3GPP TSG-RAN WG2 Meeting #115 electronic R2-2xxxxxx

Online, 16-27 August 2021

Source: Session Chair (MediaTek)

Title: Report from session on sidelink relay and positioning

# Status of At-Meeting Email Discussions

This subclause is not an Agenda Item. It contains a running summary of the email discussions assigned to take place during the meeting weeks. This section will be moved to an appendix in the final version of the report.

* [AT115-e][600][POS][Relay] Organisational Nathan – Positioning/Relay (MediaTek)

Scope: Organisational discussions and announcements, as needed throughout the meeting weeks

Intended outcome: Well-informed participants

Deadline: Friday 2021-08-27 1000 UTC

* [AT115-e][601][POS] AI 4.4 Positioning corrections Rel-15 and earlier (Lenovo)

Scope: Handle the CRs in the following tdocs and determine conclusions:

* R2-2107261/R2-2107262
* R2-2107784
* R2-2107785/R2-2107786
  + Note: R2-2107785 and R2-2107786 were submitted under AI 5.5 and relate to TS 37.355, but are functionally shadows of R2-2107784

Intended outcome: Agreed CRs (without comeback), report in R2-2108931

Deadline: Tuesday 2021-08-24 0800 UTC

* [AT115-e][602][POS] AI 5.5 Positioning corrections (Huawei)

Scope: Handle the CRs in the following tdocs and determine conclusions:

* R2-2107329/R2-2107330
* R2-2108407

Intended outcome: Agreed CRs (without comeback), report in R2-2108932

Deadline: Tuesday 2021-08-24 0800 UTC

* [AT115-e][603][POS] AI 7.5 LTE Positioning and Rel-16 stage 2 CRs (Qualcomm)

Scope:

* Handle the CR in R2-2107959 and determine conclusion.
* Handle the CR in R2-2107333 and determine conclusion
* Handle the CR in R2-2107958 and determine conclusion

Intended outcome: Agreed CRs (without comebacks), report in R2-2108933

Deadline: Tuesday 2021-08-24 0800 UTC

* [AT115-e][604][Relay] PC5 and SRB0 adaptation layer (OPPO)

Scope:

* Discuss the proposals for a relaying adaptation layer on PC5 interface, and conclude on whether the adaptation layer should be supported in Rel-17.
  + Taking into account the potential for distinguishing between relayed and non-relayed traffic on PC5 hop
* Discuss the need for the adaptation layer on SRB0, and conclude on whether the adaptation layer should be used on SRB0.
  + Taking into account the potential for distinguishing between relayed and non-relayed traffic on Uu hop
* Discuss the assignment of the local remote UE ID (by the relay UE or the gNB)

Intended outcome: Report in R2-2108934; phase 2 report in R2-2108947

Deadline:

* Phase 1 (gauge initial support for the proposals, and see if downselection of options is possible): Wednesday 2021-08-18 2000 UTC
* Phase 2 (final conclusions): Tuesday 2021-08-24 2000 UTC
* [AT115-e][605][POS] LS to RAN3 on SRS-PosResource configuration (Samsung)

Scope: Draft an LS to RAN3 on the configuration issue from R2-2107960.

Intended outcome: Approved LS in R2-2108935

Deadline: Tuesday 2021-08-24 0600 UTC

* [AT115-e][606][POS] LPP need code guidelines for uplink (CATT)

Scope: Update the guidelines for need codes in 37.355 in accordance with the principle that need codes are sometimes used in the uplink, but in this case the requirements are not applicable (i.e. we do not specify the network behaviour).

Intended outcome: Agreed CR in R2-2108936

Deadline: Tuesday 2021-08-24 0600 UTC

* [AT115-e][607][POS] PRS-only TP flag and other identifiers (Huawei)

Scope: Discuss the possibility of signalling cell identifiers for the PRS-only TP, and the proposal for including a TP-ID, and draft an agreeable CR.

Intended outcome: Agreeable CR in R2-2108937

Deadline: Tuesday 2021-08-24 0600 UTC

* [AT115-e][608][Relay] Reply LS to R2-2106967 (CATT)

Scope: Discuss the questions from SA2 in R2-2106967 and generate a reply LS.

Intended outcome: Approvable LS in R2-2108938

Deadline: Tuesday 2021-08-24 2000 UTC

* [AT115-e][609][Relay] Service continuity procedures (MediaTek)

Scope: Progress the remaining proposals on service continuity with focus on the stage 2 procedures.

Intended outcome: Report with TP for 38.300, in R2-2108939

Deadline: Tuesday 2021-08-24 2000 UTC

* [AT115-e][610][POS] PRUs (CATT)

Scope: Discuss the LS in R2-2106920 and related contributions and reply to RAN1 (and include SA2 if potential impact to them is identified).

Intended outcome: Report in R2-2108940 and reply LS in R2-2108941

Deadline: Tuesday 2021-08-24 0800 UTC

* [AT115-e][611][POS] Reply LS on location estimates in local coordinates (Ericsson)

Scope: Draft a reply LS to R2-2106969, asking for clarification about the scope of the request (i.e. whether SA2 expect local coordinates to be provided to the LMF by the UE/gNB) and indicating that if the LMF does the translation to local coordinates we see no RAN2 impact and would apply no restriction as to methods.

Intended outcome: Approvable LS in R2-2108942

Deadline: Tuesday 2021-08-24 0800 UTC

* [AT115-e][612][POS] Reply LS to SA2 on scheduled location time (CATT)

Scope: Reply to the SA2 LS on scheduled location time, indicating RAN2 view on the latency benefit (to the extent agreement is possible) and understanding of RAN2 spec impact.

Intended outcome: Approvable LS in R2-2108943

Deadline: Tuesday 2021-08-24 0800 UTC

* [AT115-e][613][POS] Reply LS to RAN1 on response time granularity (Huawei)

Scope: Draft a response to the RAN1 LS on response time granularity indicating that RAN2 can signal the finer granularity. Capability discussion is not included.

Intended outcome: Approvable LS in R2-2108944

Deadline: Tuesday 2021-08-24 0800 UTC

* [AT115-e][614][POS] Reply LS to SA2 on capability storage (Qualcomm)

Scope: Reply to SA2 indicating that positioning capability is variable. We will give a finer-grained response e.g. which capabilities can vary only if consensus can be reached.

Intended outcome: Approvable LS in R2-2108945, report in R2-2109102

Deadline: Tuesday 2021-08-24 0800 UTC

* [AT115-e][615][POS] UL and UL+DL positioning in RRC\_INACTIVE (Huawei)

Scope: Evaluate the proposed UL and UL+DL positioning schemes and attempt to converge on an agreeable procedure.

Intended outcome: Report in R2-2108946

Deadline: Tuesday 2021-08-24 0800 UTC

* [AT115-e][616][Relay] Proposals from control plane summary (Xiaomi)

Scope: Briefly discuss P1/P4/P5 and P8/P9/P10 of R2-2108824 and attempt to reach consensus. Also confirm if P18 is agreeable.

Intended outcome: Report to comeback session, in R2-2108948

Deadline: Tuesday 2021-08-24 2000 UTC

* [AT115-e][617][Relay] Continuation of discussion on discovery (CATT)

Scope: Discuss the following questions on discovery:

* Whether the network can configure shared and dedicated pool for discovery simultaneously
* Resource allocation modes for discovery (P2/P3/P4/P5 of R2-2106994)
* Multiplexing in shared pool (P1 of R2-2107089)
* BSR for discovery transmission (P4/P5 of R2-2107089)

Intended outcome: Report to comeback session, in R2-2108949

Deadline: Tuesday 2021-08-24 2000 UTC

* [AT115-e][618][POS] Reply LS to RAN1 on on-demand PRS parameters (Intel)

Scope: Draft an LS replying to R2-2109061, indicating that we need to know the set of parameters that can be dynamically adjusted.

Intended outcome: Approved LS in R2-2108950

Deadline: Tuesday 2021-08-24 2000 UTC

# 4 EUTRA corrections Rel-15 and earlier

See Appendix A for reference to Work items, work item codes and WIDs.

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

## 4.4 Positioning corrections Rel-15 and earlier

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

[R2-2107260](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107260_PosSI_scheduling_for_eMTC.doc) Further discussion on Positioning SI message scheduling for eMTC Lenovo, Motorola Mobility discussion Rel-15 LCS\_LTE\_acc\_enh-Core

[R2-2107261](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\36331_CR4691_(Rel-15)_R2-2107261_Corrections_PosSI_scheduling_eMTC.docx) Addition of scheduling restrictions of positioning SI messages for eMTC Lenovo, Motorola Mobility CR Rel-15 36.331 15.14.0 4691 - F LCS\_LTE\_acc\_enh-Core

[R2-2107262](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\36331_CR4692_(Rel-16)_R2-2107262_Corrections_PosSI_scheduling_eMTC.docx) Addition of scheduling restrictions of positioning SI messages for eMTC Lenovo, Motorola Mobility CR Rel-16 36.331 16.5.0 4692 - A LCS\_LTE\_acc\_enh-Core

[R2-2107784](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107784.docx) Correction on ProvideCapabilities and ProvideLocationInformation Samsung CR Rel-14 36.355 14.7.0 0258 - F TEI14

R2-2108931 (Report of [601]) Lenovo discussion

# 5 Rel-15 WI: New Radio (NR) Access Technology

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

Only essential corrections. Includes all R15 NR drops and architectures.

## 5.5 Positioning corrections

Corrections to both the stage 2 and stage 3 aspects related to positioning. Stage 2 CRs 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.

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

[R2-2106928](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2106928_R3-212802.docx) Reply LS on E-CID LTE measurement in Rel-15 measurements (R3-212802; contact: Huawei) RAN3 LS in Rel-15 NR\_pos-Core To:RAN2

[R2-2107329](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107329%20Correction%20to%20E-CID-R15.doc) Correction to E-CID-R15 Huawei, HiSilicon CR Rel-15 38.305 15.8.0 0063 2 F NR\_newRAT-Core R2-2105052

* Revised in R2-2108952

R2-2108952 Correction to E-CID-R15 Huawei, HiSilicon CR Rel-15 38.305 15.8.0 0063 3 F NR\_newRAT-Core R2-2105052

[R2-2107330](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107330%20Correction%20to%20E-CID-R16.doc) Correction to E-CID-R16 Huawei, HiSilicon CR Rel-16 38.305 16.5.0 0064 2 F NR\_newRAT-Core R2-2105053

* Revised in R2-2108953

R2-2108953 Correction to E-CID-R16 Huawei, HiSilicon CR Rel-16 38.305 16.5.0 0064 2 F NR\_newRAT-Core R2-2105053

R2-2108932 [AT115-e][602][POS] AI 5.5 Positioning corrections (Huawei) Huawei discussion Rel-16

[R2-2107785](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107785.docx) Correction on ProvideCapabilities and ProvideLocationInformation Samsung CR Rel-15 37.355 15.2.0 0316 - A TEI14

[R2-2107786](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107786.docx) Correction on ProvideCapabilities and ProvideLocationInformation Samsung CR Rel-16 37.355 16.5.0 0317 - A TEI14

[R2-2108407](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2108407%20release-15.docx) Correction for Roles of gNB and ng-eNB for positioning in release-15 Ericsson CR Rel-15 38.305 15.8.0 0079 - F NR\_newRAT-Core

* Revised in R2-2108954

R2-2108954 Correction for Roles of gNB and ng-eNB for positioning in release-15 Ericsson CR Rel-15 38.305 15.8.0 0079 1 F NR\_newRAT-Core

# 6 Rel-16 NR Work Items

Essential corrections. While high maintenance intensity is expected, Rel-16 corrections are treated separately per WI.

Tdoc Limitation: 25 tdocs in total for all sub agenda items, or the restriction for each sub-AI, whichever is more restrictive.

## 6.3 NR Positioning Support

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

(NR TEI16 Positioning)

Documents in this agenda item will be handled in a break out session

Tdoc Limitation: 6 tdocs, See also tdoc limitation for Agenda Item 6

### 6.3.1 General and Stage 2 corrections

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

This agenda item may use a summary document (decision to be made based on submitted tdocs).

[R2-2107331](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107331%20Correction%20to%20NRPPa%20PDU%20transfer%20for%20uplink%20positioning.doc) Correction to NRPPa PDU transfer for uplink positioning Huawei, HiSilicon CR Rel-16 38.305 16.5.0 0073 1 F NR\_pos-Core R2-2105055

Discussion:

Nokia think it is more of a RAN3 issue, and the procedure currently states it is for gathering data from the gNB, so we may not need to show the details within the gNB. They think it could be discussed in RAN3.

CATT understand the intention but have some detailed comments.

Apple agree with Nokia that it is a RAN3 issue. Ericsson also agree.

* Not agreed

[R2-2107333](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107333%20Correciton%20to%20NB-IoT%20positioning.doc) Correciton to NB-IoT positioning Huawei, HiSilicon CR Rel-16 38.305 16.5.0 0076 - F NR\_pos-Core

Discussion:

CATT wonder about the relationship between step 8 in the original procedure and the new section; they see that both of them mention the CP CIoT optimisation and are not sure if the split is needed. Huawei understand that the original section is specific to sending the measurement report in RRC\_CONNECTED and we need to cover the case of sending the report in RRC\_IDLE.

Qualcomm wonder why this is for NB-IoT only and not also eMTC. They agree with the intention of the CR but think it should be a separate section, not under NB-IoT.

* Email (merge into discussion [603])

[R2-2107334](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107334%20Correction%20to%2038.305%20on%20NG-RAN%20positioning%20operations.doc) Correction to 38.305 on NG-RAN positioning operations Huawei, HiSilicon CR Rel-16 38.305 16.5.0 0077 - F NR\_pos-Core

Discussion:

Ericsson think we could remove the concerned sentence altogether. Nokia agree.

Qualcomm think we have the same sentence in all subsections of 5.3, and it is correct in the other cases; only 5.3.4 is an exception because of the involvement of UE-associated signalling. They think we could have organised it differently, but given the structure we have, they would prefer to correct the sentence instead of removing it.

Ericsson and Nokia can accept the CR.

* Agreed

[R2-2107958](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107958%20Correction%20on%20user-plane%20positioning%20support%20by%20SUPL_NR_final.docx) Correction on user-plane positioning support by SUPL Samsung, Qualcomm Incorporated CR Rel-16 38.305 16.5.0 0078 - F NR\_pos-Core

Discussion:

CATT are not sure about the ASN.1 part (extension marker in the first modified line).

* Email (merge into discussion [603])

[R2-2108410](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2108410%20stage%202%20PRS%20Only%20TP.docx) PRS only TP for NR Ericsson CR Rel-16 38.305 16.5.0 0080 - F NR\_pos-Core

* Noted

### 6.3.2 RRC corrections

Including impact to 36.331, 38.331, and 38.306.

This agenda item may use a summary document (decision to be made based on submitted tdocs).

[R2-2107960](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107960%20Misalignment%20between%20RRC%20and%20NRPPa%20in%20SRS%20configuration_final.docx) Misalignment between RRC and NRPPa in SRS configuration Samsung discussion Rel-16

Proposal 1 RAN2 sends the LS to RAN3 to trigger the discussion on enabling the SRS-resource-level Spatial Relation Information/Periodicity configuration in NRPPa.

Discussion:

Ericsson agree that there is a misalignment and are OK to send an LS.

CATT also see the misalignment, but think it could be contribution-driven in RAN3.

Huawei agree with CATT that it could be discussed directly in RAN3; they actually have some doubt about the misalignment, because they understand that the LMF requests the configuration at the resource set granularity and the gNB sets the resource level configuration.

Qualcomm think it would be helpful for RAN2 to send an LS at least to ask for clarification; they recall that this issue was previously discussed in RAN3.

* LS to RAN3 to indicate that we have noticed the configurations are not aligned, and to ask if this was the intention.
* [AT115-e][605][POS] LS to RAN3 on SRS-PosResource configuration (Samsung)

Scope: Draft an LS to RAN3 on the configuration issue from R2-2107960.

Intended outcome: Approved LS in R2-2108935

Deadline: Tuesday 2021-08-24 0600 UTC

[R2-2107961](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107961%20Relation%20between%20pathlossReference%20and%20spatialRelationInfo_final.docx) Relation between pathlossReference and spatialRelationInfo Samsung discussion Rel-16

Proposal 1 RAN2 to have discussion on the relation between the pathlossReferenceRS-Pos and spatialRelationInfoPos fields that apply to a certain SRS-PosResource and how to clarify this.

Discussion:

vivo think the clarification is unnecessary and it can be handled in network implementation. Ericsson have the same view.

* Noted

### 6.3.3 LPP corrections

This agenda item may use a summary document (decision to be made based on submitted tdocs).

Summary document

[R2-2108808](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2108808%20Summary%20of%206_3_3%20REL-16%20LPP%20Corrections%20v2_clean.docx) Summary of agenda item 6.3.3 - REL-16 LPP Corrections Nokia, Nokia Shanghai Bell discussion Rel-16 NR\_pos-Core Late

Proposal 1: RAN2 is kindly requested to discuss and decide if the field bdsAdot-r16 in NavModel-BDS-KeplerianSet2-r16 IE correctly represents the value range for a 2s complement 25bit parameter.

Discussion:

Nokia indicate that a concern was expressed about the value range being correct, but they understand that offline checking has concluded that only the correction from the original CR is needed. CATT have the same understanding, and have also checked the ranges of the other parameters mentioned in email. Lenovo also agree.

* CR is agreed (R2-2107121)

Proposal 2: RAN2 to agree the CR in R2-2108363 containing changes to the need code for fields nr-SelectedDL-PRS-IndexListPerFreq, dl-SelectedPRS-ResourceSetIndexList, and dl-SelectedPRS-ResourceIndexList in IE NR-SelectedDL-PRS-IndexList and a correction of an incorrect IE name to NR-DL-PRS-AssistanceData.

* CR is agreed (R2-2108363)

Proposal 3: RAN2 is kindly requested to discuss and decide whether to relax the current guideline that the conditional and need tags are used in the downlink direction only or otherwise how to address the incorrect use of conditional tags and need codes in UL messages/IEs that are still present in the LPP specification.

Discussion:

Nokia clarify that we have one proposal to relax the restriction on the need codes, and one to remove the need codes on the timestamp IE.

Ericsson discussed with the RRC rapporteur and think it would be OK to relax the restriction, but we need to make the UE behaviour clear and avoid needing to specify the network behaviour. Especially with Need ON they have a concern that it should not be used to avoid specifying requirements on the NW, but they think conditional tags could be useful.

CATT would like simply to relax the restriction since it has less impact, and they think there are other cases of need codes in the uplink, but they could also accept checking the need codes individually.

vivo also prefer to follow the “downlink only” principle and avoid specifying network behaviour.

Huawei think this was previously discussed and at that time companies felt there was no issue; they wonder what has changed.

Lenovo think we can discuss if it makes sense to change the conditional codes, but for need codes in the uplink, they think the main concern is IEs that are used in both uplink and downlink; we need the need codes for the downlink case, but we could clarify that in such cases the need codes do not apply in the uplink.

Qualcomm think this has been in LPP since Rel-9 and has not caused problems, so they would prefer to change the guideline rather than touch all the field descriptions and risk creating issues in the spec or for implementation. They would be OK with a guideline that the need codes are not meaningful in the uplink direction.

Apple do not want to see large ASN.1 changes, but clarifying that need codes do not apply in the uplink is OK.

Ericsson found that the timestamp was the only IE where this was an issue, so they think we could handle it by fixing there, but can accept the guideline change.

* Modify the guideline to indicate that when need codes are used in the uplink, the associated requirements do not apply.
* [AT115-e][606][POS] LPP need code guidelines for uplink (CATT)

Scope: Update the guidelines for need codes in 37.355 in accordance with the principle that need codes are sometimes used in the uplink, but in this case the requirements are not applicable (i.e. we do not specify the network behaviour).

Intended outcome: Agreed CR in R2-2108936

Deadline: Tuesday 2021-08-24 0600 UTC

Proposal 4: RAN2 is kindly requested to first discuss and decide if a PRS-Only TP indication in DL-PRS assistance data is needed. If agreeable, RAN2 should also discuss if the addition of a new TP ID along with PRS-Only TP indication is needed. Other details in the CRs in R2-2107332 and R2-2108406 can be decided later once these two points are discussed and resolved.

Discussion:

No concerns expressed with adding the PRS-Only flag, although Nokia are not sure it is critical. Qualcomm think the UE should be able to know that it cannot find anything besides PRS from this TP, i.e. it should not search for SSB/MIB/SIB1, so they find it useful from the UE pov.

For the TP ID, Qualcomm have some doubts. They are also concerned about the other clarifications in the Huawei CR and think the UE should not be required to copy information from the assistance data into the measurement report.

Intel think based on the Qualcomm explanation, we may not need the bit because LPP is only attempting to indicate where the PRS should be found; the UE should not be taking normal cell re/selection actions based on the contents of LPP.

MediaTek see some value from the UE point of view in terms of knowing what not to expect from the TP.

Huawei think we have the flag in LTE for MBS, and the same situation applies here. For the contents of signalling, we agreed that the PCI/CGI was useful for identifying the PRS configuration, and they think it could be useful here for the UE to echo them in the uplink.

* Agree to have the PRS-only TP flag; other aspects can be discussed offline.
* [AT115-e][607][POS] PRS-only TP flag and other identifiers (Huawei)

Scope: Discuss the possibility of signalling cell identifiers for the PRS-only TP, and the proposal for including a TP-ID, and draft an agreeable CR.

Intended outcome: Agreeable CR in R2-2108937

Deadline: Tuesday 2021-08-24 0600 UTC

R2-2108937 Correction to PRS-only TP Huawei, HiSilicon, Ericsson CR Rel-16 37.355 16.5.0 0305 2 F NR\_pos-Core

* Revised in R2-2108955 due to tdoc clash

[R2-2108955](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2108955%20Correction%20to%20PRS-only%20TP.doc) Correction to PRS-only TP Huawei, HiSilicon, Ericsson CR Rel-16 37.355 16.5.0 0305 3 F NR\_pos-Core

Discussion:

Qualcomm think some comments were not included; they think the DL-PRS is in the wrong place in the definition, and on the cell IDs in the DL, there are “shall” requirements on the network.

Huawei have no strong view on these two points, but want to make sure the correct network behaviour is documented.

Nokia think the current text is somewhat from network perspective rather than UE behaviour.

