3GPP TSG-RAN WG2 Meeting #114-e R2-21xxxxx

Online, 19-27 May 2021

Source: Session Chair (MediaTek)

Title: Report from session on positioning and sidelink relay

# 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.

* [AT114-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: Thursday 2021-05-27 1000 UTC

* [AT114-e][604][Relay] Summary on agenda item 8.7.4.1 on L2 relay control plane (vivo)

Scope: Discuss the proposals in R2-2106463 and progress toward consensus where possible.

Intended outcome: Report to comeback session, in R2-2106577

Deadline: 2021-05-25 1000 UTC

* [AT114-e][605][Relay] Summary on AI 8.7.4.2 on L2 relay service continuity (Samsung)

Scope: Discuss the proposals from R2-2106481 and progress toward consensus where possible.

Intended outcome: Report to comeback session, in R2-2106578

Deadline: 2021-05-25 1000 UTC

* [AT114-e][610][POS] Agenda item 4.4 on LTE positioning Rel-15 and earlier (Lenovo)

Scope: Handle the contributions to agenda item 4.4:

* Confirm agreement on the AIP CRs: R2-2104793/R2-2104794
* Discuss and conclude on new proposals: R2-2104800/R2-2104801, R2-2105209/R2-2105210/R2-2105211, R2-2106410
* Conclude handling of the 37.355 CRs related to R2-2106410: R2-2106411/R2-2106412 (note R2-2106411 should be category F, with a note linking it to R2-2106410)

Intended outcome: Agreed CRs, report in R2-2106579

Deadline: Tuesday 2021-05-25 1000 UTC

* [AT114-e][611][POS] Agenda item 5.5 on NR Rel-15 positioning (Huawei)

Scope: Discuss and conclude on the CRs in R2-2105052/R2-2105053.

Intended outcome: Agreed CRs, report in R2-2106580

Deadline: Tuesday 2021-05-25 1000 UTC

* [AT114-e][612][POS] Agenda item 7.5 on LTE Rel-16 positioning (Huawei)

Scope: Confirm agreement on the AIP CR in R2-2105047.

Intended outcome: Agreed CR

Deadline: Tuesday 2021-05-25 1000 UTC

* [AT114-e][613][POS] Rel-17 A-GNSS enhancements (CATT/Ericsson)

Scope: Discuss the draft CR in R2-2105143 and impact analysis in R2-2105972 and collect company inputs.

Intended outcome: Report in R2-2106581

Deadline: Thursday 2021-05-27 0000 UTC

* [AT114-e][614][POS] Remaining issues on LPP (Ericsson)

Scope: Discuss P1, P2, and P3 of R2-2106465. For P5, determine if UE behaviour for handling of expected RSTD in the broadcast case should be captured.

Intended outcome: Agreed CRs and report in R2-2106584

Deadline: Thursday 2021-05-27 0000 UTC

* [AT114-e][615][POS] UE capability for SRS activation MAC CE (CATT)

Scope: Determine if a UE capability is needed for support of the extension of positioning SRS resource ID in MAC, and if needed, evaluate the CRs in R2-2104798 and R2-2104799.

Intended outcome: Agreed CRs if necessary, and report in R2-2106585

Deadline: Thursday 2021-05-27 0000 UTC

* [AT114-e][616][POS] Stage 2 positioning CRs (Huawei)

Scope: Discuss and conclude on R2-2105055 and R2-2105967.

Intended outcome: Agreed CRs (by email without CB, if possible)

Deadline: Thursday 2021-05-27 0000 UTC

* [AT114-e][617][Relay] Open issues on discovery (OPPO)

Scope: Handle open issues on relay discovery:

* Discuss P1a/P2a/P2b of R2-2106457
* Discuss the case of no network configuration available in P3a of R2-2106457 (preconfiguration vs. no discovery)
* Conclude on dedicated resource pool for discovery
  + If supported, consider if there is impact to resource allocation
* Discuss fixed vs. configurable priority of discovery messages
* Discuss whether to deprioritise discovery gaps in Rel-17

