considering that we agreed to different thresholds for relay selection.

Apple support the proposal and think it would be strange if the UE reported the different quantities with the same threshold.

vivo also support the proposal and think the signalling details can be discussed.

Qualcomm are fine with P1 but wonder if we would extend the agreement to other events. Xiaomi think we would not revisit Rel-17 events, but for Rel-18 any new events could be discussed.

Samsung think we should not make a different decision here than for relay selection. They think we might need similar behaviour for other Rel-18 events.

NEC have some concern; they do not want to block the proposal, but think that since we are reusing Rel-17 principles generally, we should be careful about this change. They are not sure how to handle the interaction with Rel-17 issues.

Ericsson have some sympathy with Nokia, but they think the principle could be OK if captured carefully; e.g., the network need not provide different thresholds.

Proposal 2: SL-PathSwitchConfig is reused during i2i path switch.

Proposal 3: Source gNB sends the measurement result of candidate relay UE to target gNB.

Discussion:

CMCC understand RAN3 have concluded this information is not needed. CATT have the same understanding. ZTE think RAN3 did not intend to exclude that RAN2 could further discuss the issue, and they think it is beneficial.

LG prefer this solution, but they think there is some difficulty because RAN3 agreed to use an XnAP message instead of an INM. So they think it may make more sense not to pursue it.

Proposal 4: Target node generates the RRCReconfiguration including SL-PathSwitchConfig and sends it to source gNB. Source gNB forwards the received RRCReconfiguration message to remote UE.

Agreements:

Separate thresholds for SL-RSRP and SD-RSRP can be configured for the threshold1 in Z1. This does not imply that the network is required to configure two different values.

The SL-PathSwitchConfig IE (target relay UE ID and T420) is reused during i2i path switch.

Target node generates the RRCReconfiguration including SL-PathSwitchConfig and sends it to source gNB. Source gNB forwards the received RRCReconfiguration message to remote UE.

[R2-2307281](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2307281%20SL%20Relay%20Service%20Continuity.docx) SL Relay service continuity considerations Nokia, Nokia Shanghai Bell discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2307549](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2307549_Remaining%20issues%20on%20service%20continuity%20enhancement%20for%20L2%20U2N%20relay.docx) Remaining issues on service continuity enhancement for L2 U2N relay vivo discussion

[R2-2307552](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2307552%20Further%20Consideration%20on%20Service%20Continuity%20Enhancements.docx) Further Consideration on Service Continuity Enhancements CATT discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2307733](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2307733%20Discussion%20on%20measurement%20quantity%20configuration.doc) Discussion on measurement quantity configuration Samsung discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2307744](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2307744-Service%20continuity.docx) Proposal on additional enhancements for service continuity Qualcomm Incorporated discussion NR\_SL\_relay\_enh-Core

[R2-2307856](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2307856%20path%20switching%20to%20IDLE%20or%20INACTIVE%20relay%20UE.doc) Discussion on path switching to IDLE/INACTIVE relay Apple discussion Rel-18

[R2-2307940](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2307940_Discussion%20on%20Remaining%20Issues%20of%20Service%20Continuity.docx) Discussion on Remaining Issues of Service Continuity NEC Corporation discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2307990](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2307990%20Discussion%20on%20enhanced%20path%20switching%20v2.0.docx) Discussion on enhanced path switching Lenovo discussion Rel-18

[R2-2308102](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2308102_Further%20discussion%20on%20service%20continuity%20for%20SL%20relay.doc) Further discussion on service continuity for SL relay ZTE, Sanechips discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2308162](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2308162.doc) Service continuity enhancements for UE sidelink relay Sony discussion Rel-18 NR\_SL\_relay\_enh

[R2-2308221](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2308221-Remaining_issues_for_U2N_path_switching.doc) Remaining issues for U2N path switching Sharp discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2308322](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2308322%20Discussion%20on%20service%20continuity.docx) Discussion on service continuity CMCC discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2308471](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2308471_Discussion_on_Inter_gNB_Service_Continuity.docx) Discussion on Inter-gNB Service Continuity Ericsson España S.A. discussion Rel-18

[R2-2308584](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2308584%20Discussion%20on%20service%20continuity.docx) Discussion on 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). This agenda item will include a rapporteur contribution summarising open issues from RAN2#121 (invited contribution not counted against the tdoc limit).

Including report of [Post122][403][Relay] Procedures for multi-path relay (LG)

Email discussion summary

[R2-2307973](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2307973%20Report%20of%20%5bPost122%5d%5b403%5d%5bRelay%5d.doc) Report of [AT121bis-e][419][Relay] Remaining high-priority proposals on multi-path (LG) LG Electronics France report Rel-18 NR\_SL\_relay\_enh

* Revised in R2-2308950 (title correction)

[R2-2308950](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2308950%20Report%20of%20%5bPost122%5d%5b403%5d%5bRelay%5d.doc) Report of [Post122][403][Relay] Procedures for multi-path relay (LG) LG Electronics France report Rel-18 NR\_SL\_relay\_enh

Proposal 1: Consider the above updated procedures (except direct/indirect path change in Scenario 2) and FFS issues as a baseline and future work.

Discussion:

Qualcomm want to clarify that the list of FFS issues is not exhaustive; there can be other FFS issues. LG confirm it is not intended to cover everything.

Qualcomm also clarify we did not cover the RAN3 part.

Apple wonder about the meaning of “baseline”; there are FFSs, but for the points without them, do we still have flexibility to change? Chair understands that it raises the bar for changes.

Samsung think the stage 2 CR has been provided and could be reviewed directly.

Lenovo think P1 is very general, and we could look at the details of P2/P3.

Apple think we could say that this is a baseline for future work.

ZTE think we do not need to capture everything; we can select the important ones, and they think some downscoping is needed in P2/P3.

Agreement:

The procedures (except direct/indirect path change in Scenario 2) from R2-2308950 are taken as a baseline for future work on the RAN2 aspects of multi-path relay.

Proposal 2: RAN2 is requested to include at least the following updated procedures in the running CR to 38.300, possibly with corrections and additional inputs.

 For Scenario 1

 Direct path addition in section 1.1

 Indirect path addition in section 1.2

 For Scenario 2

 Indirect path addition in section 2.1

Proposal 3: RAN2 is requested to discuss whether to include the following updated procedures in the running CR to 38.300, possibly with corrections and additional inputs.

 For Scenario 1

 Direct path change in section 1.3

 Indirect path change in section 1.4

 Direct path release in section 1.7

 Indirect path release in section 1.8

 For Scenario 2

 Indirect path release in section 2.6

Discussion:

Qualcomm think path change and path addition could be merged.