* “DL-PRS” to be moved in the definition to before “for PRS-based”, and “shall not be included” to be replaced by “is not included”.
* Agreed with these changes as R2-2108956

[R2-2108951](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2108951%20Summary%20of%20%5b607%5d%5bPOS%5d%20PRS-only%20TP%20flag%20and%20other%20identifiers%20(Huawei).docx) [AT115-e][Offline-607][POS] PRS-only TP flag and other identifiers (Huawei) Huawei, HiSilicon discussion Rel-16 NR\_pos-Core

The following documents will not be individually treated online

[R2-2107121](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107121.docx) Correction for LPP assistance information ROHDE & SCHWARZ CR Rel-16 37.355 16.5.0 0312 - F NR\_pos-Core

* Agreed (but later rescinded, see below)
* After agreement, MCC found an error in the CR coversheet
* Revised in R2-2109047 to fix the coversheet

[R2-2109047](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2109047.docx) Correction for LPP assistance information ROHDE & SCHWARZ CR Rel-16 37.355 16.5.0 0312 1 F NR\_pos-Core

* Agreed

[R2-2107227](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107227%20Discussion%20on%20the%20presence%20tag%20for%20Uplink%20LPP%20message.docx) Discussion on the presence tag for Uplink LPP message CATT discussion Rel-16 NR\_pos-Core

[R2-2107228](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\37355_CR0313_(Rel-16)_R2-2107228.doc) Corrections on the conditional presence tag clarification for Uplink LPP message CATT CR Rel-16 37.355 16.5.0 0313 - A NR\_pos-Core

[R2-2107229](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\37355_CR0314_(Rel-15)_R2-2107229.doc) Corrections on the conditional presence tag clarification for Uplink LPP message CATT CR Rel-15 37.355 15.2.0 0314 - F NR\_pos-Core

R2-2107230 Miscellaneous correction on the description of RequestedMeasurements CATT CR Rel-16 37.355 16.5.0 0315 - F NR\_pos-Core Withdrawn

[R2-2107332](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107332%20Correction%20to%20PRS-only%20TP.doc) Correction to PRS-only TP Huawei, HiSilicon CR Rel-16 37.355 16.5.0 0305 1 F NR\_pos-Core R2-2105054

* Revised in R2-2108937 (in email discussion [607])

[R2-2108363](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2108363_(37355-g50%20Correction%20of%20Need%20Code).docx) Correction to the need code in NR-SelectedDL-PRS-IndexList Qualcomm Incorporated CR Rel-16 37.355 16.5.0 0318 - F NR\_pos-Core

* Agreed

[R2-2108404](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2108404%20Discussion%20Need%20Code.docx) on Need codes and PRS-only TP Ericsson discussion

[R2-2108405](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2108405%20CR%20Need%20code.docx) Correction of Need code for UE signalling of NR-TimeStamp Ericsson CR Rel-16 37.355 16.5.0 0319 - F NR\_pos-Core

[R2-2108406](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2108406%20Addition%20of%20PRS%20Only%20TP.docx) Addition of PRS only TP Ericsson CR Rel-16 37.355 16.5.0 0320 - B NR\_pos-Core

### 6.3.4 MAC corrections

# 7 Rel-16 EUTRA Work Items

Essential corrections

## 7.5 LTE Positioning

(NavIC, LTE TEI16 Positioning)

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

[R2-2107959](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107959%20Correction%20on%20user-plane%20positioning%20support%20by%20SUPL_LTE_final.docx) Correction on user-plane positioning support by SUPL Samsung, Qualcomm Incorporated CR Rel-16 36.305 16.3.0 0105 - F LCS\_LTE

# 8 Rel-17 NR Work Items

## 8.7 NR Sidelink relay

(NR\_SL\_Relay-Core; leading WG: RAN2; REL-17; WID: RP-211050)

Time budget: 2 TU

Tdoc Limitation: 7 tdocs

Email max expectation: 7 threads

### 8.7.1 Organizational

Incoming LSs, TS updates, rapporteur inputs. This AI is reserved for rapporteur and organizational inputs. Documents in this AI do not count towards the tdoc limitation.

The LS from SA2 in R2-2106967 (S2-2104932) that addresses a mix of sidelink relay and sidelink enhancement topics will initially be handled under this AI.

Work plan

[R2-2107192](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107192%20-%20Work%20planning%20for%20R17%20SL%20relay.docx) Work planning for R17 SL relay OPPO Work Plan Rel-17 NR\_SL\_relay-Core

* Noted

Incoming LSs other than R2-2106967

[R2-2106973](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2106973_S3-212204.doc) Reply LS on R17 Layer-2 SL Relay of UE ID exposure in paging mechanism (S3-212204; contact: Huawei) SA3 LS in Rel-17 NR\_SL\_relay-Core To:RAN2 Cc:SA2, CT1

* Noted

LS from SA2 and related documents

[R2-2106967](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2106967_S2-2104932.docx) LS on RAN dependency issues for 5G ProSe (S2-2104932; contact: CATT) SA2 LS in Rel-17 5G\_ProSe To:RAN2

OPPO note that Q1 covers both relay- and non-relay-related discovery, and in RAN2 we have no place to handle non-relay-related. Ericsson think we need to clarify in the reply that for us NR PC5 discovery only refers to relay. Samsung and Qualcomm agree with Ericsson.

* Noted
* [AT115-e][608][Relay] Reply LS to R2-2106967 (CATT)

Scope: Discuss the questions from SA2 in R2-2106967 and generate a reply LS.

Intended outcome: Approvable LS in R2-2108938

Deadline: Tuesday 2021-08-24 2000 UTC

[R2-2108938](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2108938.docx) Reply LS on RAN dependency issues for 5G ProSe CATT LS out Rel-17 NR\_SL\_relay-Core To:SA2

* Approved as R2-2109124

[R2-2107193](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107193%20-%20Discussion%20on%20RAN2%20impact%20from%20S2-2104932.docx) Discussion on RAN2 impact from S2-2104932 OPPO LS out Rel-17 NR\_SL\_relay-Core To:SA2 Cc:RAN1

[R2-2107755](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107755.docx) Discuss SA2 LS on RAN dependency issues for 5G ProSe vivo discussion

[R2-2108150](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2108150%20Draft%20LS%20reply%20on%20RAN%20dependency%20issues%20for%205G%20ProSe.doc) Draft LS reply on RAN dependency issues for 5G ProSe ZTE, Sanechips discussion Rel-17

[R2-2108675](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2108675%20-%20Draft%20reply%20LS%20on%20RAN%20dependency%20issues%20for%205G%20ProSe.docx) Draft Relay LS on RAN dependency issues for 5G ProSe Qualcomm Incorporated LS out Rel-17 NR\_SL\_relay-Core To:SA2, RAN1

Running CRs

[R2-2107043](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Docs\R2-2107043.zip) Stage 2 Running CR on Introduction of R17 SL Relay MediaTek Inc. draftCR Rel-16 38.300 16.6.0 B NR\_SL\_relay-Core

Chair understands this is the same content as endorsed last meeting. MediaTek confirm.

* Noted

[R2-2108194](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2108194-%20Running%20CR%20of%2038.304%20for%20SL%20relay.docx) Running CR of 38.304 for SL relay Ericsson (Rapporteur) draftCR Rel-17 38.304 16.5.0 B NR\_SL\_relay-Core

* Noted

[R2-2108627](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2108627.docx) RRC running CR for SL relay Huawei, HiSilicon draftCR Rel-17 38.331 16.5.0 B NR\_SL\_relay-Core

* Noted
* Running CRs in the above documents will be updated and endorsed in post-meeting discussions

### 8.7.2 L2 relay specific topics

No documents should be submitted to 8.7.2. Please submit to 8.7.2.x.

#### 8.7.2.1 Control plane procedures

Including connection management, SI delivery, paging, access control for remote UE. This agenda item will utilise a summary document.

Including outcome of [Post114-e][605][Relay] SI and paging forwarding (vivo)

Email discussion summary

[R2-2107756](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107756.docx) Summary of [Post114-e][605][Relay] SI and paging forwarding (vivo) vivo discussion

[Easy]

Proposal 4：[Easy] SIB1 forwarding is supported from L2 Relay UE to L2 Remote UE. FFS SIB1 forward only for the necessary fields in SIB1 or the entire SIB1.

Proposal 5：[Easy] SIB2/SIB3/SIB4/SIB5 forwarding is supported from Relay UE to Remote UE, with the baseline that the Remote UE can request and receive SIB2/SIB3/SIB4/SIB5 from Relay UE in on-demand manner. FFS whether relay UE can voluntarily forward SIB2/SIB3/SIB4/SIB5 to remote UE.

Proposal 6：[Easy] SIB6/SIB7/SIB8 forwarding is supported from L2 Relay UE to L2 Remote UE.

Proposal 7：[Easy] SIB9 forwarding is supported from L2 Relay UE to L2 Remote UE, with the baseline that the Remote UE can request and receive SIB9 from Relay UE in on-demand manner. FFS whether relay UE can voluntarily forward SIB9 to remote UE.

Proposal 8：[Easy] SIB10 forwarding is supported from L2 Relay UE to L2 Remote UE, with the baseline that the Remote UE can request and receive SIB10 from Relay UE in on-demand manner. FFS whether relay UE can voluntarily forward SIB10 to remote UE

Proposal 9：[Easy] SIB11 forwarding is supported from L2 Relay UE to L2 Remote UE, with the baseline that the Remote UE can request and receive SIB11 from Relay UE in on-demand manner. FFS whether relay UE can voluntarily forward SIB11 to remote UE.

Proposal 10：[Easy] SIBpos forwarding is supported from L2 Relay UE to L2 Remote UE, with the baseline that the Remote UE can request and receive SIBpos from Relay UE in on-demand manner. FFS whether relay UE can voluntarily forward SIBpos to remote UE.

Proposal 11：[Easy] SIB12 forwarding is supported from L2 Relay UE to L2 Remote UE, with the baseline that the Remote UE can request and receive SIB12 from Relay UE in on-demand manner.. FFS whether relay UE can voluntarily forward SIB12 to remote UE.

Proposal 17：[Easy] Short message forwarding is not supported from L2 Relay UE to L2 Remote UE with Solution 1 i.e., NOT to introduce Short message field in SCI similar to DCI format 1\_0 (see TS 38.212 [17], clause 7.3.1.2.1).

[Chair summary of these proposals]:

* SIB1-SIB12 and posSIBs can at least be requested/received from relay UE in an on-demand manner
* FFS whether relay UE can voluntarily forward the SIBs/posSIBs to remote UE
* Short message forwarding via introducing a short message field in SCI is not supported
* FFS if short message can be indicated by PC5-RRC.

Discussion:

Ericsson have a concern about several of the SIBs, e.g. the cell re/selection SIBs may not be useful if the remote UE is camping in a different cell. For the PWS SIBs, they think the remote UE should not be able to request them on-demand because it does not know when they are available. They also do not see that SIB9 is usable because the remote UE can go out of sync. In general they think we should make only the SIBs available that make sense for the remote UE to have.

Xiaomi understand that the remote UE is considered as being camped on the serving cell of the relay UE, so they think the SIBs should be available as if the UE were camped directly on the cell. They also think that the first FFS does not apply to SIB1.

Huawei think the proposals do not say that the remote UE is required to request the SIB, only that we would pass the request/response through the relay.

Qualcomm agree with Huawei and think the current wording is already a compromise reached in the email discussion. They also think we should consider that the remote UE may support additional functionality in a future release.

Ericsson think the posSIBs are not in scope of the WID. vivo think this is not right.

Agreement:

For any SIB that the remote UE requests in on-demand manner, the relay UE can forward the response (i.e. the relay UE does not filter). FFS which SIBs the remote UE could request.

FFS whether relay UE can voluntarily forward the SIBs/posSIBs to remote UE without a request.

Short message forwarding via introducing a short message field in SCI is not supported.

FFS if short message can be indicated by PC5-RRC.

[Cross WG]

Proposal 1：[Cross WG] [For discussion] RAN2 to decide whether L2 Remote UE can receive the system information via PC5 before PC5 connection establishment with L2 Relay UE.

Proposal 2：[Cross WG] [For discussion] If RAN2 decide that L2 Remote UE can receive the system information via PC5 before PC5 connection establishment with L2 Relay UE, RAN2 to further discuss which option(s) of the PC5 signalling is used to carry the system information from L2 Relay UE to L2 Remote UE:

- Option 1: Discovery message

- Option 2: Broadcast PC5 RRC message

Discussion:

Ericsson think we can discuss P1, and if we agree on it we then discuss if there is SA2 impact. They do not see the benefit of P1.

* Discussion to be continued (briefly) at next session
* Starting from the proposals on paging below

[For discussion]

SI forwarding:

Proposal 3：[For discussion] RAN2 to decide whether to support MIB or part of MIB forwarding from L2 Relay UE to L2 Remote UE.

Proposal 12：[For discussion] Discuss whether SIB13/SIB14 forwarding is supported from L2 Relay UE to L2 Remote UE, with the premise that the Remote UE can request and receive SIB13/SIB14 from Relay UE in on-demand manner.

Proposal 14：[For Discussion] For L2 U2N relay, direct reception of SI via Uu is supported for in-coverage Remote UE.

Paging monitoring/forwarding:

Proposal 15：[For discussion] When L2 Relay UE in RRC CONNECTED and L2 Remote UE(s) in RRC\_IDLE/RRC\_INACTIVE, the Relay UE can monitor PO of its PC5-RRC connected Remote UE(s) if the active DL BWP of Relay UE is configured with common CORESET and common search space.

Proposal 16：[For discussion] When L2 Relay UE in RRC CONNECTED and L2 Remote UE(s) in RRC\_IDLE/RRC\_INACTIVE, discuss whether to support that the Relay UE can receive paging message of the Remote UE(s) through dedicated RRC message.

Discussion:

Ericsson think the majority was very thin, and suggest as a compromise we could agree both P15 and P16 and let the network decide whether to configure the relay UE in a BWP with CSS. I.e. we would specify the signalling for P16 and it would be network implementation to decide whether to use it.

CATT think we should agree P15 and think the BWP switching issues can be solved by the gNB implementation, so we could remove the limitation at the end of P15. They see P16 as an optimisation.

Qualcomm think P15 is legacy behaviour and agree with Ericsson’s compromise proposal.

Lenovo think P15 is not exactly legacy behaviour because the RRC\_CONNECTED UE does not have to monitor paging. They support the proposal but think it has some impact. For P16, they think the network should know the CN identity of the target remote UE(s).

Agreements:

When L2 Relay UE in RRC CONNECTED and L2 Remote UE(s) in RRC\_IDLE/RRC\_INACTIVE, the Relay UE can monitor PO of its PC5-RRC connected Remote UE(s) if the active DL BWP of Relay UE is configured with common CORESET and common search space.

For L2 relay UE in RRC\_CONNECTED and L2 remote UE(s) in RRC\_IDLE/RRC\_INACTIVE, we specify signalling for delivery of the remote UE’s paging through dedicated RRC message. Network implementation decision whether to use it (or keep the relay UE on BWP with CSS). Can be revisited if a problem is found with network knowledge of which paging to forward.

Proposal 18：[For discussion] Discuss whether to support Short message forwarding from L2 Relay UE to L2 Remote UE with Solution 2 e.g., introduce PC5 RRC message to forward the systemInfoModification or etwsAndCmasIndication carried in the Short Message. FFS: Whether relay UE forwards updated SIBs of interest to a remote UE directly.

[Lower priority]

Proposal 13：[Lower priority] Postpone discussion on concept of Minimum SI for L2 Remote UE to after decision on whether the L2 Remote UE can receive the system information via PC5 before PC5 connection establishment.

Summary document

[R2-2108824](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2108824%20Summary%20of%208.7.2.1.docx) Summary of AI 8.7.2.1 Xiaomi Technology discussion Rel-17 NR\_SL\_relay-Core

[Easy to be agreed]

Proposal 2: Fixed/specified Uu RLC configuration for remote UE’s SRB1 message is not pursued.

Proposal 3: Uu RLC configuration for remote UE’s SRB1 message such as RRCResume and RRCReestablishment message could be (re-)configured by NW via dedicated signalling.

Proposal 6: During remote UE’s initial access, C-RNTI is included in the relevant RRC message, e.g. RRCSetup/RRCResume/RRCReestablishment.

Proposal 7 (modified): During remote UE’s path switch, C-RNTI of remote UE in target cell can be included in the relevant RRC message, e.g. RRCReconfiguration.

Proposal 11: INACTIVE relay UE doesn’t enter IDLE state upon receiving CN initiated paging

for remote UE.

Proposal 13 (modified): take the flow chart and step description in R2-2107044 as a baseline into 38.300 running CR. Comments can be taken in the review of the 38.300 CR.

Proposal 14: PC5-RRC message is used to deliver SI to remote UE after PC5 connection establishment. FFS whether to use new or existing PC5-RRC message.

Proposal 18: As baseline, Remote UE and relay UE performs connection establishment/resume independently, i.e. relay UE shall enter CONNECTED to be able to forward remote UE’s initial RRC messages.

Discussion:

LG have a concern with P7, because the WI scope limits to intra-cell cases and the target cell will be the same as the source cell. Huawei think it is intra-gNB and could be inter-cell within the gNB.

vivo have a concern on P6 because they do not see that the C-RNTI is needed for the remote UE. Chair understands that the network might expect a connected UE has a C-RNTI. Huawei think it is needed for the short MAC-I if the UE performs re-establishment, and inter-cell re-establishment needs to be supported. Lenovo think the C-RNTI will be used for indirect-to-direct path switch.

Nokia would like to clarify P13; they want to make sure we will review it in the stage 2 CR.

Ericsson think P2 does not need to be taken explicitly. Xiaomi clarify that there were three options proposed and there seems some benefit to limit the options we consider in the future.

vivo have a security concern about adding the C-RNTI in the RRC signalling. Qualcomm point out that C-RNTI is included in MAC CE without security protection.

MediaTek wonder if the C-RNTI can be replaced with the local remote UE ID. vivo agree.

Xiaomi think companies want to have the C-RNTI to avoid impact to other procedures, and if we replace it with the local ID we may have a lot of changes.

ZTE think it is harmless to include the C-RNTI, but would like to clarify Huawei’s point about inter-cell re-establishment. They think this will not work because the UE does not know which cells belong to the same gNB. Huawei understand that from the UE pov, the SpCell changes to a new cell that may be intra-gNB. Huawei think the UE can try to re-establish and the network can reject if it is not workable.

On MediaTek’s comments, Huawei think it may be possible also to use the local ID, but the C-RNTI is also needed.

Agreements:

Proposal 3: Uu RLC configuration for remote UE’s SRB1 message such as RRCResume and RRCReestablishment message could be (re-)configured by NW via dedicated signalling.

Proposal 6: During remote UE’s initial access, C-RNTI is included in the relevant RRC message, e.g. RRCSetup/RRCResume/RRCReestablishment.

Proposal 7 (modified): During remote UE’s path switch, C-RNTI of remote UE in target cell can be included in the relevant RRC message, e.g. RRCReconfiguration.

Proposal 11: INACTIVE relay UE doesn’t enter IDLE state upon receiving CN initiated paging

for remote UE.

Proposal 13 (modified): take the flow chart and step description in R2-2107044 as a baseline into 38.300 running CR. Comments can be taken in the review of the 38.300 CR.

Proposal 14: PC5-RRC message is used to deliver SI to remote UE after PC5 connection establishment. FFS whether to use new or existing PC5-RRC message.

[Discussion to be agreed]

RLC configurations of SRB0/SRB1:

Proposal 1: RAN2 to discuss which Uu RLC configuration is used for remote UE’s SRB0 message.

* Option 1, Fixed/specified.
* Option 2, Default,
* Option 3, NW configured.

Proposal 4: RAN2 to discuss whether default Uu RLC configuration for remote UE’s SRB1 message is supported.

Proposal 5: RAN2 to discuss whether dedicated signalling is used for the PC5 RLC and Uu RLC configuration of remote UE SRB1 for RRCReconfigurationComplete in path switch to indirect path.

Sharing of ID/DRX information for paging forwarding:

Proposal 8: RAN2 to discuss whether IDLE/INACTIVE remote UE provides 5G-S-TMSI/I-RNTI to IDLE/INACTIVE relay UE.

Proposal 9: RAN2 to discuss whether IDLE/INACTIVE Relay UE decodes received paging message to derive the 5G-S-TSMI/I-RNTI and forward the paging message accordingly.

Proposal 10: RAN2 to discuss whether IDLE/INACTIVE remote UE provides its Uu DRX cycle T to IDLE/INACTIVE relay UE.

* [AT115-e][616][Relay] Proposals from control plane summary (Xiaomi)

Scope: Briefly discuss P1/P4/P5 and P8/P9/P10 of R2-2108824 and attempt to reach consensus. Also confirm if P18 is agreeable.

Intended outcome: Report to comeback session, in R2-2108948

Deadline: Tuesday 2021-08-24 2000 UTC

SI forwarding signalling:

Proposal 15: RAN2 to discuss which cast type is used for the PC5-RRC message delivering SI.

RNAU and TAU:

Proposal 16: In coverage remote UE should performs TAU/RNAU based on Relay UE’s serving cell information after it is PC5-connected with Relay UE.

P17a: After PC5-RRC establishment, OOC remote UE performs RNAU/TAU based on relay UE’s serving cell information.

P17b: After PC5-RRC establishment, RAN2 to discuss whether relay UE could perform RNAU/TAU on behalf of OOC remote UE.

Control of access procedure:

Proposal 20: RAN2 to discuss whether relay UE indicates remote UE if relay UE’s RRC connection establishment/resume is rejected. FFS relay UE sends indication upon other access failure, e.g. UAC check failure.

Proposal 21: RAN2 to discuss whether relay UE sends wait time to remote UE and the remote UE’s behaviour during wait time.

Proposal 22: RAN2 discuss how to handle T300 timer between remote UE and gNB, considering different RRC states of the relay UE.

RLF handling:

Proposal 23: RAN2 to discuss whether relay UE could inform Uu RLF to remote UE via PC5 RRC message.

Proposal 24: RAN2 to discuss whether relay UE could choose not to release remote UE after Uu RLF in certain condition, e.g. relay UE selects the same cell to perform RRC re-establishment.

HO handling:

Proposal 25: RAN2 to discuss when to release remote UE upon relay UE’s legacy or CHO handover.

* Option 1: upon handover initiation,
* Option 2: upon handover completion.

Proposal 26: RAN2 to discuss when to release remote UE during relay UE’s DAPS handover.

[Low priority]

Proposal 12: RAN2 to discuss whether PO monitoring reduction for relay UE is considered in R17.

Proposal 19: Relay UE should inform gNB upon new connection request from remote UE.

[R2-2108948](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2108948.docx) Report of [Offline-616] Xiaomi communications discussion

RLC configurations:

[Easy]Proposal 1: Uu RLC configuration for remote UE’s SRB0 message could be (re)configured by NW. FFS whether default configuration is supported. (17/20)

[Easy]Proposal 3 (modified): Dedicated signalling from gNB to relay UE is used for the PC5 RLC and Uu RLC configuration of remote UE SRB1 for RRCReconfigurationComplete in path switch to indirect path for RRC\_CONNECTED relay UE. FFS for RRC\_IDLE/RRC\_INACTIVE relay UE, if agreed to support. (20/20)

Paging:

[Easy]Proposal 4: RRC\_IDLE/RRC\_INACTIVE remote UE provides 5G-S-TMSI/I-RNTI to RRC\_IDLE/RRC\_INACTIVE relay UE. (17/20)

[Easy]Proposal 5: RRC\_IDLE/RRC\_INACTIVE Relay UE decodes received paging message to derive the 5G-S-TSMI/I-RNTI and forward the paging message accordingly. (17/20)

[Easy]Proposal 6: RRC\_IDLE/RRC\_INACTIVE remote UE provide its Uu DRX cycle information to RRC\_IDLE/RRC\_INACTIVE relay UE. FFS what is Uu DRX cycle information and how to provide. (18/20)

Connection establishment procedures:

[Easy]Proposal 7: As baseline, Remote UE and relay UE performs connection establishment/resume independently, i.e. relay UE shall enter CONNECTED to be able to forward remote UE’s initial RRC messages. (20/20)

Discussion:

Ericsson have a comment on P1: They think it makes sense to have a default configuration. On P3, they want to understand what the difference is for the path switch compared to he previous agreements on connection setup. Xiaomi clarify this aligns path switch to the previous agreement.

CATT have a question on P1 and wonder what the RLC mode between the relay UE and gNB is: TM or AM?

Apple think P3 should be clarified as applying to the relay UE.