Intended outcome: Report to CB session, in R2-2106586

Deadline: Tuesday 2021-05-25 1000 UTC (can extend if needed)

* [AT114-e][618][Relay] Remaining issues on (re)selection (CATT)

Scope: Resolve remaining open issues on relay (re)selection:

* Discuss the case of no data for evaluating the relay (re)selection trigger criterion, and determine whether a specified UE behaviour is needed, and if so what to specify
* Discuss P2 and P5 of R2-2106470

Intended outcome: Report to CB session, in R2-2106587

Deadline: Tuesday 2021-05-25 1000 UTC (can extend if needed)

* [AT114-e][620][POS] RRC state exposure for positioning (Huawei)

Scope: Discuss the possible need to specify having RRC state of the UE exposed to LPP layer in the UE and/or LMF.

Intended outcome: Report to CB session, in R2-2106588

Deadline: Thursday 2021-05-27 0000

* [AT114-e][621][POS] LS to RAN1 on UL positioning in RRC\_INACTIVE (Intel)

Scope: Confirm the need to send an LS to RAN1 to inform them of RAN2 agreements affecting UL positioning in RRC\_INACTIVE, and trigger the work on related open issues in RAN1.

Intended outcome: Agreeable LS

Deadline: Thursday 2021-05-27 0000 UTC

* [AT114-e][622][POS] LS to RAN3 on agreements for on-demand PRS (Ericsson)

Scope: Indicate to RAN3 our agreements on on-demand PRS and trigger them to take into account.

Intended outcome: Agreeable LS

Deadline: Thursday 2021-05-27 0000 UTC

* [AT114-e][623][POS] LS to RAN1 on parameters for on-demand PRS (Intel)

Scope: Draft an LS to RAN1 indicating the parameters from P5 of R2-2106467 as candidates for the on-demand DL-PRS request, and asking them to take a decision on the needed parameters.

Intended outcome: Agreeable LS

Deadline: Thursday 2021-05-27 0000 UTC

* [AT114-e][624][POS] LS to RTCM on GNSS integrity (ESA)

Scope: Draft an LS to RTCM informing them of our agreements on GNSS integrity and soliciting their input.

Intended outcome: Agreeable LS

Deadline: Thursday 2021-05-27 0000 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.

* [AT114-e][610][POS] Agenda item 4.4 on LTE positioning Rel-15 and earlier (Lenovo)

Scope: Handle the contributions to agenda item 4.4:

* Confirm agreement on the AIP CRs: R2-2104793/R2-2104794
* Discuss and conclude on new proposals: R2-2104800/R2-2104801, R2-2105209/R2-2105210/R2-2105211, R2-2106410
* Conclude handling of the 37.355 CRs related to R2-2106410: R2-2106411/R2-2106412 (note R2-2106411 should be category F, with a note linking it to R2-2106410)

Intended outcome: Agreed CRs, report in R2-2106579

Deadline: Tuesday 2021-05-25 1000 UTC

R2-2106579 Report from email discussion [AT114-e][610][POS] Agenda item 4.4 on LTE positioning Rel-15 and earlier (Lenovo) Lenovo discussion Rel-15

In-principle-agreed CRs

[R2-2104793](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\36331_CR4611r2_(Rel-15)_R2-2104793.docx) Corrections on the acquisition of a posSI message CATT CR Rel-15 36.331 15.13.0 4611 2 F LCS\_LTE\_acc\_enh-Core R2-2104518

[R2-2104794](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\36331_CR4612r2_(Rel-16)_R2-2104794.docx) Corrections on the acquisition of a posSI message CATT CR Rel-16 36.331 16.4.0 4612 2 A LCS\_LTE\_acc\_enh-Core R2-2104519

Other

[R2-2104800](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\36331_CR4652_(Rel-15)_R2-2104800.docx) Corrections on the acquisition of a posSI message by BL UE or UE in CE CATT CR Rel-15 36.331 15.13.0 4652 - F LCS\_LTE\_acc\_enh-Core

[R2-2104801](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\36331_CR4653_(Rel-16)_R2-2104801.docx) Corrections on the acquisition of a posSI message by BL UE or UE in CE CATT CR Rel-16 36.331 16.4.0 4653 - A LCS\_LTE\_acc\_enh-Core