OPPO agree with ZTE that the release procedures could be omitted; for merging addition and change, they think the current wording has been reviewed and it might be better to keep it.

NEC agree with OPPO and think merging can be discussed in stage 2 CR implementation.

LG think there may not be much interest in capturing the release procedures.

CATT wonder if the change procedures are only for Scenario 1. LG indicate we do not have agreement that change is supported for Scenario 2.

Agreements:

Include at least the following updated procedures in the running CR to 38.300.

 For Scenario 1:

 Direct path addition in section 1.1

 Indirect path addition in section 1.2

 For Scenario 2:

 Indirect path addition in section 2.1

Include the following updated procedures in the running CR to 38.300.

 For Scenario 1:

 Direct path change in section 1.3

 Indirect path change in section 1.4

FFS (for discussion in CR implementation) if the change procedures for scenario 1 can be merged with path addition.

Agenda item summary (excluding items related to the email discussion)

[R2-2308949](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2308949%20%5bPre123%5d%5b405%5d%5bRelay%5d%20Summary%20of%20AI%207.9.4%20on%20Multi-path%20relay.docx) Offline 402 on A.I 7.9.4 Multi-path relaying Nokia discussion NR\_SL\_relay\_enh-Core

Proposals for agreement

Proposal 1-1: RAN2 confirm the working assumption below:

For Scenario-1/2, MP remote UE is configured with a single cell group, i.e., MCG, for the direct path, and SL configuration, for the indirect path.

For scenario 1, primary path of the split SRB1 and SRB2 is always configured on direct path. And UE switches the primary path to the indirect path for reporting after direct path failure, and this switching is limited to the case where duplication is not configured as in legacy.

For Scenario 2, leave it to relay and remote UE implementation on how to trigger the RRC\_IDLE/RRC\_INACTIVE target relay UE to initiate RRC connection establishment procedure.

Proposal 2.1: For scenario 1, non-split SRB on the indirect path is not supported.

Discussion:

Xiaomi wonder how we would specify it: Is it a restriction in the ASN.1 or gNB implementation? Nokia think this is more of a stage 3 detail discussion.

Samsung wonder if we should also consider this for scenario 2.

Proposal 4.1.1: T304 timer is reused for the direct path addition/change.

Proposal 4.1.2: Start/stop condition of T304 for direct path addition/change will be discussed after the signalling procedure for direct path addition/change is concluded.

Discussion:

Nokia indicate there is no major technical argument on introducing a new T304-like timer vs. reusing the existing one.

Apple wonder what the criterion is for using a new timer. They understand that if we reuse T304, we will have to differentiate this case in the table.

Xiaomi prefer to reuse the existing timer. NEC also prefer to reuse the existing timer, and they wonder if P4.1.2 means we would wait for stage 2 CR finalisation. Nokia think more discussion on this is needed.

Apple wonder how much difference there would be between the legacy timer and a new one.

OPPO think it would be quite similar to the existing timer. LG share the view with OPPO.

vivo think the start/stop conditions can be covered by the existing language and we could reuse the current timer.

Proposal 4.2.1: The T420 timer is reused for the indirect path addition/change.

Proposal 4.2.2: The T420 timer starts when RRCReconfiguration message for the indirect path addition/change procedure is received.

Discussion:

Xiaomi think this is a bit different from T304, because the stop condition is very different from legacy. Nokia think this was not proposed in the inputs.

Apple think the proposal is incompatible with one of the proposals below. Nokia acknowledge there is a mistake below and P4.3.2 should not be there.

Huawei think a new timer would be cleaner from RRC specification pov, because of different triggering conditions. Qualcomm also think a new timer should be used for this reason.

vivo think whether to use a new timer or not should be a secondary question; the main question is the timer behaviour.

LG do not have a strong view, but they have some sympathy with other companies’ view for a new timer considering the start and stop conditions.

InterDigital think the issue is whether the procedures would be different.

NEC think the start/stop conditions compared with T420 will be quite similar, so they do not see a strong motivation for a new timer.

ZTE think start, stop, and expiry will all be different, so they slightly prefer the new timer.

Proposal 6.1: Support of case G in scenario 2 is deprioritized.

Discussion:

CMCC think this has been discussed extensively and there have been no technical arguments against it; they think the handling is simple and they do not want to exclude it. ZTE agree that case G can be supported; compared with scenario 1, the remote UE does not need to establish the PC5 connection, and they think the support is easy.

Samsung also support case G in scenario 2 and do not see much additional work.

InterDigital think it would require a new flow in 38.300 and other work, and they would prefer to have it not supported.

Qualcomm think support of case G does not need additional effort.

OPPO think it does not come for free; their main concern is about the use case, where it seems that one remote can be paired with multiple relay UEs, and then the network has to indicate which relay can be paired. They understand that in an ideal case there is no chance to change the indirect path (e.g., wired). Apple have the same understanding as OPPO. Ericsson agree with OPPO.

Nokia indicate the reason for the proposal is more about motivation than impact. They agree with OPPO/Apple/Ericsson.

Huawei think CMCC’s use case is valid: The indirect path change can be used for failure recovery, and they note that we agreed the indirect path failure in scenario 2 can be reported to the network. They think there is no spec impact and do not see a reason to exclude it.

Qualcomm think we already agreed it would be remote UE implementation to select the candidate relays, and in some non-3GPP cases the indirect path could change.

Xiaomi see different understandings on whether there is spec impact, and they think it could go offline to investigate this.

LG think it is clear that there is spec impact, because the UE has to report multiple candidate relay UEs and there is an issue on how gNB selection is confirmed at the remote side. They understand the consequence of not having it is that if failure happens, the gNB will release the indirect path and the remote UE can report again and trigger the addition procedure. So they see this as a discussion about whether to optimise the procedure instead of having a release-and-add.

InterDigital have the same understanding as LG, and they note that the WID says scenario 2 should reuse the procedures of scenario 1, so the additional impact seems to contradict the WID.

Samsung think the opponents for case G are arguing from a use case with a wired line, but as Qualcomm indicated there are other possible connections. They do not see that we need to restrict to a wired link.

Nokia think we can use release-and-add, and the question is whether to optimise it to one RRC message.

Chair asks how important the optimisation is.

Huawei see limited spec impact and do not see why we would not support it.

Qualcomm think we should treat scenarios 1 and 2 equally, and in scenario 1 we optimise. They also do not see big standards impact.