[Discussion]Proposal 2: Default Uu RLC configuration for remote UE’s SRB1 message, such as RRCResume and RRCReestablishment, is supported. (15/20)

The following documents will not be individually treated

[R2-2106989](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2106989.docx) Control Plane Procedures of L2 Relay CATT discussion Rel-17 NR\_SL\_relay-Core

[R2-2106990](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2106990.docx) PO Monitoring for Relay UE in RRC\_CONNECTED and Remote UE in RRC\_IDLE/RRC\_INACTVE CATT discussion Rel-17 NR\_SL\_relay-Core

[R2-2107039](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107039-%20Discussion%20on%20Control%20Plane%20Aspects%20for%20L2%20Relay.docx) Discussion on Control Plane Aspects for L2 Relay OPPO discussion Rel-17 NR\_SL\_relay-Core

[R2-2107044](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107044%20Stage%202%20level%20procedure%20for%20Connection%20Establishment.docx) Stage 2 level procedure for Connection Establishment MediaTek Inc. discussion Rel-17

[R2-2107045](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107045%20Remote%20UE%20Paging%20handling%20for%20connected%20Relay%20UE.docx) Remote UE Paging handling for connected Relay UE MediaTek Inc. discussion Rel-17

[R2-2107103](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107103%20-%20Further%20discussion%20on%20RRC%20connection%20management%20of%20L2%20U2N%20relay.doc) Further discussion on RRC connection management of L2 U2N relay Qualcomm Incorporated discussion NR\_SL\_relay-Core

[R2-2107104](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107104%20-%20Further%20discussion%20on%20paging%20and%20SIB%20forwarding%20in%20L2%20U2N%20relay.doc) Further discussion on paging and SIB forwarding in L2 U2N relay Qualcomm Incorporated discussion NR\_SL\_relay-Core

[R2-2107176](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107176%20Remaining%20issues%20on%20RRC%20connection%20management.doc) Remaining issues on RRC connection management Samsung Electronics GmbH discussion

[R2-2107231](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107231%20Discussion%20on%20RRC%20connection%20management%20for%20L2%20sidelink%20relay.docx) Discussion on RRC connection management for L2 sidelink relay Huawei, HiSilicon discussion Rel-17 NR\_SL\_relay-Core

[R2-2107232](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107232%20SI%20forwarding%20and%20paging%20for%20L2%20sidelink%20relay.docx) SI forwarding and paging for L2 sidelink relay Huawei, HiSilicon discussion Rel-17 NR\_SL\_relay-Core

[R2-2107273](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107273%20(R17%20SL%20Relay%20SI_AI8721%20ConnEst%20Procedure).doc) Connection Establishment Procedure for L2 UE to NW Relays InterDigital discussion Rel-17 FS\_NR\_SL\_relay

[R2-2107274](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107274%20(R17%20SL%20Relay%20SI_AI8721%20Paging).doc) Paging Procedures for L2 UE to NW Relays InterDigital discussion Rel-17 FS\_NR\_SL\_relay

[R2-2107275](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107275%20(R17%20SL%20Relay%20SI_AI8721%20SI).doc) SI Forwarding for L2 UE to NW Relays InterDigital discussion Rel-17 FS\_NR\_SL\_relay

[R2-2107304](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107304.doc) Discussion on paging forwarding for a remote UE SHARP Corporation discussion NR\_SL\_relay-Core

[R2-2107306](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107306_SLRelay_ConnMgt_Intel.docx) Remaining issues of L2 Relay connection management Intel Corporation discussion Rel-17 NR\_SL\_relay-Core

[R2-2107367](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107367%20Discussion%20on%20control%20plane%20procedures%20for%20L2%20U2N%20relay.doc) Discussion on control plane procedures for L2 U2N relay Spreadtrum Communications discussion Rel-17

[R2-2107541](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107541%20relay%20CP.docx) Configuration of Uu Interface for Sidelink Relay Futurewei discussion Rel-17 NR\_SL\_relay-Core

[R2-2107622](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107622%20Discussion%20on%20SIB%20forwarding%20.doc) Remaining issues on SIB forwarding for IDLE/INACTIVE remote UE Apple discussion Rel-17 NR\_SL\_relay-Core

[R2-2107623](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107623%20Discussion%20on%20Unified%20Access%20Control%20in%20Relay%20UE.doc) Unified Access Control on Relay UE Apple discussion Rel-17 NR\_SL\_relay-Core

[R2-2107625](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107625%20Discussion%20on%20RNA%20Update%20procedures%20in%20L2%20UE-to-NW%20Relay.doc) RNA Update via L2 UE-to-NW relay Apple discussion Rel-17 NR\_SL\_relay-Core

[R2-2107708](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107708%20SI%20message%20forwarding%20in%20L2%20U2N%20relay.doc) SI message forwarding in L2 U2N relay Samsung discussion Rel-17 NR\_SL\_relay-Core

[R2-2107709](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107709%20Paging%20delivery%20via%20L2%20Relay%20in%20RRC_CONNECTED.doc) Paging delivery via L2 Relay in RRC\_CONNECTED Samsung discussion Rel-17 NR\_SL\_relay-Core

[R2-2107757](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107757.docx) Way forward for L2 U2N Remote UE SRB0 SRB1 configuration vivo discussion

[R2-2107966](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107966%20Relay%20Discussion%20on%20SI%20and%20paging%20delivery.doc) Discussion on SI and paging delivery Xiaomi communications discussion

[R2-2107967](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107967%20Relay%20Connection%20control.doc) Discussion on connection control Xiaomi communications discussion

[R2-2108007](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2108007%20SI%20acquisition,%20CN%20Registration%20and%20RNAU.doc) SI acquisition, CN Registration and RNAU Lenovo Mobile Com. Technology discussion Rel-17 NR\_SL\_relay-Core

[R2-2108008](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2108008%20Monitoring%20Paging%20by%20a%20U2N%20Relay.doc) Monitoring Paging by a U2N Relay Lenovo Mobile Com. Technology discussion NR\_SL\_relay-Core

[R2-2108060](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2108060.doc) L2 relay control plane procedures Sony discussion Rel-17 NR\_SL\_relay-Core

[R2-2108145](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2108145%20Consideration%20on%20the%20connection%20management%20of%20SL%20relay.doc) Consideration on the connection management of SL relay ZTE, Sanechips discussion Rel-17

[R2-2108146](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2108146%20Consideration%20on%20the%20system%20information%20acquisition%20and%20paging%20in%20SL%20relay.doc) Consideration on the system information acquisition and paging in SL relay ZTE, Sanechips discussion Rel-17

[R2-2108153](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2108153-%20Control%20plane%20procedure%20-%20SIB%20delivery%20&%20paging.docx) SIB Delivery & Paging for Remote UE LG Electronics Inc. discussion Rel-17

[R2-2108154](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2108154-Control%20plane%20procedure%20-%20Connection%20establishment.docx) Connection Establishment LG Electronics Inc. discussion Rel-17

[R2-2108156](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2108156-Remote%20UE%20operation%20when%20Relay%20UE%20performs%20HO.docx) Relay reselection when Relay UE performs HO LG Electronics Inc. discussion Rel-17

[R2-2108192](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2108192-%20Discussion%20on%20paging%20and%20SIB%20handling%20for%20L2%20sidelink%20relay.docx) Discussion on paging and SIB handling for L2 sidelink relay Ericsson discussion Rel-17 NR\_SL\_relay-Core

[R2-2108195](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2108195-%20Discussion%20on%20RRC%20connection%20management%20procedures%20for%20L2%20SL%20relay.docx) Discussion on RRC connection management procedures for L2 SL relay Ericsson discussion Rel-17 NR\_SL\_relay-Core

[R2-2108414](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2108414-Discussion%20on%20SI%20and%20paging%20forwarding.doc) Discussion on SI and paging forwarding ETRI discussion Rel-17 NR\_SL\_relay-Core

[R2-2108458](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2108458%20Discussion%20on%20RRC%20connection%20establishment%20of%20remote%20UE%20in%20L2%20U2N%20relay.docx) Discussion on RRC connection establishment of remote UE in L2 U2N relay Nokia, Nokia Shanghai Bell discussion NR\_SL\_relay-Core

[R2-2108462](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2108462%20Support%20of%20idle%20mode%20mobility%20for%20remote-UE%20in%20SL%20U2N%20relay.docx) Support of idle mode mobility for remote-UE in SL UE-to-Nwk relay Nokia, Nokia Shanghai Bell discussion Rel-17 NR\_SL\_relay-Core R2-2103310

[R2-2108510](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2108510%20Control%20plane%20procedure.docx) Control plane procedure CMCC discussion Rel-17 NR\_SL\_relay-Core

[R2-2108734](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2108734_SLRelay_SI_Intel.docx) Leftover issues for SI delivery in L2 Relay Intel Corporation discussion Rel-17 NR\_SL\_relay-Core

[R2-2108820](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2108820%20Discussion%20on%20SI%20reception%20before%20establishing%20PC5-RRC%20connection.docx) Discussion on SI reception before establishing PC5-RRC connection MediaTek Inc. discussion Rel-17 NR\_SL\_relay-Core

#### 8.7.2.2 Service continuity

Service continuity between Uu and relay paths, limited to intra-gNB cases. This agenda item will utilise a summary document.

Remaining proposals from RAN2#114-e

[R2-2107710](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107710%20Remaining%20easy%20proposals%20in%20outcome%20of%20%5bAT114-e%5d%5b605%5d%5bRelay%5d.doc) Remaining easy proposals in outcome of [AT114-e][605][Relay] Samsung(email discussion rapporteur) discussion Rel-17 NR\_SL\_relay-Core

Topics to be postponed or handled elsewhere:

Agreements:

Proposal 4 (easy) (18/19): CHO-like path switch procedure for Remote UE can be studied after the baseline design is finalized.

Proposal 5 (easy): The handling of RRC\_CONNECTED Remote UE’s mobility due to SL RLF or Uu RLF notified by Relay UE can be discussed in CP agenda item.

Measurement events:

Agreement:

Proposal 7 (easy)(modified): New measurement events for the remote UE can be defined to compare SL relay link measurement with a threshold and/or to compare SL relay link measurement with threshold A and Uu link measurement with threshold B.

Discussion:

Ericsson wonder if these are reported by the remote UE or the relay UE. Chair understood it was the remote UE. Samsung confirm it is for the remote UE and the remote UE can measure Uu when in coverage for the switch to direct path.

Procedures for service continuity:

Agreements:

Proposal 17 (easy) (18/19): For indirect to direct path switch, ~~that~~ PC5 connection reconfiguration can be executed between Remote UE and Relay UE to release PC5 RLC for relaying.

Proposal 19 (easy) (16/19) (modified): For indirect to direct path switch, PC5 unicast link can be released after Remote UE and Relay UE receive RRC reconfiguration from gNB (if there are no non-relaying PC5 RLC channels on the same PC5 unicast link, i.e. dedicated relaying link). FFS details of inter-layer interaction.

Proposal 20 (easy): For indirect to direct path switch, layer 2 link release procedure as legacy can be used when Remote UE and Relay UE execute PC5 unicast link release procedure.

Proposal 26 (easy) (18/19): For indirect to direct path switch, the RRC Reconfiguration message for Relay UE is intended to release Uu and PC5 RLC configuration for relaying~~,~~ and bearer mapping configuration between PC5 RLC and Uu RLC.

NOTE 1: P17 was edited after agreement for clarity (deletion marked with strikeout). Checked in email discussion [AT115-e][600].

NOTE 2: P26 was edited after agreement for clarity (deletion marked with strikeout, insertion marked with underline). Checked in email discussion [AT115-e][600].

Discussion:

On P20, OPPO wonder if “PC5 unicast link release” means PC5-RRC or PC5-S. On P26, OPPO understand that this procedure will be triggered by network implementation and we would not specify the contents.

Samsung think P20 is related to P19 below and we should agree to P19 first. They intend that it is the PC5-S link release procedure (which anyway triggers PC5-RRC release). vivo understand the difference is that we do not have an explicit procedure for PC5-RRC release, and the spec impact of this proposal would be that the PC5 AS layer indicates to upper layers so that they can release the PC5-S link.

vivo understand that these proposals were discussed in the context of a relaying-only PC5-RRC connection, and companies may have different understanding on whether we support shared connection between relaying and non-relaying traffic.

Futurewei think the release only applies to PC5 RLC channels for relaying. Samsung indicate P19/P20 are intended for the case that the connection is only used for relaying. Futurewei wonder if PC5-S is aware which PC5 RLC channels are for relaying and how to differentiate; they think we could do PC5-RRC release directly.

Ericsson wonder if the shared connection exists; they think this case adds spec complexity.

Kyocera think the modified form of P19 may be too restrictive and the release could take place after only the remote UE has received the reconfiguration. Futurewei think after receiving the reconfiguration message, the remote UE is not required to receive PC5 transmission on these channels any more, but to release the PC5 channels both UEs should have received the reconfiguration.

Huawei think P17 may be wrong and no PC5-RRC reconfiguration is needed. Chair understands that this is legacy operation as Rel-16. Samsung think the stage 3 details can be discussed later. OPPO understand that the PC5 link is under control of a PC5-RRC reconfiguration.

Order of steps in service continuity procedures (step numbers referring to Figure 4.5.4.1-1 of TR 38.836):

Proposal 15 (easy) (15/19): For indirect to direct path switch, RRC Reconfiguration message to Relay UE can be sent any time after step 3 based on gNB implementation, as in the Figure 4.5.4.1-1.

Proposal 16 (easy): For indirect to direct path switch, the timing of the PC5 unicast link release is up to UE implementation after step 3.

Proposal 18 (easy): For indirect to direct path switch, based on RRC Reconfiguration by gNB Remote UE and Relay UE can execute PC5 connection reconfiguration to release PC5 RLC for relaying and the timing of PC5 connection reconfiguration is up to UE implementation after step 3.

Proposal 22 (easy) (18/19): For indirect to direct path switch, step 8 can be executed in parallel or after step 5.

Proposal 28 (easy) (15/19): For direct to indirect path switch, the PC5 connection setup procedure is executed after step 3 if the connection has not been setup yet.

Data forwarding:

Proposal 21 (easy) (18/19): For indirect to direct path switch, Relay UE does not perform data forwarding back to gNB for Remote UE.

Message contents:

Proposal 25 (easy) (17/19): For indirect to direct path switch, the contents in RRC Reconfiguration message for Remote UE can be same as legacy NR RRC Reconfiguration with sync.

Proposal 30 (easy) (15/19): For direct to indirect path switch, additional indication from RRC\_CONNECTED Relay UE to gNB is not necessary to initiate Relay UE’s reconfiguration upon establishing unicast link with Remote UE.

Proposal 32 (easy) (18/19): For direct to indirect path switch, the contents in RRC Reconfiguration message for Relay UE can include at least Uu and PC5 RLC configuration for relaying, bearer mapping configuration.

Remaining proposals to be confirmed by email.

Summary document

[R2-2108196](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2108196-%20Feature%20summary%20for%20AI%208.7.2.2.docx) Feature summary of AI 8.7.2.2. Ericsson discussion Rel-17 NR\_SL\_relay-Core Late

Measurements:

Proposal 1 RAN2 to discuss whether S-measure criteria shall be used by the Remote UE.

Agreement:

Proposal 2 ~~RAN2 to confirm that t~~The Remote UE shall report only the Relay UE candidate(s) that fulfil the higher layer criteria. FFS ~~is~~ if also AS criteria should be taken into account.

NOTE: P2 was edited after agreement for clarity (deletions marked with strikeout, insertions marked with underline). Checked in email discussion [AT115-e][600].

Proposal 3 RAN2 to discuss whether the SL measurement quantity should be SL-RSRP for the case of path switch from indirect to direct path.

Proposal 4 RAN2 to discuss whether the SL measurement quantity should be SD-RSRP for the case of path switch from direct to indirect path.

Proposal 5 RAN2 to discuss if the Relay UE ID that is included in the measurement report is the Source L2 ID.

Proposal 6 RAN2 to discuss whether the Relay UE can be configured with measurements towards one particular Remote UE for purposes of path switch of that Remote UE.

RRC\_IDLE or RRC\_INACTIVE relay UE:

Proposal 7 RAN2 to discuss whether a Relay UE in RRC\_INACTIVE state can be selected by the gNB during path switch from direct to indirect link.

Proposal 8 RAN2 to discuss whether a Relay UE in RRC\_IDLE state can be selected by the gNB during path switch from direct to indirect link.

Proposal 9 RAN2 to discuss how a Relay UE in RRC\_INACTIVE/RRC\_IDLE transits to RRC\_CONNECTED upon path switch (e.g., via indication coming from the gNB or Remote UE).

T304:

Proposal 10 RAN2 to discuss on whether the legacy T304 can be reused for the path switch procedure.

Proposal 11 RAN2 to discuss the need of new timer(s) other than T304 for the path switch procedure and if yes, whether more than one new timer is needed (i.e., one for the direct to indirect path switch and another one for the indirect to direct path switch).

Contents of reconfiguration:

Proposal 12 RAN2 to discuss if the Relay UE ID included in RRC reconfiguration is C-RNTI and whether the Remote UE ID needs to be included in the RRC reconfiguration complete message.

Lossless delivery/PDCP status report:

Agreement:

Proposal 13 ~~RAN2 to confirm that t~~The DL/UL lossless delivery during the path switch is done according to the PDCP status report. FFS if there is spec impact.

NOTE: P13 was edited after agreement for clarity (deletion marked with strikeout, insertion marked with underline). Checked in email discussion [AT115-e][600].

Discussion:

OPPO think we could remove the FFS as they see little spec impact. Qualcomm think there is spec impact for the uplink direction; Ericsson agree.

CATT also wonder about spec impact.

* [AT115-e][609][Relay] Service continuity procedures (MediaTek)

Scope: Progress the remaining proposals on service continuity with focus on the stage 2 procedures.

Intended outcome: Report with TP for 38.300, in R2-2108939

Deadline: Tuesday 2021-08-24 2000 UTC

[R2-2108939](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2108939%20Report%20of%20%5bAT115-e%5d%5b609%5d%5bRelay%5d%20Service%20continuity%20procedures%20(MediaTek).docx) Email Report of [AT115-e][609][Relay] Service continuity procedures MediaTek Inc. discussion Rel-17

Easy proposals:

Timing and order of steps:

Proposal-1: Agree Proposal 15 within R2-2107710: for indirect to direct path switch, RRC Reconfiguration message to Relay UE can be sent any time after step 3 based on gNB implementation, as in the Figure 4.5.4.1-1.

Proposal-2: Agree reworded Proposal 16 within R2-2107710: for indirect to direct path switch, either Relay UE or Remote UE can initialize the PC5 unicast link release (PC5-S) (i.e. for Remote UE it should be after step 3; for Relay UE it should be after step 6), and upon the initiation of link release, the timing to execute link release is up to UE implementation.

Proposal-3: Agree reworded Proposal 18 within R2-2107710: for indirect to direct path switch, Remote UE can execute PC5 connection reconfiguration to release PC5 RLC for relaying upon reception of RRC Reconfiguration by gNB in Step 3, and Relay UE can execute PC5 connection reconfiguration to release PC5 RLC for relaying upon reception of RRC Reconfiguration by gNB in Step 6.

Proposal-4: Agree original Proposal 22 within R2-2107710: for indirect to direct path switch, step 8 can be executed in parallel or after step 5.

Proposal-5: Agree reworded Proposal 18 within R2-2107710: for direct to indirect path switch, the PC5 connection setup procedure is executed upon reception of RRC Reconfiguration for path switch in step 3 if the PC5 connection has not been setup yet. FFS for shared PC5 link between relay service and non-relay service.

Discussion:

ZTE have some doubt about P5 and would prefer to remove the FFS part; they are OK with the first part.

OPPO think instead of removing the FFS, we could remove the “if the PC5 connection has not been set up yet” condition. They understand that the point is for a relay-only PC5 connection.

LG think the FFS is needed because if the PC5 connection was previously set up as a shared link, we need to discuss what happens.

MediaTek think the majority view is that the FFS is needed.

Ericsson think we agreed that the assumption is that we don’t optimise things for shared connection, and they agree with the ZTE comment. They also think we did not leave an FFS for the release case.

* FFS if there is any special handling for shared PC5 link between relay service and non-relay service in the PC5 connection setup stage of the path switch.

Agreements:

Proposal-1: Agree Proposal 15 within R2-2107710: for indirect to direct path switch, RRC Reconfiguration message to Relay UE can be sent any time after step 3 based on gNB implementation, as in the Figure 4.5.4.1-1.

Proposal-2: Agree reworded Proposal 16 within R2-2107710: for indirect to direct path switch, either Relay UE or Remote UE can initiate the PC5 unicast link release (PC5-S) (i.e. for Remote UE it should be after step 3; for Relay UE it should be after step 6), and upon the initiation of link release, the timing to execute link release is up to UE implementation.

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Proposal-4: Agree original Proposal 22 within R2-2107710: for indirect to direct path switch, step 8 can be executed in parallel or after step 5.

Proposal-5: Agree reworded Proposal 18 within R2-2107710: for direct to indirect path switch, the PC5 connection setup procedure is executed upon reception of RRC Reconfiguration for path switch in step 3 if the PC5 connection has not been setup yet.

Data forwarding:

Proposal-6: Agree original Proposal 21 within R2-2107710: for indirect to direct path switch, Relay UE does not perform data forwarding back to gNB for Remote UE.

Reconfiguration message contents (remote UE):

Proposal-7: Agree original Proposal 25 within R2-2107710: for indirect to direct path switch, the contents in RRC Reconfiguration message for Remote UE can be same as legacy NR RRC Reconfiguration with sync.

Trigger for relay UE reconfiguration:

Proposal-8: Agree original Proposal 30 within R2-2107710: for direct to indirect path switch, additional indication from RRC\_CONNECTED Relay UE to gNB is not necessary to initiate Relay UE’s reconfiguration upon establishing unicast link with Remote UE.

Reconfiguration message contents (relay UE):

Proposal-9 (modified): Agree original Proposal 32 within R2-2107710: for direct to indirect path switch, the contents in RRC Reconfiguration message for Relay UE can include at least Uu and PC5 RLC configuration for relaying, and bearer mapping configuration.

S-measure:

Proposal-10: S-measure criteria is not used by the Remote UE for direct-indirect path switch.

Measurement quantities:

Proposal-11 (modified): As a baseline, SL-RSRP of the serving relay is used as the SL measurement quantity for the case of path switch from indirect to direct path.

Proposal-12: SD-RSRP is used as the SL measurement quantity for the case of path switch from direct to indirect path. FFS for shared PC5 link between relay service and non-relay service.

Proposa-12a: FFS whether/how the measurements in above Proposal-11/12 are configured based on Uu measurement and reporting framework

Discussion:

Ericsson think for P11 we could clarify that this is the SL-RSRP towards the serving relay.

OPPO have some concern for P12a, which was not discussed previously. vivo think we had similar agreements to P11 and P12 for idle/inactive mode, but this is for connected mode where the measurement framework can apply.

LG would like to add an FFS on P11 for the case that SL-RSRP is not available.

* FFS if P12 can be modified for the case of shared PC5 link between relay service and non-relay service.

Agreements:

Proposal-11 (modified): As a baseline, SL-RSRP of the serving relay is used as the SL measurement quantity for the case of path switch from indirect to direct path.

Proposal-12: SD-RSRP is used as the SL measurement quantity for the case of path switch from direct to indirect path.

Measurements:

Proposal-13: the Relay UE ID that is included in the measurement report is the Source L2 ID.

Proposal-14: the Relay UE can NOT be configured with measurements towards one particular Remote UE for purposes of path switch of that Remote UE.

T304:

Proposal-17: the legacy T304 is reused for path switch from indirect to direct path and a new timer (T304 alike) is introduced for path switch from direct to indirect path.

Stage 2 baseline:

Proposal-18: Use the procedure text and figures proposed at R2-2107046 for L2 Relay service continuity as the baseline to update the running stage 2 CR.

Kyocera wonder if this applies for relays in idle/inactive.

Proposals for discussion:

Proposal-15: RAN2 to discuss if Relay UE in RRC\_INACTIVE state can be selected by the gNB during path switch from direct to indirect link.