[R2-2105209](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\36331_CR4656_(Rel-15)_R2-2105209_PosSI_corrections.docx) Corrections to Positioning SI message scheduling for eMTC and NB-IoT Lenovo, Motorola Mobility CR Rel-15 36.331 15.13.0 4656 - F LCS\_LTE\_acc\_enh-Core

[R2-2105210](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\36331_CR4657_(Rel-16)_R2-2105210_PosSI_corrections.docx) Corrections to Positioning SI message scheduling for eMTC and NB-IoT Lenovo, Motorola Mobility CR Rel-16 36.331 16.4.0 4657 - A LCS\_LTE\_acc\_enh-Core

[R2-2105211](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2105211_PosSI_scheduling_for_eMTC.doc) Positioning SI message scheduling for eMTC Lenovo, Motorola Mobility discussion Rel-15 LCS\_LTE\_acc\_enh-Core

[R2-2106410](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2106410.docx) Clarification on endTransaction field Samsung CR Rel-14 36.355 14.7.0 0257 - F TEI14

Withdrawn/Not available

R2-2106405 Clarification on endTransaction field Samsung discussion Rel-14 36.355 TEI14 Withdrawn

# 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.

* [AT114-e][611][POS] Agenda item 5.5 on NR Rel-15 positioning (Huawei)

Scope: Discuss and conclude on the CRs in R2-2105052/R2-2105053.

Intended outcome: Agreed CRs, report in R2-2106580

Deadline: Tuesday 2021-05-25 1000 UTC

R2-2106580 [AT114-e][611][POS] Agenda Item 5.5 on NR Rel-15 positioning (Huawei) Huawei discussion Rel-15

CRs

[R2-2105052](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2105052%20Correction%20to%20E-CID-R15.doc) Correction to E-CID-R15 Huawei, HiSilicon CR Rel-15 38.305 15.8.0 0063 1 F NR\_newRAT-Core R2-2101816

[R2-2105053](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2105053%20Correction%20to%20E-CID-R16.doc) Correction to E-CID-R16 Huawei, HiSilicon CR Rel-16 38.305 16.4.0 0064 1 F NR\_pos-Core R2-2101817

Shadow CR of Rel-14 proposal

[R2-2106411](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2106411.docx) Clarification on endTransaction field Samsung CR Rel-15 37.355 15.1.0 0309 - A TEI14

Withdrawn/Not available

R2-2106406 Clarification on endTransaction field Samsung discussion Rel-15 37.355 TEI14 Withdrawn

# 6 Rel-16 NR Work Items

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

Tdoc Limitation: 30 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: 7 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).

In-principle-agreed CRs

[R2-2105044](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2105044%20Correction%20to%205G%20support%20for%20NB-IOT%20positioning.doc) Correction to 5G support for NB-IOT positioning Huawei, HiSilicon CR Rel-16 38.305 16.4.0 0069 3 F TEI16 R2-2104407

[R2-2105048](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2105048%20Correction%20to%20NR%20stage2%20spec%20for%20MO-LR.DOC) Correction to NR stage2 spec for MO-LR Huawei, HiSilicon CR Rel-16 38.305 16.4.0 0072 2 F NR\_pos-Core R2-2104527

Other

[R2-2105055](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2105055%20Correction%20to%20NRPPa%20PDU%20transfer%20for%20uplink%20positioning.doc) Correction to NRPPa PDU transfer for uplink positioning Huawei, HiSilicon CR Rel-16 38.305 16.4.0 0073 - F NR\_pos-Core

[R2-2105967](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2105967%20CR%20Stage2.docx) Addition of missing parameters for the SRS spatial information Ericsson CR Rel-16 38.305 16.4.0 0074 - F NR\_pos-Core

* [AT114-e][616][POS] Stage 2 positioning CRs (Huawei)

Scope: Discuss and conclude on R2-2105055 and R2-2105967.