Samsung think the main difference is how to report the candidate UEs, and they see this as quite a small impact.

Apple think the reason we have candidate relay UEs is because we have measurements, and measurements cannot apply in scenario 2; the remote UE can only select the relay itself.

LG agree with Apple and think we are a bit off from the original proposal.

Ericsson think we can use release-and-add, and reporting candidate relays to the gNB in scenario 2 will be a bit meaningless since the gNB cannot select based on anything.

Huawei think there is a clear gain based on the number of messages and roundtrips, and the gNB knows the Uu conditions of the candidates.

LG think Ericsson have a good point; the report of the multiple candidate relay UEs is meaningless to the gNB. They think failure information can be useful, but they do not see a benefit from multiple candidate UEs.

ZTE think the multiple candidate UEs are useful, because of the gNB knowing the Uu conditions. Samsung share the same understanding, and they think how many relay UEs are reported is a remote UE implementation issue.

Nokia think there is an expectation of the gNB implementation, and it seems likely that the gNB will select randomly from among multiple candidates, so they think it is not only a matter of spec impact but also gNB implementation impact.

Show of hands:

Support case G: 9

Do not support case G: 5

* [AT123][432][Relay] Spec impact of case G in scenario 2 (Xiaomi)

Scope: Evaluate the spec impact of supporting case G in scenario 2 in as much detail as feasible. The objective should be to be able to discuss the impact/gain tradeoff in the CB session.

Intended outcome: Report to CB session in R2-2309174

Deadline: Thursday 2023-08-24 2000 UTC

Proposal 7.4: In packet duplication, the PDCP entity shall not indicate to the Uu RLC entity to discard the PDCP PDU when the PC5 RLC entity acknowledges the transmission of the PDCP PDU. FFS for the case where Uu RLC entity acknowledges the transmission of a PDCP PDU.

Discussion:

InterDigital agree with the first part; the point is that we don’t know if the packet has gone end-to-end to the network. For the second part, they think we should use the legacy behaviour.

NEC have the same understanding as InterDigital. They think the real FFS is when PDCP can discard the buffer without needing to expect an acknowledgement.

Samsung wonder if we are considering in the FFS how to deal with the packet at the relay UE side or the remote UE side. Nokia indicate it is the remote UE, and there is no intention to have PDCP discard the buffer based on a new condition.

Samsung think it is OK for the remote UE side, and they wonder how to deal with the packet at the relay UE side. Nokia understand that the duplication at the gNB is not a problem and the gNB will just discard the duplicate based on sequence number.

Proposal 8: RAN2 deprioritize the discussion on path/flow control.

Agreements:

Confirm the following WAs:

For Scenario-1/2, MP remote UE is configured with a single cell group, i.e., MCG, for the direct path, and SL configuration, for the indirect path.

For scenario 1, primary path of the split SRB1 and SRB2 is always configured on direct path. And UE switches the primary path to the indirect path for reporting after direct path failure, and this switching is limited to the case where duplication is not configured as in legacy.

For Scenario 2, leave it to relay and remote UE implementation on how to trigger the RRC\_IDLE/RRC\_INACTIVE target relay UE to initiate RRC connection establishment procedure.

For scenario 1, non-split SRB on the indirect path is not supported.

T304 timer is reused for the direct path addition/change.

A new T420-like timer is introduced for the indirect path addition/change.

In packet duplication for scenario 1, the PDCP entity need not indicate to the Uu RLC entity to discard the PDCP PDU when the PC5 RLC entity acknowledges the transmission of the PDCP PDU. FFS if this requirement can be stronger (“shall not”), to be discussed in CR development.

In packet duplication for scenario 1, in the case where Uu RLC entity at the remote UE acknowledges the transmission of a PDCP PDU, the PDCP entity shall indicate to the PC5 RLC entity to discard the PDCP PDU.

Proposals for discussion

Easily agreeable:

Proposal 2.2: RAN2 discuss whether different bearer type can be configured for SRB1 and SRB2.

Discussion:

Nokia indicate we agreed that the configuration could be independent, but not necessarily different bearer types.

LG think it is up to network implementation, and if there is a problem we can come back. They do not think we need to discuss it now. Samsung agree.

Proposal 2.3: RAN2 discuss whether the primary path of the split DRB can be set to either the direct path or the indirect path, or is fixed to the direct path as split SRB.

Discussion:

InterDigital recall that we agreed it could be on either.

Proposal 7.3: RAN2 discuss whether LCH-to-carrier restriction is not required for packet duplication over sidelink multi-path.

Discussion:

Xiaomi indicate we only have one sidelink carrier. Samsung think it depends on whether we support CA on the direct path, and they think it would be natural to support this.

InterDigital see Samsung’s scenario as valid, but also another scenario where we need to avoid having the remote and relay UE use the same carrier for duplicated data.

LG note that we do not restrict to only a single sidelink carrier.

Nokia think InterDigital’s scenario is not about the remote UE but the relay UE.

Need more discussion:

Proposal 3.1: RAN2 discuss whether additional information such as measurement result, OoC indication, buffer information, can be included in MCGFailureInformation when reporting the direct path failure.

Discussion:

Xiaomi think the measurement result of candidate cells is already there, so it is not additional information. They do not see the other information as beneficial. Samsung have the same view.

Kyocera think the measurements are about SCG, not PC5 candidates. They think the OOC indication could be used when the UE cannot find any suitable cell.

OPPO think Xiaomi’s comment is not quite right, because if the objective is to find candidate cells, the information is there, but they understand the intention is to add further measurements on top of that.

Lenovo think measurement results for the candidate relays are needed. Nokia think for relay reselection this may be true, but for multi-path it may depend on what the UE prefers.

Proposal 3.2: For scenario 1 and 2, RAN2 discuss which message is used for report of indirect path failure from 1) MCGFailureInformation, 2) SidelinkUEInformationNR, and 3) a new message.

Proposal 3.3.1: RAN2 discuss whether failure detection on the existing path while additional path addition is an issue to be resolved. FFS how to resolve it if RAN2 agree to resolve it.

Proposal 3.3.2: RAN2 discuss whether the gNB can configure a condition not to report the RLF.