Proposal-16: RAN2 to discuss if Relay UE in RRC\_IDLE state can be selected by the gNB during path switch from direct to indirect link.

The following documents will not be individually treated

[R2-2106991](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2106991.docx) Service Continuity for L2 U2N Relay CATT discussion Rel-17 NR\_SL\_relay-Core

[R2-2107046](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107046%20Stage%202%20level%20procedure%20for%20Service%20Continuity.docx) Stage 2 level procedure for Service Continuity MediaTek Inc. discussion Rel-17

[R2-2107106](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107106%20-%20Service%20continuity%20of%20L2%20U2N%20relay.doc) Further discussion on Service continuity of L2 U2N relay Qualcomm Incorporated discussion NR\_SL\_relay-Core

[R2-2107196](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107196%20-%20Left%20issues%20on%20UP%20aspects%20for%20service%20continuity_v2.docx) Left issues on UP aspects for service continuity OPPO discussion Rel-17 NR\_SL\_relay-Core

[R2-2107213](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107213%20Discussion%20on%20CP%20of%20NR%20sidelink%20relay%20service%20continuity.docx) Discussion on CP of NR sidelink relay service continuity OPPO discussion Rel-17 NR\_SL\_relay-Core

[R2-2107276](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107276%20(R17%20SL%20Relay%20SI_AI8722%20Service_Continuity).doc) Service Continuity for L2 UE to NW Relays InterDigital discussion Rel-17 FS\_NR\_SL\_relay

[R2-2107309](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107309_SLRelay_ServiceContinuity_Intel.docx) Open aspects of Service continuity support for L2 U2N relaying Intel Corporation discussion Rel-17 NR\_SL\_relay-Core

[R2-2107452](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107452%20Remaining%20issues%20on%20service%20continuity%20in%20L2%20relaying.docx) Remaining Issues on Service Continuity in L2 relaying vivo discussion

[R2-2107540](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107540%20service%20continuity.docx) Open Issues in Switches between Direct and Indirect Paths Futurewei discussion Rel-17 NR\_SL\_relay-Core

[R2-2107621](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107621%20service%20continuity.doc) Discussion on service continuity for Layer 2 UE-to-NW relay Apple discussion Rel-17 NR\_SL\_relay-Core

[R2-2107711](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107711%20Remaining%20issues%20in%20Remote%20UE%20path%20switch%20procedures.doc) Remaining issues in Remote UE path switch procedures Samsung discussion Rel-17 NR\_SL\_relay-Core

[R2-2107887](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107887%20Path%20switching%20in%20L2%20U2N%20relay%20v1.2.doc) Path switching in L2 U2N relay case Lenovo, Motorola Mobility discussion Rel-17

[R2-2107888](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107888%20Service%20continuity%20with%20relay%20reselection%20v1.1.doc) Service continuity with relay reselection Lenovo, Motorola Mobility discussion Rel-17

[R2-2107949](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107949%20L2%20Relay%20handover%20to%20non-L2-Relay%20capable%20gNB.docx) L2 Relay handover to non-L2-Relay capable gNB Nokia, Nokia Shanghai Bell discussion Rel-17 NR\_SL\_relay-Core

[R2-2107965](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107965%20Relay%20Discussion%20on%20service%20continuity.doc) Discussion on service continuity Xiaomi communications discussion

[R2-2108061](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2108061.doc) Service continuity open issues in L2 NR sidelink rela Sony discussion Rel-17 NR\_SL\_relay-Core

[R2-2108147](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2108147%20Discussion%20on%20SL%20relay%20service%20continuty.doc) Discussion on the service continuity of SL relay ZTE, Sanechips discussion Rel-17

[R2-2108155](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2108155-Relay%20(re)selection%20for%20service%20continuity.docx) Relay (re)selection for service continuity LG Electronics Inc. discussion Rel-17

[R2-2108157](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2108157-Service%20continuity%20-%20measurement%20and%20report%20for%20path%20switching.docx) Measurement and report for path switching LG Electronics Inc. discussion Rel-17

[R2-2108193](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2108193-%20Discussion%20on%20service%20continuity%20for%20L2%20sidelink%20relay.docx) Discussion on service continuity for L2 sidelink relay Ericsson discussion Rel-17 NR\_SL\_relay-Core

[R2-2108282](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2108282.doc) Remaining issues on service continuity of SL relay China Telecommunications discussion

[R2-2108322](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2108322_service_continuity.doc) Open issues on service continuity for relaying Kyocera discussion Rel-17

[R2-2108464](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2108464%20Handover%20interruption%20time%20reduction%20using%20sidelink%20communication.docx) Handover interruption time reduction using sidelink communication Nokia, Nokia Shanghai Bell discussion NR\_SL\_relay-Core

[R2-2108513](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2108513%20Service%20continuity%20for%20L2%20relay.docx) Service continuity for L2 relay CMCC discussion Rel-17 NR\_SL\_relay-Core

[R2-2108622](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2108622%20Discussion%20on%20service%20continuity%20for%20L2%20UE%20to%20NW%20Relay.docx) Discussion on service continuity for L2 UE to NW Relay Huawei, HiSilicon discussion Rel-17 NR\_SL\_relay-Core

#### 8.7.2.3 Adaptation layer design

Including bearer mapping, remote UE identification, security aspects if any. This agenda item will utilise a summary document.

Email discussion checkpoint

[R2-2108934](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2108934%20-%20Summary%20of%20Phase-1%20for%20%5b604%5d.docx) [R2 AT115-e][604][Relay] Discussion on Adaptation Layer OPPO discussion Rel-17 NR\_SL\_relay-Core

[For easy agreement]

Agreements:

Proposal 5 Adaptation layer is not present over PC5 hop for SRB0 [16/19].

Proposal 6 Adaptation layer is not present over PC5 hop for BCCH and PCCH [15/15].

Proposal 9 (modified) Send LS to SA3 to notify the RAN2 agreement on local/temporary remote UE ID field in adaptation layer [19/19].

Discussion:

Ericsson think we should capture that the remote UE ID is local.

[For further discussion]

UE ID assignment and Uu adaptation layer for SRB0:

Proposal 8 Serving gNB of relay UE assigns the local/temp remote UE ID [13/20].

Proposal 1 RAN2 discuss for SRB0, adaptation layer is present over Uu hop for UL [12/20].

Proposal 2 For SRB0, adaptation layer is present over Uu hop for DL [13/20].

Discussion:

Apple understand that if we agree P1-P2, the first uplink message will carry the local ID, and if it is assigned by the gNB, it’s not clear how the relay UE can populate it.

InterDigital have the same concern as Apple; if we have the gNB-assigned ID, maybe we should have no adaptation layer for SRB0.

OPPO think we would need to have some signalling exchange, e.g. SUI, to get the local remote UE ID before the first message on SRB0, and this would also be useful to configure the Uu RLC channels.

Samsung think the SRB0 message can be identified by other means than the local remote UE ID, and the gNB can configure the ID afterwards; so they see this as a feasible combination.

Qualcomm also share Apple’s concern, but think it could be acceptable to use either the SUI (at the cost of some delay) or a reserved “new UE” value.

Xiaomi hear support for sending the ID In the first UL message, but want to avoid delaying to wait for extra signalling from the gNB. They could accept having a “temporary temporary ID” as suggested by Samsung and Qualcomm.

* Offline for further discussion in the continuation of discussion [604]; to focus on whether the majority views on P8/P1/P2 can be made compatible.

Adaptation layer over PC5:

Proposal 4 RAN2 discuss the presence of adaptation layer over PC5 hop, for both DL and UL transmission of Uu radio bearers other than SRB0, to select between 1) mandatory support and 2) not support.

Discussion:

Xiaomi think we should not be considering forward compatibility to a feature that may or may not be in a future release. Samsung agree.

Show of hands:

Option 1 (adaptation layer supported on PC5): 14

Option 2 (adaptation layer not supported on PC5): 9

Intel want to understand the technical reason for introducing the adaptation layer.

Samsung think the multihop argument is not in the scope of this release and the adaptation layer is not necessary. Qualcomm have the same concern and think we should have a stronger technical basis considering the workload.

Agreement:

Support the adaptation layer on PC5 for bearer mapping only.

Differentiation of relay and non-relay traffic:

Proposal 3 In order to differentiate relay and non-relay traffic over Uu hop, different LCID (i.e., relay and non-relay traffic carried via different LCH) is used as baseline [13/19].

Proposal 7 RAN2 discuss in order to differentiate relay and non-relay traffic over PC5 hop, from R2 perspective, different L2 ID [7/18] and/or different LCID [11/18] can be used. For the usage of different LCID, and it can be revisited based on SA2 decision on whether shared L2 ID for relay and non-relay traffic needs to be considered.

Discussion:

Xiaomi think it is not clear if the shared L2ID is supported and we may not need to agree these proposals for now.

ZTE think P3 works, but SA2 may assign different L2IDs and we could check with them.

Ericsson think we could postpone this issue, which also affects the control plane.

[R2-2108947](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2108947%20-%20Summary%20of%20Phase-2%20for%20%5b604%5d.docx) [R2 AT115-e][604][Relay] Discussion on Adaptation Layer OPPO discussion Rel-17 NR\_SL\_relay-Core

Proposal 8 Serving gNB of relay UE assigns the local/temp remote UE ID.

Proposal 1 (revised) For SRB0, adaptation layer is present over Uu hop for UL.

Proposal 2 For SRB0, adaptation layer is present over Uu hop for DL.

Recommendation: RAN2 removes “RAN2 discuss” in P1, and agree P2, P8 and the revised P1.

Discussion:

Xiaomi are concerned with P8 and want to understand if it is the ID for the relay UE to use in the uplink, or if it confirms that we need to have prior negotiation of the ID before the first uplink message. OPPO clarify the intention is that the adaptation layer header is there to carry the remote UE ID.

Huawei think we should clarify in P1/P2 that the adaptation layer includes the remote UE ID.

vivo think the addition in brackets about the temporary ID contradicts P8.

Agreements:

Proposal 8 Serving gNB of relay UE assigns the local/temp remote UE ID.

Proposal 1 (revised) For SRB0, adaptation layer is present over Uu hop for UL.

Proposal 2 For SRB0, adaptation layer is present over Uu hop for DL.

Summary document

[R2-2108484](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2108484%20Summary_of_8_7_2_3_v2.doc) Summary for Relay Adaptation Layer - AI 8.7.2.3 InterDigital France R&D, SAS discussion Rel-17 Late

[Prioritized to be agreed]

Agreements:

Proposal 1: RAN2 postpones discussions on configurability of Uu adaptation layer header and revisits it if time allows.

Proposal 8: A single adaptation layer entity for the Uu adaptation layer is configured in the relay UE .

Discussion:

On P8, Lenovo wonder if it also applies to the PC5 adaptation layer entity.

[Prioritized to be discussed]

Proposal 6: If RAN2 agree to support PC5 adaptation layer, discuss whether RLF indication can be sent using adaptation layer control PDU. FFS on the format.

Discussion:

Ericsson think the control PDU would be beneficial in reducing control signalling overhead and the spec effort is small.

vivo think the agreement to have bearer mapping only excludes this proposal. Huawei and Intel also agree.

InterDigital think based on the papers, the RLF indication can be either by control PDU or by PC5-RRC message. If we do not have the control PDU they think we could conclude that it is sent by PC5-RRC. Xiaomi support the use of PC5-RRC.

Huawei think PC5-S release may be enough and the PC5-RRC message may not be needed. Lenovo understand that the remote UE should be aware of the RLF event and may decide to keep the PC5 link even after receiving a PC5 release request.

Agreement:

Uu RLF is not indicated in adaptation layer.

Proposal 9: If RAN2 agree to support PC5 adaptation layer, discuss whether the PC5 adaptation and the Uu adaptation layer can share one single adaptation layer entity in the relay UE.

Discussion:

Samsung think having the same entity for adaptation layers on different interfaces would be odd. OPPO and MediaTek agree. Futurewei have a similar view.

vivo wonder if we need an agreement on this. From the implementation pov it does not need to be specified.

Agreement:

Uu adaptation layer and PC5 adaptation layer can be described as separate entities for specification purpose (we do not specify how they will be actually implemented).

Proposal 12: RAN2 discuss channel mapping configuration at the relay UE between Uu bearer ID, Uu RLC channel ID and PC5 RLC channel ID.

[Low Priority Agreements]

Proposal 10: Uu adaptation layer header format consists of one-bit DC field, RB ID, UE ID, and R bits (for byte alignment). FFS on the size of RB ID and UE ID.

Proposal 11: Relaying of MAC CEs by the SL Relay is not considered in this release.

[Related to email discussion [AT115-e][604]]

Proposal 2: RAN2 discuss whether adaptation layer header can be used for SRB0 transmission.

Proposal 3: RAN2 discuss whether the local UE ID is assigned by the relay UE or serving gNB of the relay UE.

Proposal 4: RAN2 send LS to SA3 with relevant agreements on UE ID, and asks if there are security concerns from SA3 perspective.

Proposal 5: RAN2 to discuss whether adaptation layer on PC5 can be supported.

Proposal 7: RAN2 to discuss the necessity of supporting traffic differentiation between relayed and non-relayed traffic using the adaptation layer on the Uu interface, and if not, how to manage the Uu LCID space.

The following documents will not be individually treated

[R2-2106992](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2106992.docx) Adaption Layer Design for L2 U2N Relay CATT discussion Rel-17 NR\_SL\_relay-Core

[R2-2107047](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107047%20Adaptation%20layer%20for%20PC5%20at%20L2%20UE-to-Network%20Relay.docx) Adaptation layer for PC5 at L2 UE-to-Network Relay MediaTek Inc., InterDigital discussion Rel-17

[R2-2107105](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107105%20-%20Further%20discussion%20adaptation%20layer%20of%20L2%20U2N%20relay.doc) Further discussion on adaptation layer of L2 U2N relay Qualcomm Incorporated discussion NR\_SL\_relay-Core

[R2-2107175](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107175%20Open%20issues%20with%20Adaptation%20layer%20design.doc) Open issues with Adaptation layer design Samsung Electronics GmbH discussion

[R2-2107194](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107194%20-%20Left%20issues%20on%20CP%20aspects%20for%20adaptation%20layer.docx) Left issues on CP aspects for adaptation layer OPPO discussion Rel-17 NR\_SL\_relay-Core

[R2-2107195](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107195%20-%20Left%20issues%20on%20UP%20aspects%20for%20adaptation%20layer.docx) Left issues on UP aspects for adaptation layer OPPO discussion Rel-17 NR\_SL\_relay-Core

[R2-2107277](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107277%20(R17%20SL%20Relay%20WI_AI8723%20Protocol%20Architectures)%20.doc) Discussion on L2 Relay Architecture InterDigital discussion Rel-17 FS\_NR\_SL\_relay

[R2-2107307](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107307_SLRelay_adaptation_layer_Intel.docx) L2 U2N relaying Adaptation layer design aspects Intel Corporation discussion Rel-17 NR\_SL\_relay-Core

[R2-2107356](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107356.doc) Remaining issues on adaptation layer for L2 relay Spreadtrum Communications discussion Rel-17

[R2-2107451](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107451%20Adaptation%20Layer%20for%20L2%20SL%20Relay.docx) Adaptation Layer for L2 SL Relay vivo discussion

[R2-2107470](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107470%20-UP%20aspects%20on%20Layer%202%20SL%20relay.docx) UP aspects on Layer 2 SL relay Ericsson discussion Rel-17 NR\_SL\_relay-Core

[R2-2107620](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107620%20PC5-Adaptation-header.doc) Discussion on adaptation header in PC5 link Apple discussion Rel-17 NR\_SL\_relay-Core

[R2-2107734](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107734%20adaptation%20layer.docx) Remaining Issues in Adaptation Layer Design Futurewei discussion Rel-17 NR\_SL\_relay-Core

[R2-2108148](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2108148%20Discussion%20on%20adaptation%20layer%20design.doc) Discussion on adaptation layer design ZTE, Sanechips discussion Rel-17

[R2-2108250](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2108250%20%20-%20SRB0_SRB1_Adaptation.docx) Sidelink Relay Uu RLC for Remote UE and Adaptation Layer Design Beijing Xiaomi Mobile Software discussion Rel-17

[R2-2108466](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2108466%20Discussion%20on%20Uu%20adaptation%20layer%20in%20L2%20UE-to-NW%20relay.docx) Discussion on Uu adaptation layer in L2 UE-to-NW relay Nokia, Nokia Shanghai Bell discussion NR\_SL\_relay-Core R2-2106054

[R2-2108511](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2108511%20Adaption%20layer%20for%20L2%20U2N%20relay.docx) Adaption layer for L2 U2N relay CMCC discussion Rel-17 NR\_SL\_relay-Core

[R2-2108623](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2108623%20Adaptation%20layer%20functionalities%20for%20L2%20U2N%20relay.docx) Adaptation layer functionalities for L2 U2N relay Huawei, HiSilicon discussion Rel-17 NR\_SL\_relay-Core

#### 8.7.2.4 QoS

Mechanisms for E2E QoS management. This AI will be treated on a time-available basis. This agenda item will utilise a summary document.

Summary document

[R2-2109018](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2109018%20-%20Summary%20on%208.7.2.4.doc) [Pre115-e][605][Relay] Summary of AI 8.7.2.4 QoS (Apple) Apple discussion Rel-17 NR\_SL\_relay-Core

[Prioritized to be agreed]

Proposal 7 (modified): [Easy] gNB should configure the [mode 2] remote UE with the PC5 PDB for PC5 hop of relay traffic.

Proposal 8 (modified): [Easy] gNB should configure the mode 2 relay UE with the PC5 PDB for PC5 hop of relay traffic.

Proposal 17: [Easy] In this release, for U2N relay, remote UE can be configured to use resource allocation mode 2 if relay connection has been setup. FFS for CG type 1.

Discussion:

Ericsson wonder why we need mode 1 in P8; they think we could remove the FFS part and configuring the mode 1 relay UE with the PDB would be an optimisation.

ZTE agree with Ericsson and think the PDB can be reflected in the LCP configuration. Samsung, Qualcomm, and OPPO also agree.

ZTE also think configured grants could be used in P17. Apple understand that this would be a lot of specification effort. ZTE think the UE assistance information with the SPS pattern is enough. Ericsson agree with Apple.

Huawei understand that mode 1 CG type 1 is workable with the resources configured by RRC and Uu HARQ disabled, so they would not like to exclude it now. Qualcomm think CG type 1 needs PUCCH to feed back the NACK, but they agree it may be disabled.

Agreements:

Proposal 7 (modified): [Easy] gNB should configure the [mode 2] L2 remote UE with the PC5 PDB for PC5 hop of relay traffic.

Proposal 8 (modified): [Easy] gNB should configure the mode 2 L2 relay UE with the PC5 PDB for PC5 hop of relay traffic.

Proposal 17: [Easy] In this release, for L2 U2N relay, remote UE can be configured to use resource allocation mode 2 if relay connection has been setup. FFS for CG type 1.

[Prioritized to be discussed]

Proposal 1. [Need discuss] Confirm the breakdown of E2E QoS over Uu and PC5 for L2 U2N relay can be gNB implementation

Discussion:

Apple think this is aligned with the SI conclusion. Ericsson agree with Apple and think we don’t need to re-confirm. They also think P2 is not needed.

Huawei support P1 and think P2 is not needed. Lenovo wonder what the spec impact of P1 will be.

Proposal 2: [Need Discuss] RAN2 discuss whether to send an LS to SA2 to give any guidance or let them know RAN2 decision for QoS breakdown for Layer 2 UE-to-NW relay.

Proposal 14. [Need Discuss] RAN2 to discuss whether to follow NR Rel-15 principle that gNB can’t configure to multiplex QoS flows of different PDU sessions target from remote/relay UE into a single Uu DRB in L2 U2N relay, or there is no need to enforce separation of Remote UE traffic and Relay UE’s own traffic in a single Uu bearer.

Proposal 15. [Need Discuss]PC5 RLC channels with different end-to-end QoS can be mapped to the same Uu RLC channel, which is up to gNB implementation.

Proposal 3: [Need Discuss]When gNB performing PDB split between Uu and PC5, non-standardized PDB/ parameters can be used.

Proposal 4: [Need Discuss]When gNB performing PER split between Uu and PC5, non-standardized PER parameters can be used.

Proposal 5: [Need discuss] gNB directly configures relay UE for PC5 QoS configuration via Uu RRC signalling. And gNB also directly configures remote UE for PC5 QoS configuration via Uu RRC signalling. FFS signaling details and when they are triggered.

Proposal 6: [Need Discuss] gNB should configure remote UE and relay UE about the PC5 Priority information for PC5 hop of relay traffic.

Proposal 9: [Need Discuss] gNB should configure the [mode 2] remote UE about the PC5 PER for PC5 hop of rely traffic.

Proposal 10: [Need Discuss] gNB should configure the mode 2 relay UE about the PC5 PER for PC5 hop of rely traffic. FFS mode 1 relay UE.

Proposal 12: [Need Discuss] RAN2 down-select the options for QoS configuration for [mode 2] remote UE for its operation on PC5 hop (UL).

Alt1: remote UE is configured per PC5 RLC bearer

Alt2: remote UE is configured per Uu QoS flow

Proposal 13: [Need Discuss] Regarding mode 2 Relay UE for its operation on PC5 hop (DL), PDB should be configured per PC5 RLC bearer.

Proposal 16 [Need Discuss] The existing SL measurement report and CBR measurement reports can be used by gNB to understand PC5 link conditions and determine QoS configuration. FFS whether enhancements on measurements reporting for PC5 link (e.g., on packet delay and loss rate ) are needed.

[Low Priority proposals]

Proposal 18: [Postpone] RAN2 to discuss whether to support relay UE handling of packet forwarding in a more granular (e.g., on per PDU or group of PDU basis) approach to meet QoS requirements or discarding them if QoS requirements cannot be met.

Proposal 19 [Postpone] RAN2 to discuss whether RAN2 should specify a new MAC CE for Sidelink SL-SCH to support the bit rate recommendation procedure between the U2N Relay UE and the Remote UE.

Proposal 20: [Postpone] RAN2 to discuss whether to support relay UE and gNB to exchange additional signalling (e.g., pre-emptive BSR or pre-emptive resource (re)selection) to reduce scheduling latency.

Proposal 21: [Postpone] RAN2 to discuss whether to support relay UE send a signaling to gNB for the purpose of flow control. FFS additional mechanisms.

Proposal 22: [Postpone] RAN2 to discuss whether PC5 transmissions for relaying should use a dedicated resource pool.