Intended outcome: Agreed CRs (by email without CB, if possible)

Deadline: Thursday 2021-05-27 0000 UTC

### 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).

In-principle-agreed CRs

[R2-2104795](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\38331_CR2490r2_(Rel-16)_R2-2104795.docx) Corrections on the description of SRS-Config CATT CR Rel-16 38.331 16.4.1 2490 2 F NR\_pos-Core R2-2104408

* Agreed

[R2-2105975](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2105975%20offset%20CR.docx) Correction for the positioning SI offset and clarification on mapping of posSIB to SI Ericsson, Apple CR Rel-16 38.331 16.4.1 2574 1 F NR\_pos-Core R2-2104410

* Agreed

### 6.3.3 LPP corrections

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

In-principle-agreed CRs

[R2-2104796](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\37355_CR0294r2_(Rel-16)_R2-2104796.docx) Miscellaneous corrections on the field description CATT, Ericsson, ZTE CR Rel-16 37.355 16.4.0 0294 2 F NR\_pos-Core R2-2104520

* Agreed

[R2-2105045](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2105045%20Correction%20to%20need%20code%20for%20DL%20LPP%20message-R15.doc) Correction to need code for DL LPP message-R15 Huawei, HiSilicon, Lenovo CR Rel-15 37.355 15.1.0 0298 2 F NR\_newRAT-Core, LCS\_LTE\_acc\_enh-Core R2-2104524

* Agreed

[R2-2105046](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2105046%20Correction%20to%20need%20code%20for%20DL%20LPP%20message-R16.doc) Correction to need code for DL LPP message-R16 Huawei, HiSilicon, Lenovo CR Rel-16 37.355 16.4.0 0292 3 F NR\_pos-Core, NR\_newRAT-Core, LCS\_LTE\_acc\_enh-Core R2-2104525

* Agreed

[R2-2105049](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2105049%20Correction%20to%20PRS%20configuration.doc) Correction to PRS configuration Huawei, HiSilicon CR Rel-16 37.355 16.4.0 0300 2 F NR\_pos-Core R2-2104565

* Agreed

[R2-2105050](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2105050%20Correction%20to%20the%20uplink%20LPP%20message.doc) Correction to the uplink LPP message Huawei, HiSilicon CR Rel-16 37.355 16.4.0 0301 2 F NR\_pos-Core R2-2104566

* Agreed

[R2-2105051](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2105051%20Correction%20to%20DL-PRS%20capability.doc) Correction to DL-PRS capability Huawei, HiSilicon CR Rel-16 37.355 16.4.0 0302 2 F NR\_pos-Core R2-2104567

Lenovo point out there is a wrong IE name in the first change: there is no NR-DL-PRS-ProcessingCapabilityPerBand. Should be changed to PRS-ProcessingCapabilityPerBand.

* Agreed with this change as R2-2106582

[R2-2105976](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2105976%20layer%20Interaction.docx) LPP Layer interaction with lower layers for Positioning Frequency layer and Measurement Gap Ericsson CR Rel-16 37.355 16.4.0 0288 4 F NR\_pos-Core R2-2104575

* Agreed

Summary document

[R2-2106465](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2106465%20LPP.docx) Summary for LPP Corrections for Positioning Ericsson discussion Rel-16 NR\_pos-Core

Proposal 1 RAN2 to agree to convert draft CR R2-2104842 to normal CR and clarify that the timestamp in measurement reporting is associated with nr-DL-PRS-ReferenceInfo.

Proposal 2 RAN2 to discuss CR R2-2105054 and decide if PRS-only TP applicability explicitly needs to be clarified in LPP specification.

Proposal 3 RAN2 to discuss if update of field description of nr-ARFCN and corresponding reference is needed or not.

Proposal 4 RAN2 to discuss whether clarification on “UE to send multiple PFL at the same time is not limited by UE capability to perform measurement of one PFL at a time” is needed or not.

Proposal 5 RAN2 to discuss whether expectedRSTD and expectedRSTD-Uncertainty is OPTIONAL for broadcast and NBC change is to be done or not.

Discussion:

P1:

Nokia think we discussed this previously and agreed not to pursue it. vivo understand that we agreed it was only applicable to DL-TDOA and the CR is consistent with that.