Proposal 4.1.3: For the expiry of the new T304-like timer, RAN2 discuss the followings:

- In which condition the UE reports the failure of the direct path addition/change

- In which condition the UE reverts to the prior path operation

- In which condition the UE initiates RRC connection re-establishment

Proposal 4.2.3: For the stop of the T420 timer, RAN2 discuss the following options:

- Option 1. Reuse T420 condition, i.e., upon successful sending of RRCReconfigurationComplete message

- Option 2. When PC5-RRC connection establishment is completed

- Option 3. When relay UE is successfully connected to the gNB

- Option 4. When PC5-RRC connection establishment completes, and relay UE is successfully connected to the gNB

Proposal 4.2.4: For the expiry of the T420 timer, Ran2 discuss the followings:

- In which condition the UE reports the failure of the indirect path addition/change

- Whether or if yes, in which condition the UE reverts to the prior path operation

- In which condition the UE initiates RRC connection re-establishment

- Whether additional information needs to be reported to the gNB

Proposal 4.3: RAN2 discuss whether the existing measurement events are sufficient for path addition/change/removal in multi-path operation. If not, discuss what events need to be introduced.

Proposal 5: When the remote UE receives notification message indication relay UE’s handover, RAN2 discuss two options:

1) to rely on network to release configuration of relay UE at remote UE before relay UE handover

2) rely on remote UE to suspend the indirect path upon reception of notification message indicating relay UE handover

Proposal 6.2: RAN2 discuss whether the remote UE reports the RRC\_IDLE and RRC\_INACTIVE relay UE’s ID, and if so, which ID is used.

Proposal 7.1: RAN2 discuss the followings:

1) Whether CA duplication is applied to the direct path of the remote UE. If yes, what is the maximum number of RLC entities over the direct path of the remote UE?

2) Whether CA duplication is applied to the Uu link of the relay UE. If yes, FFS any impact on the specification.

Proposal 7.2: RAN2 discuss how the duplication is activated/deactivated to a certain RLC entity when the remote UE receives the Duplication A/D MAC CE or Duplication RLC A/D MAC CE using a single MAC entity.

Proposal 9: RAN2 discuss if any issue needs to be discussed/resolved for BSR operation by focusing on essential issues from operation perspective than enhancement.

R2-2309174 (Report of [432]) Xiaomi discussion Rel-18 NR\_pos\_enh2

The following documents will not be individually treated

[R2-2307093](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2307093%20-%20Discussion%20on%20multi-path%20Relay_V02.docx) Discussion on multi-path SL relay OPPO discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2307182](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2307182%20Discussion%20on%20Multi-path%20relaying.docx) Discussion on Multi-path relaying Lenovo discussion NR\_SL\_relay\_enh-Core

[R2-2307227](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2307227.docx) Discussion on multi-path Xiaomi discussion

[R2-2307363](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2307363%20-%20Discussion%20on%20non-split%20SRB.docx) Discussion on non-split SRB OPPO, Samsung, China Telecom, Huawei, HiSilicon, Ericsson, vivo, CMCC discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2307387](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2307387%20Discussion%20on%20remaining%20CP%20issue%20of%20U2N%20multi-path%20relay.docx) Discussion on remaining issue of multi-path relay NEC discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2307403](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2307403%20Discussions%20on%20Multi-path.docx) Discussions on multi-path Fujitsu discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2307550](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2307550_Remaining%20Issues%20for%20Multi-path%20Scenario%201%202.docx) Remaining Issues for Multi-path Scenario 1 2 vivo discussion

[R2-2307553](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2307553%20Discussion%20on%20Multi-path.docx) Discussion on Multi-path CATT discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2307656](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2307656_FhG_SL-Relay_Throughput_Enhancements.docx) Throughput Enhancement in U2N Relaying Fraunhofer IIS, Fraunhofer HHI discussion Rel-18 NR\_SL\_relay\_enh

[R2-2307719](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2307719_Discussion%20on%20multi-path%20scenario%201_III.docx) Discussion on multi-path scenario 1 III discussion NR\_SL\_relay\_enh-Core

[R2-2307745](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2307745-open%20issues%20for%20MP%20relay.docx) Open issues on multi-path relay for scenario 1 and scenario 2 Qualcomm Incorporated discussion NR\_SL\_relay\_enh-Core

[R2-2307751](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2307751_multipath_relay.docx) Considerations for multipath relay operations for Scenario 1 Kyocera discussion Rel-18

[R2-2307857](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2307857%20Discussion%20on%20Multi-path.doc) Discussion on Multi-path Relay Apple discussion Rel-18

[R2-2307941](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2307941_Discussion%20on%20UP%20Issues%20of%20Multi-path%20Relaying.docx) Discussion on UP Issues of Multi-path relay NEC Corporation discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2307946](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2307946%20Discussion%20on%20remaining%20issues%20of%20multi-path%20relaying%20in%20scenario%201.docx) Discussion on remaining issues of multi-path relaying in Scenario 1 China Telecom discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2307947](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2307947%20Discussion%20on%20remaining%20issues%20of%20multi-path%20relaying%20in%20scenario%202.docx) Discussion on remaining issues of multi-path relaying in Scenario 2 China Telecom discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2307991](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2307991%20Procedure%20for%20second%20path%20addition%20v1.0.docx) Procedure for second path addition Lenovo discussion Rel-18

[R2-2308103](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2308103%20Further%20discussion%20on%20the%20support%20of%20multi-path%20relaying.docx) Further discussion on the support of multi-path relaying ZTE, Sanechips discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2308120](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2308120%20Discussion%20on%20multi-path%20relaying.doc) Discussion on multi-path relaying Spreadtrum Communications discussion Rel-18

[R2-2308163](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2308163.doc) Multi-path relaying discussion Sony discussion Rel-18 NR\_SL\_relay\_enh

[R2-2308206](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2308206%20Remaining%20issues%20on%20multi-path%20operation.docx) Remaining issues on multi-path operation Huawei, HiSilicon discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2308222](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2308222-Remaining_issues_for_multi-path_relay.doc) Remaining issues for multi-path relay Sharp discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2308224](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2308224_SLRelay_v1.2.docx) Discussion on remaining issues on multiple path for sidelink relay Samsung discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2308323](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2308323%20Discussion%20on%20multi-path%20scenario%201.docx) Discussion on multi-path scenario 1 CMCC discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2308324](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2308324%20Considerations%20on%20multi-path%20scenario%202.docx) Considerations on multi-path scenario 2 CMCC discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2308382](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2308382%20(R18%20SL%20Relay%20WI_AI794%20MultipathAspects_UP).doc) User Plane Aspects for Multipath InterDigital discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2308383](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2308383%20(R18%20SL%20Relay%20WI_AI794%20MultipathAspects_CP).doc) Control Plane Aspects for Multipath InterDigital discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2308472](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2308472_Discussion_on_multipath%20relays.docx) Discussion on Multipath Relays Ericsson España S.A. discussion Rel-18

[R2-2308723](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2308723%20BSR%20reporting%20for%20Multi-path%20Scenario%202.docx) BSR reporting for Multi-path Scenario 2 ASUSTeK discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2308724](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2308724%20Discussion%20on%20duplicate%20PDCP%20PDU%20discarding%20for%20Multi-path%20transmission%20Scenario%201.docx) Discussion on duplicate PDCP PDU discarding for Multi-path transmission Scenario 1 ASUSTeK discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2308749](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2308749%20Multipath%20SL%20relay.docx) On Remaining issues on multipath SL relay Nokia, Nokia Shanghai Bell discussion NR\_SL\_relay\_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.