The following documents will not be individually treated

[R2-2106993](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2106993.docx) End-to-end QoS Management for L2 Sidelink Relay CATT discussion Rel-17 NR\_SL\_relay-Core

[R2-2107040](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107040%20-%20QoS%20management%20for%20L2%20U2N%20relay_V2.docx) Discussion on resource allocation and QoS management for L2 U2N relay OPPO discussion Rel-17 NR\_SL\_relay-Core

[R2-2107107](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107107%20-%20Discussion%20on%20E2E%20QoS%20enforcement%20in%20L2%20U2N%20relay.doc) Discussion on E2E QoS enforcement in L2 U2N relay Qualcomm Incorporated discussion NR\_SL\_relay-Core

[R2-2107278](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107278%20(R17%20SL%20Relay%20WI_AI8724%20QoS)%20.doc) Discussion on QoS for L2 UE to NW Relays InterDigital discussion Rel-17 FS\_NR\_SL\_relay

[R2-2107308](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107308_SLRelay_QoS_Intel.docx) E2E QoS management considerations for L2 U2N relaying Intel Corporation discussion Rel-17 NR\_SL\_relay-Core

[R2-2107471](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107471%20-%20Aspects%20for%20QoS%20management%20with%20SL%20relay.docx) Aspects for QoS management with SL relay Ericsson discussion Rel-17 NR\_SL\_relay-Core

[R2-2107497](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107497-%20E2E%20QoS%20Provisioning%20with%20L2%20Sidelink%20Relay.docx) E2E QoS Provisioning with L2 Sidelink Relay Fraunhofer IIS, Fraunhofer HHI discussion Rel-17

[R2-2107624](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107624%20QOS%20for%20Layer%202%20UE-to-NW%20relay.doc) QoS enhancements for UE-to-NW relay Apple discussion Rel-17 NR\_SL\_relay-Core

[R2-2107712](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107712%20QoS%20management%20aspects%20for%20L2%20U2N%20relay.doc) QoS management aspects for L2 U2N Relay Samsung discussion Rel-17 NR\_SL\_relay-Core

[R2-2107758](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107758.docx) Mechanisms for E2E QoS management vivo discussion

[R2-2107833](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107833_Considerations%20on%20voice%20and%20video%20support%20for%20Relays.docx) Considerations on voice and video support for Relays Philips International B.V., MediaTek, Vivo, FirstNet discussion Rel-17 NR\_SL\_relay-Core

[R2-2108149](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2108149%20Discussion%20on%20QoS%20of%20Sidelink%20relay.doc) Discussion on QoS of SL relay ZTE, Sanechips discussion Rel-17

[R2-2108512](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2108512%20Mechanisms%20for%20E2E%20QoS%20management.docx) Mechanisms for E2E QoS management CMCC discussion Rel-17 NR\_SL\_relay-Core

[R2-2108624](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2108624%20QoS%20management%20of%20L2%20U2N%20relay.docx) QoS management of L2 U2N relay Huawei, HiSilicon discussion Rel-17 NR\_SL\_relay-Core

[R2-2108821](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2108821%20On%20recommended%20bit%20rate.docx) On recommended bit rate MediaTek Inc. discussion Rel-17 NR\_SL\_relay-Core

### 8.7.3 L2/L3 common topics

For any remaining stage 3 issues related to discovery and (re)selection. No documents should be submitted to 8.7.3. Please submit to 8.7.3.x.

#### 8.7.3.1 Relay discovery

Re-using LTE discovery as baseline. This agenda item may utilise a summary document (decision to be made based on submitted tdocs).

[R2-2106994](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2106994.docx) Leftover Issues for Sidelink Discovery CATT discussion Rel-17 NR\_SL\_relay-Core

UE selection of resource pool:

Proposal 1: If both shared and dedicated resource pools are configured, UE can select only one of them to transmit the discovery message, and which resource pool is selected can be left to UE implementation.

Discussion:

LG are not sure what the benefit of configuring both pools is; they think the gNB should configure only one. Huawei agree.

Ericsson think for mode 1, it should be gNB decision which resource pool to use, but for mode 2 it can be left to UE implementation. Qualcomm agree.

OPPO think the dedicated pool should be prioritised for mode 2, and for mode 1 they agree it can be up to the gNB.

vivo wonder how the Rx UE can know which pool is selected by the Tx UE; they think it would have to monitor both pools, which would limit the power saving gain. So they see benefit in prioritising the dedicated pool. Huawei agree with vivo, but think we should first decide if we do allow the network to configure both; they would prefer that the network can only configure one. OPPO understand that the shared pool should be supported for the transmission of data, and the gNB may also configure discovery in the dedicated pool; they see power saving gains from this.

InterDigital think when we agreed to support both dedicated and shared pool, it was because both had benefits (power saving and resource efficiency, respectively), and if we force the network to configure only one, we don’t get the balance of these benefits. So they see that it would be beneficial to let the network configure both. Ericsson agree.

Huawei agree it is beneficial to support both dedicated and shared, but they do not see a benefit to enabling both at the same time.

Show of hands:

Shared pool for discovery/data and dedicated resource pool for discovery can be configured simultaneously: 11

Shared pool for discovery/data and dedicated resource pool for discovery cannot be configured simultaneously: 9

Agreements:

FFS if the network can configure shared and dedicated pool simultaneously.

For mode 1, if agreed that both shared and dedicated resource pools can be configured, it is up to gNB which one the UE should use to transmit discovery message.

For mode 2, if agreed that both shared and dedicated resource pools can be configured, downselect from the following options:

* Left to UE implementation
* Dedicated pool should be prioritised
* Shared pool should be prioritised

Resource allocation modes for discovery:

Proposal 2: For relay UE, when performing sidelink discovery, both mode 1 and mode 2 resource allocation modes can be supported, and which one will be used can be determined based on legacy Rel-16 resource allocation mode selection mechanism.

Proposal 3: For IC remote UE which has not been connected to network via a relay UE, both mode 1 and mode 2 resource allocation modes can be supported, and which one will be used can be determined based on legacy Rel-16 resource allocation mode selection mechanism.

Proposal 4: For IC remote UE which has already been connected to network via a relay UE, it is slightly prefers that only resource allocation mode 2 can be used to transmit the sidelink discovery message.

Proposal 5: For OOC remote UE, it is slightly prefers that only resource allocation mode 2 can be used to transmit the sidelink discovery message.

[Chair’s summary of the above proposals]

* Modes 1 and 2 can be used for discovery by IC relay or remote UE with direct Uu link, based on Rel-16 mode selection mechanism
* Mode 2 can be used for discovery by remote UE that is OOC or connected indirectly (FFS for CG type 1)
* [AT115-e][617][Relay] Continuation of discussion on discovery (CATT)

Scope: Discuss the following questions on discovery:

* Whether the network can configure shared and dedicated pool for discovery simultaneously
* Resource allocation modes for discovery (P2/P3/P4/P5 of R2-2106994)
* Multiplexing in shared pool (P1 of R2-2107089)
* BSR for discovery transmission (P4/P5 of R2-2107089)

Intended outcome: Report to comeback session, in R2-2108949

Deadline: Tuesday 2021-08-24 2000 UTC

RLC mode and discovery message segmentation:

Proposal 6: RLC AM is not used for SL-SRB4.

Proposal 7: Send LS to SA2 to check whether RLC TM is feasible for sidelink discovery message.

[R2-2108949](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2108949%20AT115-e%20617%20Continuation%20of%20discussion%20on%20discovery(CATT).docx) [AT115-e][617][Relay] Continuation of discussion on discovery (CATT) CATT discussion Rel-17 NR\_SL\_relay-Core

[Easy]:

Proposal 2: [18/18] For IC relay UE and IC remote UE which has not been connected to network via a relay UE, both resource allocation mode 1 and mode 2 can be supported.

Proposal 4: [19/19] For OOC remote UE which has not been connected to network via a relay UE, only resource allocation mode 2 can be used.

Discussion:

OPPO think for P2, we should clarify that this refers to relay and remote UEs in RRC\_CONNECTED; and for P4, they think this also applies to IC remote UE in RRC\_IDLE/RRC\_INACTIVE.

Huawei think the proposals just confirm Rel-16 principles and we do not need to re-confirm them explicitly; they agree with OPPO that we do not quite have the same wording as the legacy behaviour.

CATT think the original proposal for P2/P4 was to determine if we could reuse existing agreements for discovery, and agreement on them was unanimous in the discussion.

Apple agree that P2/P4 just reconfirm legacy behaviour and we don’t need to capture anything.

LG think Rel-16 principles can be reused for all cases.

Agreement:

Discovery for IC relay UE, for IC remote UE which has not been connected to network via a relay UE, and for OOC remote UE which has not been connected to network via a relay UE, relay discovery reuses the Rel-16 V2X resource allocation principles.

[Need further discussion]:

Proposal 3: [13/19] For UE (including IC remote UE and OOC remote UE) which has been connected to network via a relay UE, only resource allocation mode 2 can be used.

Proposal 1: [12/17] RAN2 confirmed that the network can configure shared and dedicated resource pools for discovery simultaneously.

Discussion:

Apple think we should be careful about adding FFS for the CG case.

OPPO think P3 is to reuse the agreement from the QoS session.

LG are not sure this is in scope for the WI since there is no objective for resource allocation enhancement.

OPPO think this is a bit different from the RAN1 resource allocation aspects. Apple agree with OPPO.

LG are concerned about opening the door to resource allocation enhancements.

Intel think the discussion is not to introduce new resource allocation mechanisms but to clarify the applicability.

Agreement:

Proposal 3: [13/19] For UE (including IC remote UE and OOC remote UE) which has been connected to network via a relay UE, only resource allocation mode 2 can be used.

[R2-2107089](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107089%20-%20Remaining%20issues%20on%20relay%20discovery.doc) Remaining issues on relay discovery Qualcomm Incorporated discussion NR\_SL\_relay-Core

Multiplexing in shared pool:

Proposal 1: RAN2 confirm that discovery and data can’t be multiplexed in same TB in shared pool

BSR for discovery transmission:

Proposal 4: For Mode 1 RA, no spec change on BSR is required. Instead, AMF to forward the discovery destination L2 ID to RAN via NGAP message, and gNB can differentiate whether the BSR is for discovery or SL data based on the SL destination L2 ID in SL-BSR

Proposal 5: If Proposal 4 is agreed, RAN2 send LS to SA2 to request introducing the signalling

[R2-2107212](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107212%20Discussion%20on%20remaining%20issue%20of%20relay%20discovery.docx) Discussion on remaining issue of relay discovery OPPO discussion Rel-17 NR\_SL\_relay-Core

[R2-2107279](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107279%20(R17%20SL%20Relay%20WI_AI8731%20Discovery).doc) Remaining Issues on Discovery InterDigital discussion Rel-17 FS\_NR\_SL\_relay

[R2-2107313](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107313.docx) Leftover aspects of Relay discovery Intel Corporation discussion Rel-17 NR\_SL\_relay-Core

[R2-2107468](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107468%20-%20Left%20issues%20for%20SL%20discovery.docx) Left issues for SL discovery Ericsson discussion Rel-17 NR\_SL\_relay-Core

[R2-2107713](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107713%20Resource%20allocation%20for%20SL%20relay%20discovery%20message.doc) Resource allocation for SL relay discovery message Samsung discussion Rel-17 NR\_SL\_relay-Core

[R2-2107759](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107759.docx) Remaining issues on Relay Discovery vivo discussion

[R2-2107889](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107889%20Relay%20Discovery%20in%20L2%20and%20L3%20relay%20case%20v1.1.doc) Relay Discovery for L2 and L3 relay Lenovo, Motorola Mobility discussion Rel-17

[R2-2107950](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107950%20Further%20Issues%20on%20discovery%20for%20NR%20Sidelink%20Relay.docx) Further issues on the discovery message for NR sidelink relay Nokia, Nokia Shanghai Bell discussion Rel-17 NR\_SL\_relay-Core

[R2-2108143](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2108143%20Further%20discussion%20on%20relay%20discovery.doc) Further discussion on Relay discovery ZTE, Sanechips discussion Rel-17

[R2-2108152](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2108152-Relay%20Discovery%20for%20stage%203.docx) Relay Discovery transmission for stage 3 LG Electronics Inc. discussion Rel-17

[R2-2108251](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2108251%20-%20SharedvDedicated%20Resource%20Pools.docx) Relay Discovery Resource Pool Utilisation Beijing Xiaomi Mobile Software discussion Rel-17

[R2-2108324](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2108324_discovery_coexistence.doc) Coexistence of discovery resource pools Kyocera discussion Rel-17

[R2-2108626](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2108626%20Remaining%20issue%20on%20relay%20discovery.docx) Remaining issue on relay discovery Huawei, HiSilicon discussion Rel-17 NR\_SL\_relay-Core

#### 8.7.3.2 Relay re/selection

Re-using LTE re/selection as baseline. This agenda item may utilise a summary document (decision to be made based on submitted tdocs).

[R2-2108144](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2108144%20Further%20discussion%20on%20relay%20selection.doc) Further discussion on Relay selection ZTE, Sanechips discussion Rel-17

Cell ID in discovery signalling:

Proposal 6: It is suggested to include NCI in the relay discovery message.

Discussion:

Ericsson would like to postpone this issue to next meeting to consider the overhead.

vivo think all companies supported this, and since the gNB ID is included in NCI it would be good for distinguishing intra- and inter-gNB cases.

MediaTek support the proposal. Intel are OK with the proposal and wonder if we should notify SA2.

Qualcomm note that the UE cannot distinguish the gNB ID unless RAN3 decide to enable it.

Working assumption: Include NCI in the relay discovery message.

Same cell reselection:

Proposal 1: If RRC\_Connected remote UE preforms relay re-selection due to Uu RLF with gNB, PC5 RLF with relay UE, or relay UE’s Uu RLF, it may prioritize the re-selection of a relay UE served by the same cell/gNB..

Proposal 2: If RRC\_Connected remote UE performs cell re-selection due to PC5 RLF or relay UE’s Uu RLF, it may prioritize the relay UE’s serving cell or cells controlled by the same gNB.

RLF notifications:

Proposal 3: It is suggested that relay UE send the Uu RLF notifications such as Uu RLF detected, Uu RLF recovered, Uu recovery failed, Uu recovery at new gNB, etc., which can be used by remote UE to determine whether and when the relay/cell re-selection should be performed.

Proposal 4: Relay UE only need to send RLF notification to RRC\_CONNECTED remote UE to trigger potential relay re-selection. For the RRC\_IDLE/INACTIVE remote UE, it may keep the PC5 connection with relay UE even if relay UE detects RLF and even enters RRC\_IDLE state.

Discussion:

LG think the relay UE should also notify the remote UE when starting handover.

Huawei think on P3, multiple notifications from the relay UE are not needed, considering signalling load, and that only one notification is enough. For P4, they think for simplicity the notification should be sent to all remote UEs connected to the relay UE, and they think the paging and SI information is important as well.

vivo also think one notification is enough. On P4, they understand that we agreed the remote UE \*may\* trigger reselection, so no harm to send the indication.

[R2-2106995](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2106995.docx) New Triggers for Relay Reselection CATT discussion Rel-17 NR\_SL\_relay-Core

[R2-2107102](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107102%20-%20Remaining%20issues%20on%20relay%20(re)selection.doc) Remaining issues on relay (re)selection Qualcomm Incorporated discussion NR\_SL\_relay-Core

[R2-2107305](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107305_SL%20Relay%20Reselection_Intel.docx) Leftover aspects of Relay reselection Intel Corporation discussion Rel-17

[R2-2107469](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107469%20-%20Aspects%20for%20SL%20relay%20selection%20and%20reselection.docx) Aspects for SL relay selection and reselection Ericsson discussion Rel-17 NR\_SL\_relay-Core

[R2-2107760](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107760.docx) Remaining issues on Relay (re)selection vivo discussion

[R2-2107872](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107872%20Discussion%20on%20sidelink%20relay%20reselection.doc) Discussion on sidelink relay reselection SHARP Corporation discussion

[R2-2107890](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107890%20Relay%20(re)selection%20in%20L2%20and%20L3%20relay%20case%20v1.1.doc) Relay (re)selection for L2 and L3 relay Lenovo, Motorola Mobility discussion Rel-17

[R2-2108252](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2108252%20-%20Cell%20ID%20L2%20Relay%20(Re)selection.docx) Use of Cell ID in Sidelink L2 Relay (Re)selection Beijing Xiaomi Mobile Software discussion Rel-17

[R2-2108467](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2108467%20Discussion%20on%20UE-to-Nwk%20Relay%20Enhancement%20for%20mobility%20operation.docx) Discussion on sidelink assisted mobility using UE-to-Nwk Relay Nokia, Nokia Shanghai Bell discussion

[R2-2108625](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2108625%20Discussion%20on%20relay%20reselection.docx) Discussion on relay reselection Huawei, HiSilicon discussion Rel-17 NR\_SL\_relay-Core

[R2-2108706](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2108706%20Remaining%20issues%20for%20L2%20U2N%20relay%20(re)selection.docx) Remaining issues for L2 U2N relay (re)selection MediaTek Inc. discussion Rel-17

## 8.11 NR positioning enhancements

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

Time budget: 2 TU

Tdoc Limitation: 7 tdocs

Email max expectation: 7 threads

### 8.11.1 Organizational

Rapporteur input. Incoming LS etc. This AI is reserved for rapporteur and organizational inputs; documents in this AI do not count towards the tdoc limitation.

Incoming LSs with RAN2 in Cc:

[R2-2106913](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2106913_R1-2106202.docx) LS on support of UL-AOA/ZOA assistance information signalling for NR positioning (R1-2106202; contact: Intel) RAN1 LS in Rel-17 NR\_pos\_enh-Core To:RAN3 Cc:RAN2

* Noted (per email discussion [AT115-e][600])

[R2-2106918](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2106918_R1-2106312.docx) Reply LS to SA2 on Scheduling Location in Advance (R1-2106312; contact: Qualcomm) RAN1 LS in Rel-17 NR\_pos\_enh To:SA2 Cc:RAN2, RAN3

* Noted (per email discussion [AT115-e][600])

Incoming LS on PRUs

[R2-2106920](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2106920_R1-2106326.docx) LS on Positioning Reference Units (PRUs) for enhancing positioning performance (R1-2106326; contact: CATT) RAN1 LS in Rel-17 NR\_pos\_enh To:RAN2, RAN3 Cc:SA2

Discussion:

ZTE think existing procedures in LPP can be reused for PRUs, and they think there are questions we could ask RAN1 for clarification: e.g. whether LMF can request location and measurements simultaneously. They would also like to understand what additional information CATT see as necessary in the response. CATT indicate we can try to determine if any additional information needs to be delivered to the UE to be positioned after the LMF collects the measurements. ZTE wonder what an example of such additional information would be. CATT think it is important to establish the whole picture.

Intel think we should discuss the contributions by email. OPPO agree and think the LS is not completely clear as to the type of the PRU device, how the PRU gets its known location, etc.

CATT understand that we should discuss the type of the PRU; how to manage and discover the PRUs; and the LPP impact.

Nokia wonder if RAN1 have definitively excluded spec impact for them or if they have not had time to look into the impact. CATT understand that RAN1 think there is no impact to them.

* Noted
* [AT115-e][610][POS] PRUs (CATT)

Scope: Discuss the LS in R2-2106920 and related contributions and reply to RAN1 (and include SA2 if potential impact to them is identified).

Intended outcome: Report in R2-2108940 and reply LS in R2-2108941

Deadline: Tuesday 2021-08-24 0800 UTC

R2-2108941 (LS from [610]) CATT LS out Rel-17 NR\_pos\_enh-Core To:RAN1

* Not provided (no consensus in email discussion to send)

[R2-2108940](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2108940%20Summary%20of%20%5bAT115-e%5d%5b610%5d%5bPOS%5d%20PRUs%20(CATT).docx) [AT115-e][610][POS] PRUs (CATT) CATT discussion Rel-17 NR\_pos\_enh-Core

PRUs Type aspect

Proposal 1 (modified): For purposes of RAN2 discussion, the PRU can be considered as UE with known location at least (16/17).

Proposal 2: RAN2 to further discuss if PRU can be considered as part of a gNB, i.e., TRPs (9/17).

Discussion:

Qualcomm think P1 can be more precise and say the PRU is considered as a UE with known location.

Huawei wonder if P2 is in RAN2 scope; they think it should be discussed in RAN3.

Ericsson doubt P1 and think starting with the terminology is not good practice. They do not see precedent for this concept in the WID and think it’s dangerous that we try to specify something we haven’t defined. They think the email discussion confirmed that the measurements needed from a PRU are similar to what we have from a UE, but think we should not move towards a definition.

Nokia see the potential benefit of the PRU concept and are not particular about the terminology; since the PRU has a known location and must be capable of performing measurements, and by analogy with RTK, they agree it can be seen as a UE. However, they think it has some TRP characteristics, which increases the complexity. They also agree that the PRU as gNB is somewhat outside RAN2 scope, but have a concern about supporting both.

OPPO agree to send an LS to RAN1 for more details, and on P1 they think we may need to ask RAN1 about the PRU type; they think it should not be defined in RAN2. They also wonder how the PRU gets its location, and if it does it by itself, they do not see the difference between a PRU and a UE, while if it does it by implementation-specific methods they do not see spec impact.

CATT understand the concern from OPPO, but think the capability of the PRU does not require behaviour as a commercial UE; the PRU should take some positioning capabilities from a UE, but it does not mean that a normal UE would support this functionality. They agree with Nokia that it is similar to an RTK reference station.

Intel think in the RAN1 LS, they clearly indicated what functionality should be supported by the PRU, but left to RAN2 if it would be modelled as a UE or a gNB/TRP, and we have to decide the functionality.

Ericsson think we do not know the full RAN1 background and we should try to capture what we can understand. They think there may be consensus that the PRU can be modelled as a UE with certain special capabilities. They also think “known” location is an abuse of terminology.

CATT point out RAN1 already mentioned “known location”.

Agreements:

Proposal 1 (modified): For purposes of RAN2 discussion, the PRU functionality as described in the RAN1 LS can be considered as UE with known location (to some degree of accuracy) at least (16/17).

PRU modelled as a gNB can be discussed in RAN3 (no RAN2 action).

Architecture within SA2 impact aspect

Proposal 3: RAN2 to further discuss the impact to SA2 online (9 yes vs 8 no).

RAN1 reply LS aspect

Proposal 8: RAN2 to further discuss whether need to confirm with RAN1 on whether support PRU to calculate the measurement corrections and report it to LMF (6/16).

Proposal 9: RAN2 to further discuss to confirm with RAN1 if it is valuable to provide the correction information from LMF to UE for UE-based positioning online (7/16).

Proposal 10: RAN2 will further discuss the questions/request to RAN1 and do not reply the LS now (10/15).

LPP impact aspect

\*Proposal 4: RAN2 to agree that the current LPP request/provide assistance data procedure can be reused for the assistance data information transfer between LMF and PRU (15/17).

Discussion:

Nokia think we will conclude this in the end, but this is the first time we touch the topic and they would like to ask RAN1 for more guidance on requirements.

Apple think the proposal is fine, but they are not sure that there would be any LPP impact.

Ericsson think this just says LPP supports the normal procedure towards a UE, and we don’t need to capture this explicitly.

Agreement:

RAN2 confirm that the PRU considered as a UE supports the normal LPP procedures for assistance data transfer and location information transfer.

Proposal 5: RAN2 can further discuss the SA2 independent solutions of PRU known location/antenna orientation information transfer between LMF and PRU(10/17).

Proposal 6: RAN2 to further discuss the candidate solution to support the PRU known location/antenna orientation information transfer between LMF and PRU:

‑ Solution 3: Reusing the current LPP request/provide location information message with enhancement to include PRU known location/PRU antenna orientation information (8/13).

\*Proposal 7: RAN2 to agree that the current request/provide location information message can be reused for the positioning measurement information transfer between LMF and PRU (15/17).

Incoming LS on local coordinates

[R2-2106969](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2106969_S2-2105124.docx) LS on determination of location estimates in local co-ordinates (S2-2105124; contact: Ericsson) SA2 LS in Rel-17 5G\_eLCS\_ph2 To:RAN1, RAN2, RAN3

Discussion:

Ericsson do not see spec impact to RAN2 so far.

Huawei do not understand why SA2 ask RAN2 this question, since the impact seems to be only to what the LMF returns, so they understand that it can be applicable for any method with no RAN impact. Ericsson agree with Huawei.

CATT also think there is no LPP impact.

Qualcomm think the LS is not quite clear, and in their view if we support this in RAN we have to provide the local coordinates to the LMF. If the only impact is to the LMF, it seems obvious there would be nothing for RAN, but since SA2 asked the question, Qualcomm wonder if we should support local coordinates in LPP, which would be significant impact.

* Noted
* [AT115-e][611][POS] Reply LS on location estimates in local coordinates (Ericsson)

Scope: Draft a reply LS to R2-2106969, asking for clarification about the scope of the request (i.e. whether SA2 expect local coordinates to be provided to the LMF by the UE/gNB) and indicating that if the LMF does the translation to local coordinates we see no RAN2 impact and would apply no restriction as to methods.