Qualcomm think the CR is in line with the RAN1 specification in principle, but the proposed text is not clear, and the coversheet should indicate that this is an alignment CR rather than a clarification.

Ericsson think this can be done as an easy one-liner without including the field names.

* Email

P2:

Ericsson think we have already captured what the TP is in stage 2 and NRPPa, so this may not be needed.

Qualcomm think the clarification for PRS-only TP is useful to have, but we should do it in the same way as LTE. The CR as written makes the PCI mandatory in the cell ID in the assistance data; it can be done with a simple flag. They also think the requirement on the UE to include the cell ID does not work since the UE does not routinely decode SIB1 for neighbour cells, and copying the CGI from the assistance data does not work to disambiguate the report.

Nokia point out the fields are Need ON and so no UE behaviour may be needed. They understand that we have a definition of PRS-only TP in the definitions.

Qualcomm clarify that the indication to the UE that the AD is for a PRS-only TP is useful. We have this flag in LTE and it would be similarly useful in NR.

Huawei confirm that the definition is there in stage 2, but they think it is needed also from the stage 3 perspective. On Qualcomm’s comment about copying the CGI, they think this can be done since the CGI is used to differentiate cells. Qualcomm understand that there is no value in copying it from the assistance data and it would make sense to include the DL-PRS-Id or an index into the AD list. Huawei think the UE could obtain CGI from the SI of the reported cell.

Intel understand that the intention of the CR is for the PRS-only TP, and the reporting of CGI is separate from this; the CGI appears also outside the timestamp IE. Their understanding is that the UE can report the CGI if available, otherwise PCI+ARFCN, and the UE implementation can determine what is available.

Ericsson think an ASN.1 change can be avoided and the PRS-only TP is already clear from the options in the cell ID.

* Email

P3:

Qualcomm understand that there is some ambiguity in the ARFCN, but think the CR does not really clarify it. They think the root of the problem is from removing the TRP ID. The cell can be identified by CGI or by PCI+ARFCN, and the ARFCN should be the frequency of the CD-SSB. They think this is indicated in 38.300 where the CD-SSB is discussed.

Huawei wonder about the case of the PRS-only TP. Qualcomm agree there is ambiguity and the field can be excluded for a PRS-only TP.

* Email

P4:

Qualcomm checked with RAN4 colleagues and think the described behaviour is not possible in Rel-16; there will not be a way of configuring a gap applicable to multiple PFLs. They also think it is misplaced in LPP, and last meeting we left the issue to UE implementation.

Nokia think this is not a critical clarification. Chair asks if there is system behaviour that would be implied by the change.

Ericsson think it clarifies how the UE requesting multiple PFLs should be handled, and they understand from RAN4 colleagues that this is possible.

* R2-2105962 is not pursued

P5:

Qualcomm think the cell ID from which you broadcast the assistance data defines the expected RSTD. We have the expected RSTD in broadcast in LTE, and they understand the implied assumption is that the approximate UE location is the location of the cell. So they think it is still applicable for broadcast.

Huawei think the intention of the CR is that the search window is not applicable for broadcast, and they think this is wrong as indicated by Qualcomm. They also note the CR is highly NBC due to changing the parsing of the LPP message.

Ericsson think the definition of the expected RSTD implies that the network would have some advance knowledge of the UE location, e.g. RTD. They think we should at least capture that the behaviour is different for broadcast. Fraunhofer agree with Ericsson and think if we do not have the optionality it should be possible for unicast AD to override the broadcast.

Intel agree with Qualcomm that the uncertainty can be estimated in the broadcast case.

vivo wonder what the UE should do with the expected RSTD in the broadcast case since it is not estimated in real time. Qualcomm think real time is not an issue since the AD are valid for the cell, and there is no difference between the UE behaviour in point-to-point and broadcast.

* Avoid taking an NBC change
* Email to determine if some UE behaviour for the broadcast case should be captured
* [AT114-e][614][POS] Remaining issues on LPP (Ericsson)

Scope: Discuss P1, P2, and P3 of R2-2106465. For P5, determine if UE behaviour for handling of expected RSTD in the broadcast case should be captured.