[R2-2308369](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2308369%20Considerations%20on%20paging%20and%20DRX%20for%20sidelink%20relay.docx) Considerations on DRX and paging for sidelink relay Nokia, Nokia Shanghai Bell discussion Rel-18 NR\_SL\_relay\_enh-Core R2-2305592

* Noted

Observation 1: If the remote UE’ paging message is sent by the NW using eDRX paging cycle while the L2 relay UE doesn’t support the eDRX feature L2 relay UE is not able to monitor the paging message.

Proposal 1: RAN2 to agree that the eDRX issue should be solved in release-18.

Proposal 2: RAN2 to select between introducing relay UE’s capability on support of eDRX in relay discovery message (option 1) or enabling relay UE and the remote UE can exchange their eDRX capability using SL RRC signaling (option 2) to address the eDRX issue.

Discussion:

Nokia indicate that if this is not resolved, they think the network may need to disable eDRX.

CATT doubt if eDRX is in the WID scope.

vivo understand the power saving session discussed something about relays, and they are concerned about time.

LG think eDRX is for extreme power saving, and the indirect path can also be for power saving on the remote UE; since the remote UE does not monitor paging directly but via the relay UE, they think eDRX may not be critical for a remote UE.

Ericsson think it is not clear that we need to do anything for DRX, and this seems to be orthogonal to the sidelink DRX topic.

[R2-2308207](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2308207%20Discussion%20on%20sidelink%20DRX%20for%20L2%20U2N%20relay.doc) Discussion on sidelink DRX for L2 U2N relay Huawei, HiSilicon discussion Rel-18 NR\_SL\_relay\_enh-Core

Proposal 1: How the remote UE can determine the assistance information is left to UE implementation.

Proposal 2: To reduce the access delay caused by SL DRX, remote UE should disable SL DRX after sending the first RRC message during RRC setup/RRC resume procedure and relay UE should disable SL DRX after receiving the first message on SL-RLC0/SL-RLC1.

Discussion:

Qualcomm think a NOTE might be useful for P1; Apple think this is the default behaviour and we do not need anything in the spec.

Xiaomi also think this is normal behaviour even in the non-relay case, so maybe no agreement at all is needed.

OPPO indicate it is already captured in 38.331 for the general case.

Apple do not agree with P2 and think we should not force the remote UE to do this; it can always be disabled by PC5 signalling based on the existing mechanism, but they do not think it should be required.

Huawei think there could be situations where SL DRX causes a delay.

Xiaomi wonder if Apple’s solution means the remote UE needs to wait for the completion message; in this case, the delay could not be avoided.

OPPO have a similar view to Apple; we do not need specific behaviour from remote UE side. They think the current signalling can already implement the proposed functionality.

InterDigital agree with OPPO and Apple.

Agreements:

How the remote UE can determine the assistance information for sidelink DRX is left to UE implementation (as in legacy operation).

Rely on legacy operation for control of SL DRX during RRC setup/resume procedure.

[R2-2307228](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2307228.docx) Discussion on SL DRX in U2N relay Xiaomi discussion

[R2-2307234](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2307234%20-%20Discussion%20on%20DRX%20for%20L2%20U2N%20relay.docx) Discussion on DRX for L2 U2N relay OPPO discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2307554](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2307554%20Discussion%20on%20DRX%20for%20L2%20U2N%20Relay.docx) Discussion on DRX for L2 U2N Relay CATT discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2307858](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2307858%20Discussion%20on%20SL-DRX.doc) Discussion on SL DRX for L2 UE-to-NW relay Apple discussion Rel-18 R2-2305065

## 7.24 NR TEI18

Specific items may be allocated to a breakout session for treatment.

Time budget: 1 TU

### 7.24.1 TEI proposals by Other Groups

Items initiated by other groups that is/has been communicated by LS, where the other group indicate this is TEI18. (Specific other-group-WIs should use the R18 Other Agenda Item below).

[R2-2307009](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2307009_R1-2306212.doc) LS on 1-symbol PRS (R1-2306212; contact: ZTE) RAN1 LS in Rel-18 TEI18 To:RAN2 Cc:RAN3, RAN4

[R2-2308140](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2308140%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 17.5.0 4014 3 B TEI18 R2-2306793

* Agreed in principle with alignment of the terminology to the ASN.1 names

[R2-2308141](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2308141%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 17.5.0 0437 3 B TEI18 R2-2306794

* Agreed in principle (to be merged into a single LPP CR)

[R2-2308142](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2308142%20Introduction%20of%20UE%20capability%20of%201-symbol%20PRS%20in%2037.355%5b1symbol_PRS%5d.docx) Introduction of UE capability of 1-symbol PRS in 37.355[1symbol\_PRS] ZTE Corporation CR Rel-18 37.355 17.5.0 0453 2 B TEI18 R2-2306795

* Agreed in principle (to be merged into a single LPP CR)

[R2-2308143](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2308143%20Introduction%20of%20UE%20capability%20of%201-symbol%20PRS%20in%2038.331%5b1symbol_PRS%5d.docx) Introduction of UE capability of 1-symbol PRS in 38.331[1symbol\_PRS] ZTE Corporation CR Rel-18 38.331 17.5.0 4128 2 B TEI18 R2-2306796

* Endorsed to be merged into mega CR

[R2-2308144](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2308144%20Introduction%20of%20UE%20capability%20of%201-symbol%20PRS%20in%2038.306%5b1symbol_PRS%5d.docx) Introduction of UE capability of 1-symbol PRS in 38.306[1symbol\_PRS] ZTE Corporation CR Rel-18 38.306 17.5.0 0923 2 B TEI18 R2-2306797

* Endorsed to be merged into mega CR

Discussion:

Huawei are fine with the proposals, but they wonder if the LPP CR needs to be split.

ZTE think separate CRs for functionality and capabilities are cleaner.