Intended outcome: Approvable LS in R2-2108942

Deadline: Tuesday 2021-08-24 0800 UTC

[R2-2108942](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2108942.docx) [Draft] Reply LS on determination of location estimates in local co-ordinates Ericsson LS out Rel-17 NR\_pos\_enh-Core To:SA2

* Approved as R2-2108957

Incoming LSs on latency enhancement topics

[R2-2106919](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2106919_R1-2106316.docx) LS on granularity of response time (R1-2106316; contact: Huawei) RAN1 LS in Rel-17 NR\_pos\_enh To:RAN2

* Noted

[R2-2106968](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2106968_S2-2105122.docx) Response LS on Scheduling Location in Advance to reduce Latency (S2-2105122; contact: CATT) SA2 LS in Rel-17 5G\_eLCS\_ph2 To:RAN2 Cc:RAN1, RAN3

* Noted

[R2-2106971](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Docs\R2-2106971.zip) LS on storage of UE Positioning Capabilities (S2-2105153; contact: Qualcomm) SA2 LS in Rel-17 5G\_eLCS\_ph2 To:RAN2 Cc:RAN3

* Noted

Draft replies

[R2-2107133](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107133%20Draft%20Response%20LS%20to%20SA2%20on%20the%20scheduled%20location%20time.docx) Draft Response LS to SA2 on the scheduled location time CATT LS out Rel-17 NR\_pos\_enh-Core To:SA2 Cc:RAN1, RAN3

[R2-2107144](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107144.docx) Draft Response LS to RAN1 on the Positioning Reference Units (PRUs) for positioning enhancement CATT LS out Rel-17 NR\_pos\_enh-Core To:RAN1 Cc:RAN3

[R2-2108401](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2108401%20local%20co-ordinates.docx) Local Co-ordinates support for Positioning methods Ericsson discussion

[R2-2108402](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2108402%20LS%20SA2%20local.docx) [Draft] Reply LS on determination of location estimates in local co-ordinates Ericsson LS out To:SA2 Cc:RAN1, RAN3

Running CR related topics

[R2-2107674](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107674%20Consideration%20on%20stage%202%20structure%20on%20RAT%20dependent%20positioning.docx) Consideration on stage 2 structure on RAT dependent positioning Intel Corporation discussion Rel-17 NR\_pos\_enh

* Noted (provided for information)
* CR to be progressed by post-meeting email discussion

### 8.11.2 Latency enhancements

Enhancements of signalling, and procedures for improving positioning latency of the Rel-16 NR positioning methods, for DL and DL+UL positioning methods. This agenda item will utilise a summary document.

Summary document

[R2-2107680](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107680%20-%20Summary%20of%20AI%208.11.2%20Latency%20enhancements%20(Intel).docx) "Summary of agenda 8.11.2 Latency enhancements" Intel Corporation discussion Rel-17 NR\_pos\_enh Late

Scheduled location time (reply needed to SA2 LS in R2-2106968):

Proposal 1: RAN2 is proposed to discuss whether scheduled location time can help in the reduction of the LCS latency.

Observation 1: On the need of indicating scheduled location time to the UE/NG-RAN, companies seem to have following interpretations (with option A having majority support):

 Option A: The scheduled location time does not need to be indicated to the UE or NG-RAN, since the LMF can implicitly trigger the positioning procedures at or close to it. Therefore, it is transparent to UE/NG-RAN stage-3 positioning procedures.

 Option B: Latency reduction can be accomplished by sending the scheduled location time T to the UEs and TRPs in order to trigger measurements at or close to it. Therefore, LPP and/or NRPPa signaling needs to be updated to indicate this information.

Proposal 2: RAN2 is proposed to discuss and agree that scheduled location time is considered transparent from UE/NG-RAN perspective and no additional specification impact is needed to support it.

Discussion:

CATT think we need to reply to SA2 with our evaluation of LCS latency; they understand that if there is no scheduled location time, the LMF cannot schedule the measurements in advance. So they see benefit to the scheduled location time.

Huawei do not understand the benefit and think the assumption of the analysis showing a benefit is that there would be no preparation phase; they also think the proposed response window is related to response time, and they see potential RAN4 impact.

Qualcomm think this is not just for RAT-dependent positioning; they find Huawei’s comment confusing and think the latency reduction is clear from the procedure. They understand that SA2’s use case is that the application knows in advance when the location is needed, and the location is needed at the indicated time, not when the request comes, so the only latency is from the measurement to the time the client receives the location. Qualcomm also note that high accuracy location is useless if the latency is unreasonable.

ZTE agree with CATT and Qualcomm that the benefit is in separating the preparation phase from the execution phase.

Intel think there is some benefit, and wonder what the intention is for the reponse LS: Will we say that RAN2 see some benefit but consider it transparent?

Xiaomi think if the LMF can predict the time when the location is needed, the latency can be reduced, and they think the LMF can trigger the procedures at the scheduled time (i.e. no stage 3 impact for us). They do not see additional latency reduction from sending the time to the UE or NG-RAN.

Nokia do not see the latency benefit in general; they think this is for a specialised use case where the preparation phase can be handled earlier, and they see more of a benefit in reliability/accuracy of the location estimate. However, they think the solution is valid in terms of reliability and accuracy. Ericsson have the same view as Nokia.

Lenovo agree with Nokia and Ericsson that this does not reduce the latency of the Rel-16 signalling procedures, because the network may not be able to meet a predictable delivery time; but they see that if a measurement window can be preconfigured, it would give some control, and so they see a decoupling between the latency benefits of the measurement window and the benefit of scheduling in advance.

* [AT115-e][612][POS] Reply LS to SA2 on scheduled location time (CATT)

Scope: Reply to the SA2 LS on scheduled location time, indicating RAN2 view on the latency benefit (to the extent agreement is possible) and understanding of RAN2 spec impact.

Intended outcome: Approvable LS in R2-2108943

Deadline: Tuesday 2021-08-24 0800 UTC

Preconfigured assistance data:

Agreement:

Proposal 3: Regarding the validity conditions/criteria associated with pre-configured assistance data, consider at least the following options:

 Option A: Based on a validity area (e.g. a list of cells)

 Option B: Based on a (configured) validity timer or a numerical limit on number of times it is utilized

 Option C: Based on explicit modification or release from the LMF/NG-RAN

 Option D: Based on the UE’s current location and/or the time

Discussion:

ZTE wonder if these are the same criteria as in RRC\_INACTIVE.

vivo think we need to establish the use case first.

Lenovo are OK with the proposal but wonder if option A is different from the SI validity area.

Nokia think the preconfigured assistance data are not necessarily dynamic; it may be fixed for certain levels of QoS, for example.

Proposal 4: Continue discussion on the need for supporting enhancements regarding use of pre-configured assistance data for positioning measurements, including:

 Support of an add/mod/release mechanism of PRS configurations

 Support dynamic triggering of a preconfigured PRS at UE by LMF or gNB for making measurements on DL-PRS and/or dynamic triggering of a preconfigured SRS at UE by gNB for transmitting SRS based on measurement report provided by UE

 Support priority indications for multiple (pre-)configured assistance data sets corresponding to multiple position fixes for UE-based and UE-assisted positioning.

Response time granularity (reply needed to RAN1 LS in R2-2106919):

Proposal 5: Based on RAN1’s input, RAN2 agrees to introduce finer granularity for responseTime IE. FFS if this can be accomplished by extending the ‘unit’ field to include e.g. “ten-milliseconds”.

Discussion:

Qualcomm think we need a capability for this, probably per positioning method. E.g. the fine response times do not make sense for GPS or WLAN.

Nokia wonder how this can guarantee reduced latency, because the UE should anyway report the results when it can. They wonder if there are associated performance requirements. Huawei think the measurement requirement is in RAN4 and the response time is an upper bound for the measurement period; they think the UE implementation will take the response time into consideration.

ZTE understand the intention of the proposal, but have a concern about whether this is RAN2 or RAN4 responsibility. Chair understands that there would be RAN2 impact to signal the new value.

* [AT115-e][613][POS] Reply LS to RAN1 on response time granularity (Huawei)

Scope: Draft a response to the RAN1 LS on response time granularity indicating that RAN2 can signal the finer granularity. Capability discussion is not included.

Intended outcome: Approvable LS in R2-2108944

Deadline: Tuesday 2021-08-24 0800 UTC

SA2 question on UE capability (reply needed to SA2 LS in R2-2106971):

Agreement:

Proposal 6 (modified): In response to the question asked by SA2 regarding UE positioning capability, ~~it is proposed to~~ capture that the positioning related UE capabilities can be variable.

NOTE: P6 was edited after agreement for clarity (deletion marked with strikeout). Checked in email discussion [AT115-e][600].

Discussion:

Qualcomm would like to remove “at least in certain cases”. Ericsson think it is similar to radio capability and they do not see specification impact in RAN.

Proposal 7: RAN2 further discuss if an indication shall be defined to inform the LMF on whether the UE capability is variable or not, to assist in the storage of UE positioning capabilities in the 5GC. Based on the decision, a response LS to SA2 shall be triggered.

Discussion:

CATT think there are two candidate solutions, one of which requires LPP enhancement and the other does not. They understand that it could be left to LMF implementation to poll when it needs the capability and then there would be no LPP impact.

Qualcomm understood that this was covered in the SA2 CR, which assumes the UE provides an indication. So they understand that we have to indicate if we agree with the SA2 solution or have another solution.

vivo think only the UL-related capability may be variable, and the AMF could store the fixed parts of the capability. So they do not see a need for a UE indication.

Huawei agree with vivo, and think from the standardisation pov the only variable UE capability is related to SRS which may be affected by the activated BC.

Ericsson agree with Huawei and vivo and think the UE can push the capability unsolicited when it changes.

OPPO think the indication does not work and an update of the capability would be better. They also think setting a validity timer is not needed since the change is dynamic; the UE does not know when the capability will change.

Intel agree with vivo/Huawei/Ericsson, and think we don’t need an indication from the UE to say that it is variable. They also think we have this problem in Rel-16, since the UL capability could change during a positioning session.

Qualcomm disagree with the view that only the UL capability is variable; e.g., the user may turn off location capability entirely.

* [AT115-e][614][POS] Reply LS to SA2 on capability storage (Qualcomm)

Scope: Reply to SA2 indicating that positioning capability is variable. We will give a finer-grained response e.g. which capabilities can vary only if consensus can be reached.

Intended outcome: Approvable LS in R2-2108945, report in R2-2109102

Deadline: Tuesday 2021-08-24 0800 UTC

Low priority items and issues to be postponed/down-prioritised:

Proposal 8 (Low priority): RAN2 is proposed to discuss if enhancements regarding the prioritization of PRS measurements/reporting should be supported in this release, considering at least the following proposed enhancements:

 Option A: Support of prioritization handling of DL PRS measurement

 Option B: Support of prioritization handling of reporting of measurements/location estimates

 Option C: Support of prioritization handling of DL signals/channels carrying LPP signaling

 Option D: Support of prioritization handling of DL PRS measurement associated with early location report

Proposal 9: RAN2 is proposed to down-prioritize discussion on enhancements related to lower-layer triggering of measurement request/reporting for latency reduction for this release.

Proposal 10 (Low priority): With regard to configured UL grant for location reporting, RAN2 can discuss the following aspects for CG-based solution in RRC\_CONNECTED mode:

 How the CG parameters are configured:

o Based on the PRS measurement period and starting position in time of the other TRPs

o Definition of additional finer time granularities for both reportingAmount and reportingInterval IEs within the periodicalReporting configuration in LPP message

 How the CG information is indicated to the gNB:

o CG configuration information via LMF

o CG configuration information via UE

Proposal 11: RAN2 is proposed to postpone discussion on additional proposed enhancements at least until higher priority issues are resolved.

[R2-2108943](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2108943%20Reply%20LS%20to%20SA2%20on%20scheduled%20location%20time.doc) Reply LS to SA2 on scheduled location time CATT LS out Rel-17 NR\_pos\_enh-Core To:SA2

Discussion:

Nokia think some comments on the latency and transparency aspects are not reflected.

Apple point out the action says RAN1 instead of SA2.

Qualcomm agree with Nokia, but understand we can continue to work on the feature in RAN2 after sending the LS. From reading the email comments they thought there was convergence in principle, with differences just about naming.

Huawei agree with Qualcomm’s view, and think SA2 only asked whether this can reduce latency; the LS answers this question, and RAN2 can further investigate e.g. for spec impact. Intel agree.

Nokia are OK with sending the LS and continuing to discuss in RAN2.

* Approved as R2-2108958

[R2-2108944](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2108944%20Draft%20reply%20LS%20to%20RAN1%20on%20response%20time%20granularity.docx) Draft reply LS on granularity of response time Huawei LS out Rel-17 NR\_pos\_enh-Core To:RAN1

Apple note the action should be corrected from RAN2 to RAN1.

* Approved as R2-2108959

[R2-2108945](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2108945_(Response%20LS%20to%20SA2%20on%20storage%20of%20UE%20Positioning%20Capabilities).docx) [draft] Response LS on storage of UE Positioning Capabilities Qualcomm Incorporated LS out Rel-17 FS\_NR\_pos\_enh To:SA2 Cc:RAN1, RAN3

* Approved in R2-2108960

[R2-2109102](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2109102_(%5bAT115-e%5d%5b614%5d%5bPOS%5d%20Reply%20LS%20to%20SA2%20capability)_Summary.docx) Summary of [AT115-e][614][POS] Reply LS to SA2 on capability storage (Qualcomm) Qualcomm Incorporated discussion

The following documents will not be individually treated

[R2-2107090](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107090%20Discussion%20on%20positioning%20latency%20reduction.docx) Discussion on positioning latency reduction ZTE discussion

[R2-2107091](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107091%20Discussion%20on%20scheduled%20location%20time.docx) Discussion on scheduled location time ZTE discussion

[R2-2107132](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107132%20Discussion%20on%20Response%20LS%20on%20Scheduling%20Location.docx) Discussion on Response LS on Scheduling Location in Advance to reduce Latency from SA2 CATT discussion Rel-17 NR\_pos\_enh-Core

[R2-2107134](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107134%20Discussion%20on%20Enhancements%20for%20Latency%20Reduction.docx) Discussion on Enhancements for Latency Reduction CATT discussion Rel-17 NR\_pos\_enh-Core

[R2-2107135](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107135.docx) Discussion on storage of UE Positioning Capabilities LS from SA2 and the granularity of response time LS from RAN1 CATT discussion Rel-17 NR\_pos\_enh-Core

[R2-2107399](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Docs\R2-2107399.zip) Further consideration of positioning latency enhancements OPPO discussion Rel-17 NR\_pos\_enh-Core

[R2-2107500](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107500%20Discussion%20on%20positioning%20latency.docx) Discussion on positioning latency Huawei, HiSilicon discussion Rel-17 NR\_pos\_enh-Core

[R2-2107641](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107641%20Discussion%20on%20latency%20enhancement.docx) Discussion on latency enhancement vivo discussion Rel-17 NR\_pos\_enh-Core

[R2-2107642](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107642%20Discussion%20on%20Scheduling%20Location%20in%20Advance%20to%20reduce%20Latency.docx) Discussion on Scheduling Location in Advance to reduce Latency vivo discussion Rel-17 NR\_pos\_enh-Core

[R2-2107670](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107670.docx) Scheduled location time based latency reduction Intel Corporation discussion Rel-17 NR\_pos\_enh

[R2-2107673](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107673%20Storing%20UE%20positioning%20capability%20in%20AMF.docx) Storing UE positioning capability in AMF Intel Corporation discussion Rel-17 NR\_pos\_enh

[R2-2107681](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107681%20(R17%20NR%20POS%20WI_AI8112_Latency).doc) Discussion on Enhancements for Latency Reduction InterDigital, Inc. discussion Rel-17 NR\_pos\_enh

[R2-2107962](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107962%20Discussion%20on%20the%20response%20time_final.docx) Discussion on the response time Samsung discussion Rel-17

[R2-2108127](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2108127_PosLatencyReduction_LenMM.docx) Positioning Latency Reduction Enhancements Lenovo, Motorola Mobility discussion Rel-17

[R2-2108175](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2108175%20Positioning%20enhancements%20on%20latency%20reduction.doc) Positioning enhancements on latency reduction Xiaomi discussion

[R2-2108367](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2108367_(Scheduling%20Location%20in%20Advance).docx) Scheduling Location in Advance to Reduce Latency Qualcomm Incorporated discussion

[R2-2108376](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2108376_(Response%20LS%20to%20SA2%20on%20on%20Scheduling%20Location%20in%20Advance).docx) [draft] Response LS on Scheduling Location in Advance to reduce Latency Qualcomm Incorporated LS out Rel-17 FS\_NR\_pos\_enh To:SA2 Cc:RAN1, RAN3

[R2-2108377](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2108377_(Pos%20Capabilities).docx) LPP impacts for UE positioning capability storage Qualcomm Incorporated discussion

[R2-2108378](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2108378_(Response%20LS%20to%20SA2%20on%20storage%20of%20UE%20Positioning%20Capabilities).docx) [draft] Response LS on storage of UE Positioning Capabilities Qualcomm Incorporated LS out Rel-17 To:SA2 Cc:RAN3

[R2-2108393](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2108393%20latency.docx) Utilizing Time T and other associated parameters Ericsson discussion

[R2-2108397](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2108397%20Positioning%20Capabilities.docx) On UE Positioning Capabilities Ericsson discussion

[R2-2108536](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2108536%20Discussion%20on%20latency%20reduction%20for%20positioning.docx) Discussion on latency reduction for positioning CMCC discussion Rel-17 NR\_pos\_enh-Core

[R2-2108704](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2108704%20Enhancement%20to%20reduce%20latency%20for%20high%20volume%20positioning.docx) Enhancement to reduce latency for high volume positioning Nokia, Nokia Shanghai Bell discussion Rel-17 NR\_pos\_enh-Core

[R2-2108769](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2108769%20(8.11.2)%20Handling%20of%20multiple%20QoS%20for%20latency%20reduction.docx) Handling of multiple QoS for latency reduction Samsung Electronics discussion NR\_pos\_enh-Core

[R2-2108771](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2108771%20(8.11.2)%20Latency%20reduction%20via%20configured%20grant%20for%20positioning%20.docx) Latency reduction via configured grant for positioning Samsung Electronics discussion NR\_pos\_enh-Core

[R2-2108773](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2108773%20(8.11.2)Discussion%20on%20the%20scheduled%20location%20time.docx) Discussion on the scheduled location time Samsung Electronics discussion NR\_pos\_enh-Core

### 8.11.3 RRC\_INACTIVE

Methods, measurements, signalling and procedures to support positioning for UEs in RRC\_ INACTIVE state, for UE-based and UE-assisted positioning solutions. UL and DL+UL NR positioning methods and gNB positioning measurements for UEs in RRC\_INACTIVE are treated at lower priority. This agenda item will utilise a summary document.

Including outcome of [Post114-e][602][POS] Stage 2 procedure for deferred MT-LR in RRC\_INACTIVE (Qualcomm)

Email discussion summary

[R2-2108383](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2108383_(%5bPost114-e%5d%5b602%5d%5bPOS%5d%20Inactive)_Summary.doc) Summary of [Post114-e][602][POS] Stage 2 procedure for deferred MT-LR in RRC\_INACTIVE Qualcomm Incorporated discussion Late

Agreements:

LPP PDU and LCS message transfer:

Proposal 1: The LPP PDU Transfer Procedure in Annex A is used as baseline for further work.

NOTE 1: Some details may depend on further progress of the SDT work item.

NOTE 2: Whether such a procedure needs to be captured in Stage 2 specification or not can be decided later when the procedure has been fully developed/agreed. That is, the procedure can be considered as "running baseline".

Proposal 2: The LCS Message Transfer Procedure in Annex B is used as baseline for further work.

NOTE 1: Some details may depend on further progress of the SDT work item.

NOTE 2: Whether such a procedure needs to be captured in Stage 2 specification or not can be decided later when the procedure has been fully developed/agreed. That is, the procedure can be considered as "running baseline".

Proposal 3: UL LPP message segmentation can also be used by the UE in RRC\_INACTIVE state; i.e., a LPP message body can be sent in several shorter LPP messages instead of one long LPP message by using the SDT "Subsequent Data Transmission" phase. FFS spec impact.

DL and RAT-independent positioning:

Proposal 4: The Deferred 5GC-MT-LR Procedure with SDT for DL-only and RAT-independent positioning in Annex C is used as baseline for further work.

NOTE 1: Some details may depend on further progress of SDT work item.

NOTE 2: Whether such a procedure needs to be captured in Stage 2 specification or not can be decided later when the procedure has been fully developed/agreed. That is, the procedure can be considered as "running baseline".

NOTE 3: Once the procedure is stable from RAN2 perspective, send an LS to SA2 including the baseline procedure.

Discussion:

ZTE disagree with P1 and P2; in respect of note 2, they think there should be no stage 2 impact, and would like to add the option just to add a NOTE in the spec. Apple agree with ZTE. Chair thinks this is compatible with the proposals; ZTE think we should not put much effort into something we may eventually not capture.

Ericsson think there are alternative starting points for how we capture it in stage 2.

Xiaomi think if an RRC\_INACTIVE UE decides to transit to RRC\_CONNECTED, this case is not covered in the proposed procedure.

Apple do not agree with the proposed text in Annex A as a spec baseline, but are OK with the concept. They can accept the proposals if it’s clear that we are not adopting spec text.

UL positioning:

Proposal 5: For UL-based positioning (UL-only and UL+DL positioning) in RRC\_INACTIVE state, the SRS configuration can be provided to the UE in an RRC Release message.

Proposal 6: For the Deferred 5GC-MT-LR Procedures with SDT for UL-only positioning, the two procedures summarized in Annex D are used as baseline for further work and should be studied/analysed further.

NOTE 1: Some details may depend on further progress of SDT work item.

NOTE 2: Whether one or both procedures in Annex D need to be captured in Stage 2 specification or not can be decided later when the procedures have been fully developed/agreed.

NOTE 3: Possible combinations of the two procedures may also be considered, where possible/applicable.

NOTE 4: Once the procedure(s) is/are stable from RAN2 perspective, send an LS to SA2 including the baseline procedure(s).

UL+DL positioning:

Proposal 7: For the Deferred 5GC-MT-LR Procedures with SDT for UL+DL positioning, the two procedures summarized in Annex E are used as baseline for further work and should be studied/analysed further.

NOTE 1: Some details may depend on further progress of SDT work item.

NOTE 2: Whether one or both procedures in Annex E need to be captured in Stage 2 specification or not can be decided later when the procedures have been fully developed/agreed.

NOTE 3: Possible combinations of the two procedures may also be considered, where possible/applicable.

NOTE 4: Once the procedure(s) is/are stable from RAN2 perspective, send an LS to SA2 including the baseline procedure(s).

Summary document

[R2-2108826](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2108826%20Summary%20of%20AI%208.11.3%20for%20RRC_INACTIVE%20positioning(ZTE).docx) Summary of AI 8.11.3 for RRC INACTIVE positioning ZTE discussion

Agreement:

(High priority)Proposal 1: Support all the RAT independent positioning methods in RRC\_INACTIVE state.

(High priority)Proposal 2 (modified): Support to deliver the positioning assistance data to UE via the following options:

• Option 1: The existing deferred MT-LR procedure

• Option 2: positioning system information, i.e. posSIB

• Option 3: pre-configured assistance data when UE in RRC\_CONNECTED state

• Option 4: ongoing SDT procedure

(High priority)Proposal 3: For the alignment between the positioning measurement and the SDT configuration, consider the following alternatives:

• Alt 1: Support LMF to inform gNB the estimate data size of measurement report

• Alt 2: Support LMF to inform gNB the measurement periodicity

• Alt 3: Support LMF to inform gNB the positioning requirements

• Alt 4: Support gNB to inform LMF the SDT data volume threshold

• Alt 5: Support differential measurement report

• Alt 6: No optimization should be introduced for positioning measurement report

FFS: Whether to discuss this issue in SDT agenda or positioning agenda.