Intended outcome: Agreed CRs and report in R2-2106584

Deadline: Thursday 2021-05-27 0000 UTC

R2-2106584 [AT114-e][614][POS] Remaining issues on LPP (Ericsson) Ericsson discussion Rel-16 NR\_pos-Core

The following documents will not be individually treated

[R2-2104842](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2104842%20Draft%20CR%20on%20timestamp%20reference%20in%20NR%20positioning%20measurement%20report.docx) 37.355 Draft CR on timestamp reference in NR positioning measurement report vivo draftCR Rel-16 37.355 16.4.0 NR\_pos-Core

[R2-2105054](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2105054%20Correction%20to%20PRS-only%20TP%20v01.doc) Correction to PRS-only TP Huawei, HiSilicon CR Rel-16 37.355 16.4.0 0305 - F NR\_pos-Core

[R2-2105056](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2105056%20Correction%20to%20NR-ARFCN%20of%20the%20TRP.doc) Correction to NR-ARFCN of the TRP Huawei, HiSilicon CR Rel-16 37.355 16.4.0 0306 - F NR\_pos-Core

* Revised in R2-2106589

R2-2106589 Correction to NR-ARFCN of the TRP Huawei, HiSilicon CR Rel-16 37.355 16.4.0 0306 1 F NR\_pos-Core

[R2-2105962](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2105962%20PFL.docx) Clarification on UE Signaling and measurements of DL-PRS for multiple Positioning Frequency Layers Ericsson CR Rel-16 37.355 16.4.0 0307 - F NR\_pos-Core

* Not pursued

[R2-2105963](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2105963%20ExpectedRSTD.docx) Correction of Expected RSTD to reflect Optional Presence for Broadcast Ericsson, Fraunhofer IIS, Fraunhofer HHI CR Rel-16 37.355 16.4.0 0308 - F NR\_pos-Core

Shadow CR of Rel-14 proposal

[R2-2106412](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2106412.docx) Clarification on endTransaction field Samsung CR Rel-16 37.355 16.4.0 0310 - A TEI14

Withdrawn/Not available

R2-2106407 Clarification on endTransaction field Samsung discussion Rel-16 37.355 TEI14 Withdrawn

### 6.3.4 MAC corrections

[R2-2104797](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\38321_CR1072r3_(Rel-16)_R2-2104797.docx) Corrections on SP Positioning SRS Activation and Deactivation MAC CE CATT CR Rel-16 38.321 16.4.0 1072 3 F NR\_pos-Core R2-2104412

CATT think the coversheet needs some polishing (interoperability description).

* Agreed with interoperability revision in the coversheet, as R2-2106583

[R2-2104798](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\38306_CR0572r1_(Rel-16)_R2-2104798.docx) Corrections on the UE capability of indication on supporting the extension of Positioning SRSresourceID CATT CR Rel-16 38.306 16.4.0 0572 1 F NR\_pos-Core R2-2104417

[R2-2104799](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\38331_CR2580r1_(Rel-16)_R2-2104799.docx) Corrections on the UE capability of indication on supporting the extension of Positioning SRSresourceID CATT CR Rel-16 38.331 16.4.1 2580 1 F NR\_pos-Core R2-2104418

Nokia think it would be good to have the UE capability so the network knows if it can use the extended range.

Qualcomm think a capability makes sense from a spec cleanliness pov. They understand there are no implementations in the field, but we chose to use a BC solution with the reserved bit and it would be more consistent to have the capability.

Ericsson think we could have taken the NBC MAC solution, but since we didn’t, a clean solution may be better.

Huawei are neutral on the preferred MAC approach, but think the capability is not needed. UE capability is not free since there is signalling impact.

* [AT114-e][615][POS] UE capability for SRS activation MAC CE (CATT)

Scope: Determine if a UE capability is needed for support of the extension of positioning SRS resource ID in MAC, and if needed, evaluate the CRs in R2-2104798 and R2-2104799.