Ericsson think we should have one LPP CR. Qualcomm agree and think the CR can be self-contained.

Lenovo think a merged CR is OK. On the RRC CR, they suggest replacing “Type C” and “Type C+D” with the ASN.1 names.

CATT think there is a coversheet issue: The CR numbers for the other specs should be included in the coversheets. Qualcomm think there is no functional interaction between them and we do not need the cross-reference.

### 7.24.2 TEI proposals by RAN2

Items initiated in RAN2.

Tdoc limitation: 1 tdoc, limitation only applicable for non-previously-agreed-to-be-considered TEI proposals.

Relay: paging cause forwarding [previously seen]

[R2-2307176](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2307176_Paging%20Cause%20forwarding.doc) Paging Cause forwarding Samsung Electronics Co., Ltd discussion Rel-18 TEI18

[R2-2307694](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2307694_Discussion%20on%20MUSIM%20paging%20cause%20forwarding.docx) Discussion on MUSIM paging cause forwarding vivo discussion Rel-18

Relay: emergency cause value [previously seen]

[R2-2307237](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2307237%20-%20Discussion%20on%20emergency%20cause%20value%20for%20SL%20Relay.docx) Discussion on emergency cause value for SL Relay OPPO discussion Rel-18 NR\_SL\_relay\_enh-Core, TEI18

Relay: voice/video support [previously seen]

[R2-2308932](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2308932_Considerations%20on%20voice%20and%20video%20support%20for%20Relays.docx) Considerations on voice and video support for Relays Philips International B.V., FirstNet, InterDigital, KPN, TNO, discussion Rel-18 R2-2306516

Positioning: multiple QoS [previously seen]

[R2-2307342](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2307342.docx) Multiple QoS for positioning MediaTek Inc. discussion Rel-18 TEI18

* Noted

[R2-2308830](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2308830%20(7.24.2)%20multiple%20QoS%20handling%20in%20POS%20TEI%2018.docx) Introduction of ‘multiple QoS’ class in positioning Samsung Electronics Romania discussion

* Noted

Proposal 1. When LMF receives the service request with multipleQoS class from LCS client, multiple set of (H-/V-) accuracy values per QoS level same as LMF received from LCS client can be indicated to LPP location information request procedure.

Proposal 2. If UE receives LPP Request Location Information including multiple QoS, UE should evaluate whether the obtained location estimate fulfils the accompanied accuracy requirements for all the given QoS.

Proposal 3. Once the measured result/ location estimate fulfils any accuracy requirements among indicated ones, UE should report the measurement result/location estimate with the indication of the highest preferred accuracy values among fulfilled ones.

Proposal 4. This proposed operation is only applicable to the UE-based positioning.

Discussion:

Qualcomm indicate they checked the SA2 specs and confirmed that the multiple QoS is supported only for deferred MT-LR, which does not affect LPP, so they do not see interaction of the feature with LPP. They understand that the network will try multiple times, typically with different positioning methods.

vivo agree with Qualcomm; the proposal indicates that it derives from SA2, but SA2 specified that the multiple QoS feature is realised through multiple location requests.

MediaTek are concerned that there could be a “lazy UE” problem where the UE only meets the loosest QoS, and agree that SA2 did not put a UE requirement.

Samsung agree that there is no explicit requirement from SA2, but they see that the proposal can reduce LPP signalling overhead. On the “lazy UE” problem, they understand that the UE should make a best effort in any positioning operation.

Apple agree with MediaTek that the feature is not testable; they think the value is not clear.

OPPO agree with Qualcomm that multiple QoS normally means the LMF will try different positioning methods. On the “lazy UE” problem, they agree that the problem exists, but they think the MediaTek proposal does not solve the problem.

Nokia do not see the value, and they understand that multiple QoS in SA2 has no RAN impact.

Intel also do not see RAN2 impact.

Positioning: SSR PCV residuals [previously seen]

[R2-2307757](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2307757.docx) Support for SSR Satellite PCV Residuals Swift Navigation discussion

Proposal 1: RAN2 agrees to introduce the SSR IOD Update IE.

Proposal 2: RAN2 agrees to add the posSIBs for the SSR Satellite PCV Residuals.

Proposal 3: RAN2 agrees to adopt the proposed CRs for the SSR Satellite PCV Residuals.

Discussion:

Qualcomm understand that the proposals introduce a new IE covering the IOD (option 4 in the discussion paper), and they wonder if option 3 would be simpler without requiring a new posSIB. They agree that the proposed approach works, but it forces the new posSIB. Swift indicate that the reason for preferring option 4 was consistency with other bodies working on SSR messages (e.g., RTCM), as well as extensibility in the future. They also indicate that option 3 would require resetting corrections when a new set of PCVs is issued, whereas this option allows a softer update without forcing a reset.

Qualcomm can accept the proposal, but they think RTCM have a different message structure, and we may be better positioned to extend our message formats.

Ericsson think we could go offline for the details.

* [AT123][422][POS] SSR PCV residuals (Swift)

Scope: Discuss the TPs from R2-2307757 and develop a set of CRs.

Intended outcome: Agreeable (in principle) CRs:

* 36.305: R2-2309112
* 38.305: R2-2309113
* 37.355: R2-2309114
* 36.331: R2-2309115
* 38.331: R2-2309116

Deadline: Wednesday 2023-08-23 2000 UTC

[R2-2309112](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2309112.docx) SSR Satellite PCV Residuals [Rel18PCV] Swift Navigation CR Rel-18 36.305 17.5.0 0118 - C TEI18

[R2-2309113](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2309113.docx) SSR Satellite PCV Residuals [Rel18PCV] Swift Navigation CR Rel-18 38.305 17.5.0 0140 - C TEI18

[R2-2309114](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2309114.docx) SSR Satellite PCV Residuals [Rel18PCV] Swift Navigation CR Rel-18 37.355 17.5.0 0465 - C TEI18

[R2-2309115](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2309115.docx) SSR Satellite PCV Residuals [Rel18PCV] Swift Navigation CR Rel-18 36.331 17.5.0 4955 - C TEI18

[R2-2309116](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2309116.docx) SSR Satellite PCV Residuals [Rel18PCV] Swift Navigation CR Rel-18 38.331 17.5.0 4296 - C TEI18

* [Post123][405][POS] CRs on PCV residuals (Swift)

Scope: Update the CRs in R2-2309112 / R2-2309113 / R2-2309114 / R2-2309115 / R2-2309116 in accordance with received comments.