Discussion:

vivo have a concern about the FFS for the unicast tag in P2; they do not see the need.

Nokia wonder what options 1 and 4 in P2 mean, and thought other aspects were already agreed.

(Medium priority)Proposal 4: Further study the assistance information transmitted from UE to gNB. The assistance information may include following aspects:

• type of reporting (e.g. periodic, aperiodic)

• payload size of LPP message (e.g. measurement report/location estimates)

• start timing

• measurement duration

• reporting periodicity

(Medium priority)Proposal 5: For the PRS configuration used for RRC\_INACTIVE state, consider the following alternatives:

• Alt 1: Configure RNA information in the PRS configuration

• Alt 2: Configure validity conditions (e.g. time validity, area validity) in the PRS configuration

• Alt 3: No change should be introduced in PRS configuration

Note: This does not necessarily mean to expose RRC state to LMF.

(Medium priority)Proposal 6: Further study on whether to associate UE location measurement report with RNA update.

(Medium priority)Proposal 7: Further study to provide segmentation configuration information from LMF to UE. The segmentation configuration information includes:

• the segmentation criteria

• indications (e.g. IDs, flag, end-marker) and sequence numbers

Note: this does not necessarily mean to expose RRC state to LMF.

Common aspects of UL and DL positioning:

(High priority)Proposal 8: Support MO-LR, MT-LR and deferred MT-LR for RRC\_INACTIVE state.

UL/DL+UL positioning:

(High priority)Proposal 9: Support at least periodic SRS in RRC\_INACTIVE state.

FFS: whether it should be discussed separately for RRC\_INACTIVE state without SDT and RRC\_INACTIVE state with ongoing SDT

FFS: whether and how to support semi-persistent and aperiodic SRS in RRC\_INACTIVE state

(Low priority)Proposal 10: Support SRS configuration carried by:

• SDT DL RRC message

• Message B or 4 can be considered in the case when 2 or 4 step RACH based access is chosen for SDT

• RRCRelease with SuspendConfig

• SRS configuration in RRC\_CONNECTED

• positioning system information, i.e. posSIB

• FFS: whether power control and TA should be discussed by RAN2

(Low priority)Proposal 11: Further study UE to update request of SRS configuration for positioning in RRC\_INACTIVE state.

• Option 1: the request is sent via RRC message

• Option 2: the request is sent via LPP message

Way-forward of stage 2 modification:

(Medium priority)Proposal 12: RAN2 to confirm the consolidated solution in Section 3.1.1 and 3.1.2 for UL and UL+DL positioning as the baseline for positioning in RRC\_INACTIVE state. FFS how to capture into the stage2 spec.

Way forward proposal

[R2-2108605](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2108605%20Way-forward%20on%20INACTIVE%20positioning_v06.docx) Way-forward for INACTIVE positioning Huawei, China Unicom, China Telecom, Futurewei, HiSilicon, Intel Corporation, Interdigital, Spreadtrum Communications, VIVO, Xiaomi, ZTE Corporation discussion Rel-17 NR\_pos\_enh-Core Late

Consolidated solution for stage2 description for INACTIVE positioning

Proposal 1: RAN2 to confirm the consolidated solution in Section 3.1.1 and 3.1.2 for UL and UL+DL positioning as the baseline for positioning in RRC\_INACTIVE state. FFS how to capture into the stage2 spec.

Adopt the following CG-SDT approaches for SRS in RRC\_INACTIVE.

Proposal 2: Follow the CG\_SDT approach for SRS configuration and TA

 Proposal2.1: SRS configuration for UL positioning in RRC\_INACTIVE is carried in RRCRelease message with suspendConfig.

 Proposal2.2:The SRS configuration is released when the UE sends RRCResumeRequest to an gNB other than the gNB where it is released to INACTIVE state.

 Proposal2.3: TA configuration is included in RRCRelease with suspendConfig for UL positioning in RRC\_INACTIVE.

 Proposal2.4: When cell reselection is performed when UE is configured with SRS in RRC\_INACTIVE, the TAT for SRS is considered as expired.

 Proposal2.5: gNB configures upper and lower threshold for RSRP change for the TA validation of SRS transmission.

* [AT115-e][615][POS] UL and UL+DL positioning in RRC\_INACTIVE (Huawei)

Scope: Evaluate the proposed UL and UL+DL positioning schemes and attempt to converge on an agreeable procedure.

Intended outcome: Report in R2-2108946

Deadline: Tuesday 2021-08-24 0800 UTC

[R2-2108946](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2108946%20Summary%20of%20%5bOffline-615%5d%5bPOS%5d%20UL%20and%20UL%20DL%20positioning%20in%20RRC_INACTIVE%20(Huawei).docx) [AT115-e][615][POS] UL and UL DL positioning in RRC\_INACTIVE (Huawei) Huawei discussion

Proposal 1: gNB can configure the UE with periodic SRS by RRCRelease with suspendConfig when periodic event is configured for deferred MT-LR.

Discussion:

vivo think RAN1 have not decided on the SRS type and we should have an appropriate condition.

Qualcomm think the proposal does not need to be restricted to periodic events. Huawei think this goes beyond what was discussed and is something of a stage 3 aspect; they wonder how aperiodic SRS can work.

Intel generally agree with the proposal in the general form suggested by Qualcomm, and the original P1 would follow.

Xiaomi wonder if P1 implies only the periodic case would be supported.

Agreement:

gNB can configure the UE with periodic SRS (assuming periodic SRS is supported in RRC\_INACTIVE) by RRCRelease with suspendConfig at least when periodic event is configured for deferred MT-LR. Other cases can be further discussed.

Proposal 2: Adopt Solution 4.3 in R2-2108946 as baseline stage2 procedure for UL and UL+DL positioning in RRC\_INACTIVE

Discussion:

Qualcomm cannot accept this solution; they feel it was developed on the fly and have doubts if it actually works. They would be OK with the Huawei solution from the email discussion as a baseline.

Huawei can accept Qualcomm’s suggestion to take the Huawei solution; they see the difference being only an add-on feature for the periodic SRS case.

The following documents will not be individually treated

[R2-2107092](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107092%20Discussion%20on%20positioning%20in%20RRC%20INACTIVE%20state.docx) Discussion on positioning in RRC INACTIVE state ZTE discussion

[R2-2107093](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107093%20Stage%202%20procedures%20for%20positioning%20in%20RRC%20INACTIVE%20state.docx) Stage 2 procedures for positioning in RRC INACTIVE state ZTE discussion

[R2-2107142](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107142%20Positioning%20for%20UEs%20in%20RRC_INACTIVE%20state.docx) Discussion on Positioning for UEs in RRC\_INACTIVE state CATT discussion Rel-17 NR\_pos\_enh-Core

[R2-2107149](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107149_RRC_INACTIVE_Fraunhofer.docx) Considerations on positioning in RRC\_INACTIVE mode Fraunhofer IIS; Fraunhofer HHI discussion

[R2-2107358](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107358%20-%20Discussion%20on%20positioning%20in%20RRC_INACTIVE%20state.docx) Discussion on positioning in RRC\_INACTIVE state Spreadtrum Communications discussion Rel-17

[R2-2107502](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107502%20Draft%20LS%20to%20SA2%20on%20INACTIVE%20positioning.docx) [DRAFT] LS on positioning for the UE in RRC\_INACTIVE Huawei, HiSilicon LS out Rel-17 NR\_pos\_enh-Core To:SA2

[R2-2107639](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107639%20Positioning%20Procedures%20in%20RRC_INACTIVE%20(stage-2)%20-%20v2.docx) Positioning procedures in RRC\_INACTIVE (stage-2) Apple discussion Rel-17 NR\_pos\_enh-Core

[R2-2107643](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107643%20Enhancement%20of%20DL%20positioning%20in%20RRC_INACTIVE.docx) Enhancement of DL positioning in RRC\_INACTIVE vivo discussion Rel-17 NR\_pos\_enh-Core

[R2-2107644](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107644%20Configuration%20of%20UL%20positioning%20in%20RRC_INACTIVE.docx) Configuration of UL positioning in RRC\_INACTIVE vivo discussion Rel-17 NR\_pos\_enh-Core

[R2-2107671](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107671%20Support%20of%20Positioning%20in%20RRC_INACTIVE.docx) Support of Positioning in RRC\_INACTIVE Intel Corporation discussion Rel-17 NR\_pos\_enh

[R2-2107683](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107683%20(R17%20NR%20POS%20WI%20AI8113_INACTIVE_AD).doc) Discussion on Positioning in RRC INACTIVE state InterDigital, Inc. discussion Rel-17 NR\_pos\_enh

[R2-2107684](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107684%20(R17%20NR%20POS%20WI%20AI8113_INACTIVE_SDT).doc) Discussion on reporting of Positioning Information with SDT InterDigital, Inc. discussion Rel-17 NR\_pos\_enh

[R2-2107829](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107829-%20Supporting%20positioning%20in%20RRC_INACTIVE%20state.docx) Supporting positioning in RRC\_INACTIVE state OPPO discussion Rel-17 NR\_pos\_enh-Core

[R2-2107830](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107830-%20Discussion%20on%20UL%20Positioning%20methods%20in%20RRC_INACTIVE%20state.docx) Discussion on UL Positioning methods in RRC\_INACTIVE state OPPO discussion Rel-17 NR\_pos\_enh-Core

[R2-2108068](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2108068_Pos_Inactive.docx) Considerations on positioning RRC Inactive Sony discussion Rel-17 NR\_pos\_enh-Core R2-2105703

[R2-2108128](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2108128_RRCInactive_Positioning_LenMM.docx) On Positioning in RRC\_INACTIVE state Lenovo, Motorola Mobility discussion Rel-17

[R2-2108173](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2108173%20Discussion%20on%20positioning%20for%20UEs%20in%20RRC%20Inactive.doc) Discussion on positioning for UEs in RRC Inactive Xiaomi discussion

[R2-2108394](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2108394%20Inactive%20mode.docx) Inactive mode Positioning Ericsson discussion

[R2-2108703](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2108703%20Considerations%20on%20positioning%20in%20RRC_INACTIVE.docx) Considerations on positioning in RRC\_INACTIVE Nokia, Nokia Shanghai Bell discussion Rel-17 NR\_pos\_enh-Core

[R2-2108764](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2108764%20Considerations%20on%20Positioning%20in%20RRC_INACTIVE%20state.docx) Considerations on Positioning in RRC\_INACTIVE state CMCC discussion Rel-17 NR\_pos\_enh-Core Late

[R2-2108772](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2108772%20(8.11.3)%20On%20message%20segmentation%20for%20transmitting%20in%20Inactive%20state.docx) On message segmentation for transmitting in Inactive state Samsung Electronics discussion NR\_pos\_enh-Core

### 8.11.4 On-demand PRS

Specify UE-initiated and LMF-initiated on-demand transmission and reception of DL PRS for DL and DL+UL positioning for UE-based and UE-assisted positioning solutions. This agenda item will utilise a summary document.

Including outcome of [Post114-e][603][POS] Procedures and signalling for on-demand PRS (Ericsson)

Incoming LS

[R2-2109061](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2109061_R1-2108383.docx)         LS to RAN2 with update on RAN1 discussion for on-demand DL PRS (R1-2108383; contact: Intel)

Discussion:

Intel understand that RAN1 can give us lists 1 and 2, and further discussion can proceed in RAN2.

Qualcomm recall that we left it FFS if the UE can request a configuration with different parameters, and the idea was for RAN1 to conclude this and provide a list of parameters. So they understand that the FFS is still a problem in RAN1 and we may not be able to resolve it in RAN2; they think RAN1 need to decide.

vivo agree with Intel and think RAN1 need to decide what parameters can be on-demand.

ZTE think there is no need for lists 3 and 4, which would be more like delta configurations.

Lenovo agree that lists 1 and 2 are sufficient; for lists 3 and 4, they think there may be some confusion as to whether the preconfiguration parameters need to be provided, and we may be able to discuss this further in RAN2.

Intel understand that RAN1 do not know the procedure for preconfigured parameters, which makes it difficult for them to discuss the preconfigured parameters.

CATT think lists 1 and 2 will allow us to make a decision on whether the preconfigurations should be defined by RAN1 or RAN2, but we need to discuss the stage 2 procedures together with this question.

Apple agree that we can work with lists 1 and 2; on the FFS mentioned by Qualcomm, they think this was not discussed in RAN1 but agree we may need some feedback from them at some point.

Nokia think we should make it clear that we want from RAN1 all the parameters that can be dynamically adjusted, and they do not see why preconfiguration is brought into the discussion. Intel agree.

* [AT115-e][618][POS] Reply LS to RAN1 on on-demand PRS parameters (Intel)

Scope: Draft an LS replying to R2-2109061, indicating that we need to know the set of parameters that can be dynamically adjusted.

Intended outcome: Approved LS in R2-2108950

Deadline: Tuesday 2021-08-24 2000 UTC

[R2-2108950](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2108950%20Draft%20Reply%20LS%20to%20RAN1_v05.docx) Draft Reply LS to RAN1 on on-demand DL PRS parameters Intel LS out Rel-17 NR\_pos-Core To:RAN1

* Approved as R2-2109123

Email discussion summary

[R2-2108400](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2108400%20onDemand%20PRS%20email.docx) Report on [Post114-e][603][POS] Procedures and signalling for on-demand PRS (Ericsson) Ericsson discussion Late

[Stage 2 procedure]

Proposal 5 RAN2 to use the above steps 1 to 6 as baseline for on-demand DL-PRS stage 2 description.

[Chair’s note: The reference is to the steps after Q6 and Q7 in R2-2108400:

1. LMF may provide available DL-PRS configuration via LPP provide assistance data message or via posSI.

2. UE sends an on-Demand DL-PRS request request via LPP request assistance data message.

3. LMF determines the need of a new on-Demand DL-PRS configuration.

4. LMF requests the serving and non-serving gNBs/TRPs for a new on-Demand DL-PRS configuration via NRPPa.

5. The gNBs/TRPs provide the DL-PRS transmission update in the NRPPa response message accordingly.

6. LMF provides the on-demand DL-PRS configuration via LPP provide assistance data message or posSI to the UE.

Note: LMF may use existing positioning methods to obtain (ECID) SSB/CSI-RS RSRP measurements or (DL-AoD) DL-PRS RSRP measurements in order to assist step 3.

Editor’s Note: Depending upon RAN3 input, the above description may need to be updated especially for NRPPa procedure.

]

Discussion:

Qualcomm think this proposal does not match the email discussion questions, and they think it does not properly cover the UE-triggered case; if we start with a Request Assistance Data from the UE to the server as shown, it implies that we only support UE-triggered request in an ongoing LPP session. So they understand that we need to capture the request as part of the initial service request.

Ericsson think step 1 is optional, and in step 2 the UE always has the option to send this on-demand request; they understand that this is compatible with the MO-LR procedure and there is nothing special to capture for this case.

vivo think LMF should decide the possible on-demand PRS configurations in the very beginning and we should give some guidance to RAN3 in this direction. So they think there should be a step 0 to show how the LMF gets this information.

Huawei have a similar concern to Qualcomm; for MO-LR, they wonder when the UE begins to measure the PRS and how it knows when to request on-demand PRS. For MO-LR, they think it is only feasible for the UE to obtain the on-demand configuration from the positioning SIBs. They think we should consider deferred MT-LR first, and for immediate MT-LR it cannot be supported because it is a one-shot positioning fix.

Xiaomi agree with vivo and think there should be an NRPPa procedure before step 1.

Qualcomm think currently there is no MO-LR for on-demand PRS, and SA2/CT4 need to decide the details. To Huawei’s comment, they think we need “list 2” from RAN1 to clarify what parameters we put in the Request Assistance Data message. They think we could add a note that the UE can send the MO-LR to request on-demand, and this information needs to be provided to SA2.

Intel think normally the UE has no idea what positioning method will be used, so even for MO-LR the UE should initiate the procedure before knowing if it needs on-demand PRS (e.g. what if the LMF then selects GNSS?). Huawei think for MO-LR, the only way for the UE to request DL-PRS is in relation to the posSIB. Qualcomm understand that if the client is in the UE and there is no PRS, all the UE can do is request the PRS; a client who wants to use DL-TDOA for UE-based positioning needs PRS.

Nokia think we can further discuss the MO-LR case and leave it FFS for now; in the case of the client being in the device, they would like to understand the scenario from Huawei and Qualcomm and think we can continue discussion.

Qualcomm think MO-LR for autonomous UE self-location allows the UE to request assistance data; if we do not support MO-LR for on-demand, they wonder what scenarios are supported, e.g. only when the UE has an active LPP session. Ericsson understand that it can be done during an LPP session, e.g. by having the LMF request the UE’s preference.

Chair understands that if we require the LMF to do something to trigger the UE, we require an ongoing LPP session, and if we do not require the LMF to do something to trigger the UE, then we need MO-LR.

Qualcomm think for UE-based DL positioning with no DL-PRS ongoing, the UE must be able to request, i.e. we cannot restrict to during an LPP session.

Ericsson suggest for the first request, the UE does not request DL-PRS, and subsequent MO-LR can include the on-demand request.

Agreements:

Before providing available DL-PRS configuration to the UE, the LMF may obtain configuration information on what DL-PRS can be supported from one or more TRPs via NRPPa.

Capture the steps provided above as a baseline, along with a note indicating it remains FFS if the UE can send the MO-LR to request on-demand PRS.

FFS if we indicate to SA2 that MO-LR can be used to trigger on-demand PRS procedure.

It is up to Network (LMF) implementation on the steps to follow (accept/reject/ignore) on receiving request from UE for changing the DL-PRS configurations.

Proposal 6 It is up to Network (LMF) implementation on the steps to follow (accept/reject/ignore) on receiving request from UE for changing the DL-PRS configurations.

[Trigger for initiation]

Proposal 1 RAN2 to discuss whether any trigger criteria for the UE to initiate on-demand PRS is required or not.

Proposal 2 RAN2 to discuss if UE trigger is based upon assisting NW for energy savings, based upon measurement quality and whether Positioning QoS is met or not. (Depending upon P1 outcome if RAN2 agree the need of trigger criteria)

Proposal 3 LMF decision on the trigger for On-Demand DL-PRS request is up to Network implementation.

[Request Assistance Data contents]

Proposal 4 RAN2 to wait for RAN1 on decision to include on-demand DL-PRS request in an LPP Request Assistance Data message with Explicit parameter defining a DL-PRS configuration.

[UE configuration selection]

Proposal 7 RAN2 to perform down selection among below Options or select multiple of the below Options

• UE can select any configuration pre-configured by LMF, and it is LMF to decide which PRS to give to the UE.

• It is up to UE implementation to ensure that UEs will not request higher level of PRS configurations if a lower level of PRS configuration can satisfy its QoS

• The configurations are sorted in priority order from NW to UE and UE may select multiple and provide the selection in priority order.

• LMF to indicate UE with the mapping between the triggering conditions (e.g. measurements quality) detectable at UE and the allowed PRS configurations.

[Repeated request from UE/prohibit timer]

Proposal 8 RAN2 to select one of the below two Options whether existing TS 38.305 procedure is adequate or a prohibit timer is needed.

• Option 1: The UE behaviour is already specified in the TS 38.305. If any of the UE requested assistance data in step (1) are not provided in step 2, the UE shall assume that the requested assistance data are not supported, or currently not available at the LMF.”

• Option 2: A prohibit timer is specified which allows UE to request again after certain interval

[UE capability and impact between UEs]

Proposal 9 UE capability to support R17 new DL-PRS assistance data for on-demand DL PRS configurations is needed. More details to be obtained from RAN1.

Proposal 10 RAN2 to discuss how to ensure UEs using existing DL-PRS need not be impacted by on demand DL-PRS from other UEs

[Configuration request causes]

Proposal 11 RAN2 agrees the need of additional assistance information is useful, however the content and how to convey such additional information is FFS.

[Feedback from UE on PRS performance]

Proposal 12 The DL-PRS measurement report with list containing the best TRPs and worst TRPs are discussed as part of SON/MDT WI.

Proposal 13 Additional measurement configuration such that UE provides feedback on the measurement quality of the latest PRS resource allocation for PRS overhead optimization is discussed as part of SON/MDT.

Summary document

[R2-2108827](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2108827%20Summary%20of%20AI%208.11.4%20On-demand%20PRS.docx) Summary of Agenda Item 8.11.4 On-demand PRS CATT discussion Rel-17 NR\_pos\_enh-Core

Easily Agreeable

Proposal 2: RAN2 to agree the on-demand PRS response can be enabled by enhancing the current LPP Provide Assistance Data message.

Need Further Discussion

Stage-2 impacts:

Proposal 7: RAN2 to further discuss the overall sequences of operations proposed by [13](Figure 5-2) via email discussion.

Stage-3 impacts:

Proposal 1: RAN2 to further discuss the detailed message design for the on-demand PRS request, e.g. per positioning method? Is a new LPP assistance data IE indicating the requested DL-PRS configurations required?

Proposal 3: RAN2 to further discuss the detailed message design within the on-demand PRS response under two use cases:

Case 1: the on-demand PRS request is fully accepted by LMF;

- FFS ACK or an identifier associate with a PRS configuration;

Case 2: the on-demand PRS request isn’t (fully) accepted by LMF;

- FFS indication for UE to stop sending on-demand PRS;

- FFS Error indication with error causes if the PRS request is not fully accepted;

- FFS PRS configuration which is not requested by UE if the PRS request is not fully accepted.

Proposal 4: RAN2 to further discuss the detailed configurations of the pre-configured available DL-PRS, i.e., FFS the maximum number of PRS configurations, FFS the list of available PRS configurations associated with different area.

Additional topics:

Proposal 8: RAN2 to further discuss the following other issues of on-demand PRS:

- Network control of on-demand PRS

- Supported scenarios for on-demand PRS

- Inactive on-demand PRS

- Collision of PRS

- Beam management

- Semi-persistent/A-periodic PRS

Dependencies on other groups:

Proposal 5: RAN2 to wait for RAN3’s conclusion on the on-demand PRS related detailed message design between NG-RAN and LMF.

Proposal 6: RAN2 to further discuss on how to support on-demand PRS parameters after receiving the RAN1’s response LS on the on-demand PRS parameters.

The following documents will not be individually treated

[R2-2107094](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107094%20Discussion%20on%20on-demand%20PRS.docx) Discussion on on-demand PRS ZTE discussion

[R2-2107148](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107148_OnDemandPRS_Fraunhofer.docx) On-demand PRS Fraunhofer IIS, Fraunhofer HHI discussion Rel-17 R2-2105734

[R2-2107498](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107498%20Discussion%20on%20on-demand%20PRS.docx) Discussion on on-demand PRS Huawei, HiSilicon discussion Rel-17 NR\_pos\_enh-Core

[R2-2107638](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107638%20On%20Demand%20PRS%20-%20v1.docx) Remaining issues of On-Demand PRS Apple discussion Rel-17 NR\_pos\_enh-Core

[R2-2107645](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107645%20Discussion%20on%20on-demand%20PRS.docx) Discussion on on-demand PRS vivo discussion Rel-17 NR\_pos\_enh-Core

[R2-2107672](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107672.docx) Support of on-demand PRS request Intel Corporation discussion Rel-17 NR\_pos\_enh

[R2-2107686](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107686%20(R17%20NR%20POS%20WI_AI8114_OnDemand_DL).doc) Discussion on procedures for On-demand PRS for DL-based positioning InterDigital, Inc. discussion Rel-17 NR\_pos\_enh

[R2-2107687](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107687%20(R17%20NR%20POS%20WI_AI8114_OnDemand_DL+UL).doc) Discussion on procedure for On-demand PRS for DL+UL based positioning InterDigital, Inc. discussion Rel-17 NR\_pos\_enh

[R2-2107828](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107828-%20Discussion%20on%20on-demand%20DL-PRS.doc) Discussion on on-demand DL-PRS OPPO discussion Rel-17 NR\_pos\_enh-Core

[R2-2108069](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2108069_Pos_PRS_Ondemand.docx) Considerations on positioning PRS On-demand Sony discussion Rel-17 NR\_pos\_enh-Core R2-2105704

[R2-2108129](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2108129_On-DemandPRS_LenMM.docx) Support of On-Demand DL-PRS Lenovo, Motorola Mobility discussion Rel-17

[R2-2108174](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2108174%20Positioning%20enhancement%20to%20on-demand%20DL%20PRS%20.doc) Positioning enhancement to on-demand DL PRS Xiaomi discussion

[R2-2108384](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2108384_(On-demand%20PRS).docx) On-Demand DL-PRS Qualcomm Incorporated discussion

[R2-2108395](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2108395%20On%20Demand.docx) On demand PRS Ericsson discussion R2-2105969

[R2-2108705](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2108705%20On-demand%20PRS%20UE%20feedback%20NR%20ECID.docx) NR E-CID for UE feedback for on-demand PRS Nokia, Nokia Shanghai Bell discussion Rel-17 NR\_pos\_enh-Core

[R2-2108774](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2108774%20(8.11.4)%20Multiple%20QoS%20class%20using%20on-demand%20PRS%20%20.docx) Multiple QoS class using on-demand PRS Samsung Electronics discussion NR\_pos\_enh-Core

### 8.11.5 GNSS positioning integrity

Signalling, and procedures to support GNSS positioning integrity determination. This agenda item will utilise a summary document.

Including outcome of [Post114-e][601][POS] GNSS integrity assistance information, KPIs, and reporting of integrity results (Swift)

Email discussion summary

[R2-2107989](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107989%20-%20%5bPost114-e%5d%5b601%5d%5bPOS%5d%20GNSS%20Integrity_Summary.docx) Email Summary [Post114-e][601][POS] GNSS integrity assistance information, KPIs, and reporting of integrity results (Swift) Swift Navigation discussion

Easily Agreeable

Proposal 1: Agree that the GNSS feared events will be addressed in the WI.

Proposal 2: Agree that all A-GNSS positioning methods shall support positioning integrity determination in LPP.

Proposal 3: Agree that additional IEs are needed in LPP to support A-GNSS positioning integrity determination.

Proposal 4: The specific algorithms used for positioning integrity shall be up to implementation.

Proposal 5: For interoperability, the use of “hard-coded” parameters should be minimized and instead the needed parameters should be sent explicitly in the assistance data.

Proposal 6: RAN2 agrees that the PL will be reported in the Integrity Results. It is FFS whether Mode 2 and the TIR, AL, TTA that were used in the integrity calculation will also be reported in the integrity results.

Proposal 8: Agree that the UE feared events will be handled in the implementation for UE-based (network-assisted) methods of positioning integrity determination.

Proposal 10: Agree that the LMF feared events can be handled via implementation for the UE-based (network-assisted) and UE-assisted (LMF-based) methods of positioning integrity determination.

Proposal 11: RAN2 agrees to use Common Positioning IEs to transfer the KPIs and Integrity Results.

Proposal 12: RAN2 agrees that the LPP procedures can be used to transfer the KPIs and Integrity Results. For UE-assisted, the LCS procedures remain FFS in the case of MO-LR.

Discussion:

Qualcomm think P2 should say “positioning integrity is supported for all A-GNSS methods”, because we don’t modify the A-GNSS methods to support integrity.

vivo think the FFS in P6 should be removed. Swift think there were views on both sides of this issue and this was the reason for the FFS.

Agreements:

Proposal 1: Agree that the GNSS feared events will be addressed in the WI.

Proposal 2 (modified): Agree that all for A-GNSS positioning methods, positioning integrity determination is supported in LPP.

Proposal 3: Agree that additional IEs are needed in LPP to support A-GNSS positioning integrity determination.

Proposal 4: The specific algorithms used for positioning integrity shall be up to implementation.

Proposal 5: For interoperability, the use of “hard-coded” parameters should be minimized and instead the needed parameters should be sent explicitly in the assistance data.

Proposal 6: RAN2 agrees that the PL will be reported in the Integrity Results. It is FFS whether Mode 2 and the TIR, AL, TTA that were used in the integrity calculation will also be reported in the integrity results.

Proposal 8: Agree that the UE feared events will be handled in the implementation for UE-based (network-assisted) methods of positioning integrity determination.

Proposal 10: Agree that the LMF feared events can be handled via implementation for the UE-based (network-assisted) and UE-assisted (LMF-based) methods of positioning integrity determination.

Proposal 11: RAN2 agrees to use Common Positioning IEs to transfer the KPIs and Integrity Results.

Proposal 12: RAN2 agrees that the LPP procedures can be used to transfer the KPIs and Integrity Results. For UE-assisted, the LCS procedures remain FFS in the case of MO-LR.

May Require Further Discussion

Proposal 7: Agree that further study is needed to determine if the existing data integrity mechanisms in 3GPP are suitable for the purpose of positioning integrity.

Discussion:

Huawei doubt if we can conclude on this in the time available. They think we could assume that we do not consider this particular feared event.

Qualcomm agree with Huawei and think this could be a study on its own. They think we need to know the requirements in order to judge whether the existing mechanisms are sufficient.

Ericsson think there was a proposal in this direction and we could try for one more meeting.

Intel, Samsung, OPPO, Swift, Nokia, CATT agree that we should not do it in Rel-17.

Agreements:

In Rel-17, we do not address the data transmission feared event (i.e. we rely on the system’s existing methods for assuring data integrity).

Proposal 9: It is FFS whether the UE feared events are to be considered for the UE-assisted (LMF-based) methods of positioning integrity.

Summary document

[R2-2109029](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2109029_(Summary%20GNSS%20Integrity)_v2.docx) Summary on agenda item 8.11.5 on GNSS positioning integrity Qualcomm Incorporated discussion

Proposal 0: Study further the integrity information that can be detected by the UE in order to characterize the local environment "feared events",

Architectural issues:

Proposal 1: The support of GNSS integrity is enabled by using existing NG-RAN positioning architecture.

Proposal 2: Any additional functional elements, positioning/integrity modes, etc. should be introduced only when needed.

Discussion:

Qualcomm clarify that there were proposals introducing new entities and the intention is to exclude changing the architecture/terminology unless there is a need to change something.

ZTE agree with P1 and have a question for P2: does “only when needed” mean we would specify criteria for applying positioning integrity? Qualcomm clarify that the intention is that we should not define new elements/modes that we don’t need, e.g. we don’t need to specify an integrity computing function.

Agreements:

Proposal 1: The support of GNSS integrity is enabled by using existing NG-RAN positioning architecture.

Proposal 2: Any additional functional elements, positioning/integrity modes, etc. should be introduced only when needed.

Integrity procedures and LPP support:

Proposal 3: RAN2 to discuss and decide whether there is a need to define separate procedures for "A-GNSS Positioning Integrity" as proposed in R2-2107503 or whether the existing A-GNSS (and general location) Procedures are applicable/sufficient.

Proposal 4: RAN2 confirms that LPP messages RequestLocationInformation and ProvideProvideLocationInformation are used to transfer integrity results for GNSS positioning.

Proposal 5: RAN2 confirms that LPP messages RequestAssistanceData and ProvideAssistanceData are used to transfer integrity assistance data for GNSS positioning.

Discussion:

Qualcomm think that P4/P5 can be separated from P3. On P3, they understand that we do not need new procedures.

Huawei indicate the intention of proposing the stage 2 procedures was just to understand the detailed signalling and expose potential issues, e.g. the complexity of specifying the behaviour for LMF-based integrity.

Huawei wonder on P4 if the LMF would use Request Location Information to delivery integrity results to the UE. Qualcomm do not see a case where this is needed.

Huawei think we need to discuss whether we support the LMF-based case; they see a lot of work. Qualcomm think it may not even be possible. ESA do not see how to make it work either. Nokia think it is complex and wonder if we could agree now to deprioritise it.

vivo think P5 cannot support LMF-based.

ESA are OK to deprioritise LMF-based but think we should not block work on it completely.

OPPO think LMF-based could be used for UE power saving and prefer to keep it in scope for now.

Agreements:

Proposal 3 (modified): Separate procedures for "A-GNSS Positioning Integrity" as proposed in R2-2107503 will not be defined; the existing A-GNSS (and general location) Procedures are applicable/sufficient.

Proposal 4 (modified): RAN2 confirms that LPP messages RequestLocationInformation and ProvideLocationInformation are used to transfer integrity KPIs/results, respectively, for GNSS positioning at least for UE-based mode.

Proposal 5 (modified): RAN2 confirms that LPP messages RequestAssistanceData and ProvideAssistanceData are used to transfer integrity assistance data for GNSS positioning at least for UE-based mode.

LS to SA1:

Proposal 6: Send an LS to SA1 requesting them to study and evaluate any potential LCS Quality of Service aspects for positioning integrity support.

Assistance information:

Proposal 7: The assistance information that will be used to support integrity determination include at least quality indicators (standard deviation or variance) of the GNSS error sources.

NOTE: The GNSS error sources include at least satellite orbits/clock, signal code/phase bias, ionosphere and troposphere errors.

Proposal 8: Study further whether additional assistance information need to be supported. The additional assistance data may include:

- Mean values of the GNSS error sources.

- Information describing the time variation of the GNSS error sources.

- Probability of satellite fault.

- Probability of constellation fault.

- "Do Not Use" assistance data alerts

- "Do Not Use" SV and/or GNSS constellation alerts

NOTE: This does not preclude additional assistance data categories.

The following documents will not be individually treated

[R2-2107095](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107095%20Discussion%20on%20positioning%20integrity.docx) Discussion on positioning integrity ZTE discussion

[R2-2107136](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107136%20Discussion%20on%20Integrity%20KPIs%20impact%20and%20draft%20LS.docx) Discussion on Integrity KPIs impact and draft LS CATT discussion Rel-17 NR\_pos\_enh-Core

[R2-2107147](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107147_UE_Integrity_Fraunhofer_Ericsson_v2.0.docx) UE-aided detection of threat to GNSS systems and assistance data signaling Fraunhofer IIS; Fraunhofer HHI; Ericsson discussion R2-2105735

[R2-2107398](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Docs\R2-2107398.zip) Discussion on supporting positioing integrity in RAN OPPO discussion Rel-17 NR\_pos\_enh-Core

[R2-2107499](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107499%20Discussion%20on%20positioning%20integrity.docx) Discussion on positioning integrity Huawei, HiSilicon discussion Rel-17 NR\_pos\_enh-Core

[R2-2107503](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107503%20Text%20Proposal%20for%20GNSS%20integrity.docx) Text Proposal for GNSS integrity Huawei, HiSilicon discussion Rel-17 NR\_pos\_enh-Core

[R2-2107646](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107646%20Discussion%20on%20signalling%20and%20procedures%20for%20GNSS%20positioning%20integrity.docx) Discussion on signalling and procedures for GNSS positioning integrity vivo discussion Rel-17 NR\_pos\_enh-Core

[R2-2107688](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107688%20(R17%20NR%20POS%20WI%20AI8115_GNSS_Integrity).doc) Discussion on procedures and signalling for GNSS positioning integrity InterDigital, Inc. discussion Rel-17 NR\_pos\_enh

[R2-2108024](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2108024%20Positioning%20Integrity%20Support.docx) Positioning Integrity Support in LPP Nokia, Nokia Shanghai Bell discussion Rel-17 FS\_NR\_pos\_enh

[R2-2108176](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2108176%20Discussion%20on%20GNSS%20positioning%20integrity.doc) Discussion on GNSS positioning integrity Xiaomi discussion

[R2-2108340](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2108340%20Bounding%20GNSS%20errors%20for%20positioning%20integrity.docx) Bounding GNSS errors for positioning integrity ESA, Nokia, Nokia Shanghai Bell discussion Rel-17 FS\_NR\_pos\_enh

[R2-2108385](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2108385_(Integrity).docx) Considerations on GNSS positioning integrity support Qualcomm Incorporated discussion

[R2-2108396](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2108396%20GNSS%20Integrity.docx) GNSS positioning integrity Ericsson discussion R2-2105970

[R2-2108474](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2108474%20-%20Discussion%20on%20GNSS%20Integrity.docx) Discussion on GNSS Integrity Assistance Data Swift Navigation, Ericsson, Mitsubishi Electric Corporation discussion Rel-17

[R2-2108475](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2108475%20-%20TP%20on%20GNSS%20Integrity.docx) Text Proposal on GNSS Integrity Assistance Data Swift Navigation, Ericsson, Mitsubishi Electric Corporation discussion Rel-17

[R2-2108770](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2108770%20(8.11.5)%20Consideration%20on%20the%20signalling%20design%20for%20Positioning%20Integrity.docx) Consideration on the signalling design for Positioning Integrity Samsung Electronics discussion NR\_pos\_enh-Core

### 8.11.6 A-GNSS enhancements

Including support of BDS B2a and B3I signals and support of NavIC.

[R2-2107137](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107137.docx) Summary of Introduction of B3I signal in BDS system CATT, CAICT discussion Rel-17 NR\_pos\_enh-Core

Proposal 1: The global B3I signal in BDS should be supported in 3GPP both LTE and NR in Rel-17.

Proposal 2: RAN2 is kindly requested to agree CRs in [2] [3] [4].

[R2-2107138](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107138.docx) Introduction of B2a and B3I signal in BDS system in A-GNSS CATT, CAICT draftCR Rel-17 36.305 16.3.0 B NR\_pos\_enh-Core

[R2-2107139](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107139.DOCX) Introduction of B2a and B3I signal in BDS system in A-GNSS CATT, CAICT draftCR Rel-17 38.305 16.5.0 B NR\_pos\_enh-Core

[R2-2107140](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107140.docx) Introduction of B2a signal in BDS system in A-GNSS CATT, CAICT draftCR Rel-17 37.355 16.5.0 B NR\_pos\_enh-Core

[R2-2107141](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107141.docx) Introduction of B3I signal in BDS system in A-GNSS CATT, CAICT draftCR Rel-17 37.355 16.5.0 B NR\_pos\_enh-Core

Discussion:

Swift think some parameters were missing for B2a at the last meeting and wonder if it is addressed. CATT are not sure what was missing. Swift indicate there is an additional parameter for the group differential delay.

* CRs can be updated for next meeting.

[R2-2107990](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107990%20-%20BDS%20ephemeris.docx) Text proposal on BDS ephemeris (B2I) Swift Navigation discussion

* Can be submitted as TEI17

### 8.11.7 Other

Input on other WI objectives.

Positioning reference units

[R2-2107143](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107143.docx) Discussion on Positioning Reference Units (PRUs) for positioning enhancement CATT discussion Rel-17 NR\_pos\_enh-Core

[R2-2107357](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107357%20-%20Discussion%20on%20PRU%20of%20positioning.docx) Discussion on PRU of positioning Spreadtrum Communications discussion Rel-17

[R2-2107647](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107647%20Discussion%20on%20support%20for%20positioning%20reference%20unit.docx) Discussion on support for Positioning Reference Unit vivo discussion Rel-17 NR\_pos\_enh-Core

[R2-2107689](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107689%20(R17%20NR%20POS%20WI%20AI8117_PRU).doc) Discussion on supporting Positioning Reference Units InterDigital, Inc. discussion Rel-17 NR\_pos\_enh

[R2-2107831](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107831-%20Discussion%20on%20Positioning%20Reference%20Units%20(PRUs).doc) Discussion on the Positioning Reference Units (PRUs) OPPO discussion Rel-17 NR\_pos\_enh-Core

[R2-2108131](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2108131_PRUs_LenMM.docx) Support of Positioning Reference Units Lenovo, Motorola Mobility discussion Rel-17

[R2-2108386](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2108386_(Positioning%20Reference%20Units).docx) Signalling and Procedures for supporting Positioning Reference Units Qualcomm Incorporated discussion

[R2-2108398](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2108398%20PRU.docx) On the Positioning Reference Units aspects Ericsson discussion

Other

[R2-2107501](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2107501%20Discussion%20on%20positioning%20enhancement.docx) Discussion on positioning enhancement Huawei, HiSilicon discussion Rel-17 NR\_pos\_enh-Core

Positioning assistance data

Proposal 3: Support UE to include cell information (e.g., SCell and PSCell information) when requesting assistance data from LMF.

E-CID enhancement

Proposal 4: Incorporate RTT measurement for NR E-CID.

[R2-2108399](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202108%20-%20RAN2_115-e,%20Online\Extracts\R2-2108399%20High%20accuracy.docx) On high accuracy aspects Ericsson discussion

[Timing error groups]

Proposal 1 RAN2 to discuss representation of TEG in timing measurement reporting

Proposal 2 RAN2 to discuss representation of TEG in UL-SRS for positioning transmissions

Proposal 3 RAN2 to discuss enhancements to positioning capabilities, configuration and measurements to handle timing errors by enabling more positioning information to the positioning problem.

[DL-AoD/UL-AoA enhancements]

Proposal 4 Note the RAN1 LS and monitor related RAN3 work

Proposal 5 RAN2 to discuss representation of angular information per path as well as the supported number of additional paths

[Multipath/NLOS]

Proposal 6 RAN2 to discuss representation of further additional paths as well as richer information per path

# Post-Meeting Email Discussions

* [Post115-e][601][Relay] Relaying CR to 38.300 (MediaTek)

Scope: Update the CR with decisions of this meeting.

Intended outcome: Endorsed CR

Deadline: Short (not for RP)

* [Post115-e][602][Relay] Relaying CR to 38.304 (Ericsson)

Scope: Evaluate the draft CR and update with decisions of this meeting.

Intended outcome: Endorsable CR

Deadline: Long

* [Post115-e][603][Relay] Relaying CR to 38.331 (Huawei)

Scope: Evaluate the draft CR and update with decisions of this meeting.

Intended outcome: Endorsable CR

Deadline: Long

* [Post115-e][604][Relay] Relay QoS (Apple)

Scope: Address remaining proposals on QoS for L2 relay:

* PDB and PER split between Uu and PC5 (P3/P4 of R2-2109018)
* Configuration of remote and relay UE with PC5 QoS parameters (P3/P4/P5/P6/P9/P10 of R2-2109018)
* Granularity of QoS configuration for remote UE, per PC5 RLC bearer or per Uu QoS flow (P12/P13 of R2-2109018)
* Multiplexing of QoS flows of different PDU sessions and separation of relay traffic and relay UE’s own traffic (P14 of R2-2109018)
* RLC channel mapping in relation to QoS parameters (P15 of R2-2109018)
* Measurement reports on PC5 link conditions (P16 of R2-2109018)

Intended outcome: Report to next meeting

Deadline: Long

* [Post115-e][605][POS] Pre-configured assistance data (Intel)

Scope: Discuss signalling and validity criteria for pre-configured assistance data:

* Options for validity conditions:
  + Option A: Based on a validity area (e.g. a list of cells)
  + Option B: Based on a (configured) validity timer or a numerical limit on number of times it is utilized
  + Option C: Based on explicit modification or release from the LMF/NG-RAN
  + Option D: Based on the UE’s current location and/or the time
* Validity in relation to the duration of the positioning session
* Need for enhancements for signalling and use of pre-configured assistance data:
  + Add/mod/release mechanism for PRS configurations
  + Dynamic triggering of a preconfigured PRS at UE by LMF or gNB for making measurements on DL-PRS
  + Dynamic triggering of a preconfigured SRS at UE by gNB for transmitting SRS based on measurement report provided by UE
  + Priority indications for multiple (pre-)configured assistance data sets corresponding to multiple position fixes
* Stage 2 impact of pre-configured assistance data

Intended outcome: Report to next meeting

Deadline: Long

* [Post115-e][606][POS] MO-LR for on-demand PRS (CATT)

Scope: Determine whether UE-originated request of on-demand PRS is supported via MO-LR, including the case of a client at the UE, and determine what the impact would be to the procedure agreed as a stage 2 baseline in RAN2#115-e for on-demand PRS request.

Intended outcome: Report to next meeting

Deadline: Long

* [Post115-e][607][POS] Integrity assistance data (Huawei)

Scope: Discuss the supported assistance data for UE-based integrity determination, considering at least the following candidates that were proposed to RAN2#115-e:

* Quality indicators (standard deviation or variance) of the GNSS error sources
* Mean values of the GNSS error sources
* Information describing the time variation of the GNSS error sources
* Probability of satellite fault
* Probability of constellation fault
* “Do Not Use” assistance data alerts
* “Do Not Use” SV and/or GNSS constellation alerts

Assistance data can be considered in relation to the following categories of feared events from the TR:

* Feared events in the GNSS Assistance Data (category 1)
* GNSS feared events (category 3)
* LMF feared events (category 5)

Intended outcome: Report to next meeting

Deadline: Long

* [Post115-e][608][POS] PRS configuration and measurement in RRC\_INACTIVE (vivo)

Scope: Discuss the following potential configuration and measurement enhancements for DL-PRS in RRC\_INACTIVE (without exposing RRC state to LMF):

* Configuration enhancements:
  + RNA in the PRS configuration
  + Validity conditions in the PRS configuration
  + No impact to PRS configuration
* Assistance information from UE to gNB to help with configuration:
  + Type of reporting requested (e.g. periodic, aperiodic)
  + Payload size of LPP message
  + Start timing, measurement duration, reporting periodicity
  + No assistance information
* Measurement enhancements:
  + LMF/gNB interactions (for report size, periodicity, positioning requirements, data volume threshold)
  + Differential measurement report
  + No enhancements to measurement report

Deadline: Long

* [Post115-e][609][POS] RAT-dependent stage 2 CR (Intel)

Scope: Progress the CR to 38.300 for RAT-dependent positioning to reflect decisions up to this meeting.

Intended outcome: Endorsable CR

Deadline: Long

* [Post115-e][610][Relay] Control plane procedures (InterDigital)

Scope: Discuss open issues on the relay control plane:

* Paging
  + Parameters shared with relay UE for monitoring remote UE’s PO
  + PC5-RRC signalling to forward paging to relay without CSS
  + Forwarding of short message
* RNAU/TAU
  + Confirm if the remote UE performs TAU/RNAU based on relay UE’s serving cell (for IC or OOC remote UE, when PC5-RRC connected to the relay UE)
  + Determine if the relay UE can perform TAU/RNAU for the remote UE
* Control of access procedure
  + Whether relay UE indicates to the remote UE if an access attempt is rejected or fails (e.g. connection reject, UAC check failure)
  + Whether relay UE sends wait time to the remote UE, and if so how the remote UE handles it
  + Handling of T300 for remote UE, considering different RRC states of the relay UE

Intended outcome: Report to next meeting

Deadline: Long

* [Post115-e][611][Relay] Discovery shared/dedicated pool issue (Qualcomm)

Scope: Clarify from the UE perspective the terminology on the network configuration of dedicated discovery pool vs. shared pool for communication and discovery, and determine whether to support option 2 from discussion [AT115-e][617], in which the network configures both shared and dedicated pools.

Intended outcome: Report to next meeting

Deadline: Long

* [Post115-e][612][Relay] LS to SA3 on UE ID in adaptation layer (OPPO)

Scope: Draft an LS to SA3 informing them of our agreements on the local UE ID in the adaptation layer.

Intended outcome: Approved LS

Deadline: Short (not for RP)