Intended outcome: AIP CRs

Deadline: Short (not for RP)

Positioning: NavIC enhancements [new]

[R2-2308193](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2308193.docx) NavIC L5 A-GNSS support updates to RRC protocol specification Reliance Jio CR Rel-18 38.331 17.5.0 4234 - F TEI18

Discussion:

CEWiT present in the absence of Reliance Jio.

Lenovo agree with the change but wonder if we should make the correction from Rel-17, since there are already NavIC posSIBs in Rel-17. MediaTek agree.

CATT agree that Rel-17 enabled NavIC and introduced the assistance data in LPP, but they understand that broadcast assistance data for NavIC is not fully enabled. They are fine to take the CR in Rel-18.

Qualcomm agree that this is more of a correction.

CEWiT can convert it to a Rel-17 correction. They would like to understand the details of CATT’s comment.

Lenovo think the coversheet can be clearer as well.

* [AT123][423][POS] NavIC broadcast correction (CEWiT)

Scope: Check the CR in R2-2308193 and adapt it to a Rel-17 correction.

Intended outcome: Agreeable CR in R2-2308978

Deadline: Wednesday 2023-08-23 2000 UTC

[R2-2308978](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2308978.docx) NavIC L5 A-GNSS support updates to RRC protocol specification Reliance Jio CR Rel-17 38.331 17.5.0 4234 1 F NR\_pos\_enh-Core

* Agreed

Positioning/relay: positioning for remote UEs [previously seen]

[R2-2308485](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2308485%20RelPos.docx) Relay based Positioning posSIB forwarding Ericsson, Deutsche Telekom, AT&T discussion Rel-18

[R2-2308486](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2308486%20RRC%20CR.docx) Information on posSIBs relaying to remote UE [PosL2RemoteUE] Ericsson, Deutsche Telekom, AT&T CR Rel-18 38.331 17.5.0 4254 - B TEI18

[R2-2308487](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2308487%20NRPPaForInfo.docx) Information on posSIBs relaying to remote UE Ericsson, Deutsche Telekom, AT&T draftCR Rel-18 38.455 17.5.0 B TEI18

Proposal 1 The information on which posSIBs can be relayed is optionally provided by the NW to the UEs.

Proposal 2 RAN2 to agree to the RRC CR as provided in R2-2308486.

Discussion:

Apple understood we agreed last meeting that the forwarding should be transparent to the relay UE, and they wonder if the proposal contravenes this agreement.

Qualcomm do not understand the relation of the described issue to posSIB forwarding; the LMF selects what positioning method to use, based on information that can include coverage/remote status, but they do not see what the difference is if the gNB forwards additional assistance data.

Ericsson think we have dimensioned the assistance data support and expected performance based on assumptions about coverage. They think there could be a latency cost if the first positioning operation uses a method that does not work well out of coverage.

MediaTek have the same understanding as Qualcomm.

Ericsson are concerned about an idle/inactive UE receiving broadcast assistance data.

Qualcomm do not see a connection to the RRC state; the LMF selects the positioning method and tells the UE what to measure, and the UE may or may not have assistance data via posSIBs, irrespective of the RRC state.

Ericsson understand that the posSIBs are a value-added service with encryption, which is the difference from other SIBs. They intend to enable selection of appropriate positioning methods based on coverage/remote status.

Intel understand that the LMF would select an appropriate positioning method, and they do not see that the network can enforce anything because the method selection is transparent to the gNB.

Samsung think this can be helpful to reduce unnecessary overhead from posSIB signalling that would not be useful (e.g., the UE requests a posSIB that doesn’t make sense out of coverage). However, they have the same understanding as other companies regarding network control.

OPPO wonder about the motivation to save signalling overhead for an out-of-coverage remote UE. They do not think the relay UE can differentiate whether the remote UE is in coverage, so they are wondering how it works. Qualcomm agree and think the proposal may make the signalling more excessive; they do not see how the gNB takes the decision on what can be forwarded, considering that the LMF selects the method.

MediaTek also see extra signalling if the LMF picks a positioning method, the UE tries to receive assistance data, and the network says “no”; the UE will just request the same assistance data from the LMF.

Ericsson understand that, e.g., DL-TDOA will not work well out of coverage. MediaTek do not understand the use case, since the LMF selects the positioning method and the UE presumably requests what it needs.

Qualcomm think there is nothing broken with broadcast: The system can provide the assistance data either way, and if it wants to save broadcast overhead, it will use unicast LPP.

Apple also think the remote UE can be out of coverage or in coverage, and it is not clear why the network would block the relay UE from forwarding the posSIBs.

Ericsson think we could go offline for discussion.

* [AT123][424][POS] Network control of posSIBs for remote UEs (Ericsson)

Scope: Discuss the proposal in R2-2308485 and determine if there is support for moving forward with it.

Intended outcome: Report to CB session in R2-2309107

Deadline: Wednesday 2023-08-23 2000 UTC

[R2-2309107](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2309107.docx) [AT123][424][POS] Network control of posSIBs for remote UEs (Ericsson) Ericsson discussion Rel-18

Proposal 1 No NW restriction is configured for posSIB forwarding.

Agreement:

No NW restriction is configured for posSIB forwarding.

[R2-2308695](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2308695_Discussion%20on%20positioning%20for%20L2%20U2N%20remote%20UE.docx) Discussion on positioning support for L2 U2N remote UE Samsung discussion Rel-18 TEI18

Proposal 1: Allow L2 U2N remote UE in RRC\_CONNECTED to request an SFN-DFN from the connected L2 U2N relay UE via RemoteUEInformationSidelink message as in the TP to 38.331 in Annex.

Proposal 2: Clarify that L2 U2N remote UE can include remoteUE-Indication-r18 in ProvideCapabilities message only when it has been requested by the LMF before as in the TP to 37.355 in Annex.

Proposal 3: Introduce a coverage indication to indicate whether the target device operating as a L2 U2N remote UE is located within the coverage of the serving cell (i.e., the serving cell of the relay UE) as in the TP to 37.355 in Annex.

Proposal 4: Update the field description for primaryCellID-r15 to allow the target device operating as a L2 U2N remote UE to report the identity of the current primary cell/camping cell for the L2 U2N Relay UE as in the TP to 37.355 in Annex.

Discussion:

Apple wonder why P1 is needed, because the UE in RRC\_CONNECTED sees signalling from the gNB. They think the gNB may be able to provide the offset.

Samsung think companies may need some time to review.

* [AT123][425][POS] Proposals on positioning for remote UE (Samsung)

Scope: Discuss the proposals in R2-2308695 and progress towards agreements where possible.

Intended outcome: Report to CB session in R2-2309170

Deadline: Wednesday 2023-08-23 2000 UTC

[R2-2309170](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2309170%20Report%20of%20%5bAT123%5d%5b425%5d%5bPOS%5d%20Proposals%20on%20positioning%20for%20remote%20UE%20(Samsung).docx) [AT123][425][POS] Proposals on positioning for remote UE (Samsung) Samsung discussion Rel-18

Proposal 1. Allow L2 U2N remote UE in RRC\_CONNECTED to request an SFN-DFN from the connected L2 U2N relay UE via RemoteUEInformationSidelink message. The TP to 38.331 in R2-2308695 can be merged into AIP RRC CR (R2-2306839).

Proposal 2: L2 U2N remote UE can include remoteUE-Indication-r18 in ProvideCapabilities message only when it has been requested by the LMF before. The correction on the conditional presence code ‘NR’ in the TP to 37.355 in R2-2308695 can be merged into AIP LPP CR (R2-2305854).

Proposal 3. The correction on the field description for primaryCellID-r15 is not essential.

Agreements:

Allow L2 U2N remote UE in RRC\_CONNECTED to request an SFN-DFN from the connected L2 U2N relay UE via RemoteUEInformationSidelink message. The TP to 38.331 in R2-2308695 can be merged into AIP RRC CR (R2-2306839).

L2 U2N remote UE can include remoteUE-Indication-r18 in ProvideCapabilities message only when it has been requested by the LMF before. The correction on the conditional presence code ‘NR’ in the TP to 37.355 in R2-2308695 can be merged into AIP LPP CR (R2-2305854).

The correction on the field description for primaryCellID-r15 is not essential.

Positioning: BT AoA/AoD [new]

[R2-2308489](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2308489%20Bluetooth.docx) Adding support for Bluetooth AoA/AoD Ericsson, AT&T, Polaris Wireless, u-blox discussion Rel-18

* Revised in R2-2308955

[R2-2308955](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2308955%20Bluetooth.docx) Adding support for Bluetooth AoA/AoD Ericsson, AT&T, Polaris Wireless, u-blox, T-Mobile discussion Rel-18

Proposal 1 Discuss and agree to introduce support for Bluetooth AoA/AoD positioning in the LPP Bluetooth positioning method

Proposal 2 Endorse the draft CR in the Appendix

Discussion:

Qualcomm are unsure of the objectives of the additional parameters in the CR. They wonder if we can do everything in Rel-18, and they think some discussion is needed on the details.

* [AT123][426][POS] BT AoA/AoD (Ericsson)

Scope: Discuss the proposal in R2-2308955; determine if the general change is agreeable, and if so, start discussion on the approach in the CR.

Intended outcome: Report to CB session in R2-2309108

Deadline: Wednesday 2023-08-23 2000 UTC

[R2-2309108](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2309108%20%5bAT123%5d%5b426%5d%5bPOS%5d%20BT%20AoA-AoD%20(Ericsson)-Summary.docx) [AT123][426][POS] BT AoA/AoD (Ericsson) Ericsson discussion Rel-18

Proposal 1 An agreed Bluetooth AoA/AoD enhancement can be based on

- extending the Bluetooth positioning method parts of the LPP Location Information procedure to support Bluetooth AoA

- extending the Bluetooth positioning method parts of the LPP Assistance data procedure (UEA and UEB) and of the LPP Location information procedure (UEA) to support Bluetooth AoD

Discussion:

Apple think it looks OK at a high level, but they wonder if this is the highest priority. Ericsson think there are interested companies and do not see a big impact compared to other topics.

Qualcomm generally agree with Apple; they are not against it but they are concerned about time. They also wonder about the justification, and they think checking the Bluetooth information requires some effort.

* Discussion can continue

## 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.

[R2-2308400](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2308400_(PRU%20in%20LPP).docx) On Positioning Reference Unit support in LPP Qualcomm Incorporated discussion

[R2-2308488](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2308488%20PRU.docx) On the Positioning Reference Units aspects Ericsson, vivo discussion Rel-18

* [AT123][419][POS] Location information type for PRUs (Ericsson)

Scope: Discuss the proposals in R2-2308400 and R2-2308488, gather company views, and work towards a conclusion.

Intended outcome: Report to CB session in R2-2309120

Deadline: Wednesday 2023-08-23 2000 UTC

[R2-2309120](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202308%20-%20RAN2_123,%20Toulouse\Extracts\R2-2309120.docx) [AT123][419][POS] Location information type for PRUs (Ericsson) Ericsson discussion Rel-18

Proposal 1 Solicit signalling by adding a location information type that enables LMF to configure a PRU device to report both a location estimate and positioning measurements is supported.

Discussion:

Qualcomm think the email discussion was not completely clear and the content did not fully match the proposal. In their view this is not a matter of solicited vs. unsolicited; the LMF asks the PRU for measurements in any case, and they think timestamping the measurements and the location to match each other can be done with existing LPP. In their view the issue is whether the PRU is moving, in which case it would need to provide its current position. They also think the semantics of the locationType are wrong for this, since it is not about UE-based and UE-assisted together.

Ericsson think there are different mechanisms and the network can know when a UE is moving; they do not think the PRU should report autonomously. They agree it is not about combining UE-based and UE-assisted.

Huawei think sending two LPP messages would be another solution, but it would create more overhead, so they see creating a new codepoint as reasonable.

Apple generally agree with Qualcomm, but they think even stage 2 impact may not be needed; the network/operator will know which UE is a PRU.

Ericsson understand that if we use two codepoints there will be two transactions.

OPPO also agree that the PRU is special and should report both location and measurements autonomously.

Intel agree with Ericsson and Huawei that the network normally controls what the UE should send to it. Samsung also agree, and they are concerned that an unknown location of a PRU can affect other UEs’ positioning.

vivo think the SA2 procedure indicated that the location can be obtained independently from the measurements, and the LMF may only want one or the other; they think there should be some indication that the LMF requests both of them.

Xiaomi think the LMF may not always know if the PRU is moving, so autonomous reporting makes sense.

OPPO wonder if the PRU is moving and only reports the measurement results, what the point is; it is not clear why the network would want this situation.

Qualcomm think the PRU is known to the LMF, including its location, and the LMF would need a new location at the time the measurements are made if the PRU is moving.

Ericsson see a relation to the WA about the LMF using periodic reporting to gather statistics on UE measurements; it is not obvious that a stationary UE will always report identical measurements, so judging the measurements is statistical. They see it as reasonable for the LMF to control how it collects these statistics.