Intended outcome: Agreed CRs if necessary, and report in R2-2106585

Deadline: Thursday 2021-05-27 0000 UTC

R2-2106585 Report of[AT114-e][615][POS] UE capability for SRS activation MAC CE (CATT) CATT discussion Rel-16 NR\_pos-Core

[R2-2105966](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2105966%20view%20on%20MAC%20CE.docx) "View on Correction for SP Positioning SRS Activation and Deactivation MAC CE" Ericsson discussion Rel-16 38.321

# 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.

* [AT114-e][612][POS] Agenda item 7.5 on LTE Rel-16 positioning (Huawei)

Scope: Confirm agreement on the AIP CR in R2-2105047.

Intended outcome: Agreed CR

Deadline: Tuesday 2021-05-25 1000 UTC

In-principle-agreed CRs

[R2-2105047](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2105047%20Correction%20to%20LTE%20stage2%20spec%20for%20MO-LR.DOC) Correction to LTE stage2 spec for MO-LR Huawei, HiSilicon CR Rel-16 36.305 16.2.0 0104 2 F TEI16, LCS\_LTE R2-2104526

# 8 Rel-17 NR Work Items

## 8.7 NR sidelink relay

(NR\_SL\_Relay-Core; leading WG: RAN2; REL-17; WID: RP-210904)

Time budget: 1 TU

Tdoc Limitation: 4 tdocs

Email max expectation: 4 threads

Focus for this meeting: Conclude stage 2 issues for the common topics on relay discovery and re/selection. L2 relay specific topics will be treated at lower priority.

### 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.

[R2-2104837](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2104837%20-%20Work%20planning%20for%20R17%20SL%20relay.docx) Work planning for R17 SL relay OPPO, CMCC Work Plan Rel-17 NR\_SL\_relay-Core

* Noted

[R2-2104945](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2104945%20Running%20CR%20on%20Introduction%20of%20Rel-17%20Sidelink%20Relay.docx) Running CR on Introduction of Rel-17 Sidelink Relay MediaTek Inc. discussion Rel-17

Chair understands the CR will need to be upated for this meeting.

* Noted (to be updated with decisions of this meeting)

### 8.7.2 Relay discovery

Re-using LTE discovery as baseline.

Summary document

[R2-2106457](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2106457%20Summary%20of%208.7.2.DOCX) Summary of 8.7.2 OPPO discussion Rel-17 NR\_SL\_relay-Core

[Prioritized to be agreed:]

Proposal 1b: RAN2 agree that for relay/remote UE in RRC IDLE/INACTIVE state, in-coverage on the serving frequency, and the serving frequency is not shared with concerned frequency, if the configuration of concerned SL frequency is absent within the SIB of the serving frequency or if there is no discovery related SIB on the serving frequency

- If there is Uu deployed at the concerned SL frequency, UE shall 1) rely on the discovery related SIB, if any broadcasted in the concerned SL frequency; Or 2) if there is no discovery related SIB on the concerned SL frequency, UE does not perform SL discovery transmission/reception on the concerned frequency.

- If there is no Uu deployed at the concerned frequency, UE shall rely on pre-configuration.

Proposal 1c: RAN2 agree that for relay/remote UE in RRC IDLE/INACTIVE state, in-coverage on the serving frequency，if the serving frequency is shared with concerned SL frequency

- If there is no discovery related SIB broadcasted on the serving carrier, UE does not perform SL discovery transmission/reception on the concerned frequency.

Proposal 3a: RAN2 agree that for L2 remote UE which is out-of-coverage, but connected to network via a relay UE (i.e., either in RRC CONNECTED or RRC IDLE/INACTIVE), it should follow network configuration, i.e., SIB or dedicated signalling, if available; Otherwise, it uses pre-configured SL discovery configuration.

Proposal 3b: RAN2 confirm for L2 remote UE which is out-of-coverage, and has not connected to network directly or via a relay UE (i.e., neither RRC\_CONNECTED nor RRC\_IDLE/INACTIVE), it can rely on pre-configuration.

Proposal 4: RAN2 agree that for L3 remote UE which is out-of-coverage, and has not connected to network directly or via a relay UE (i.e., neither RRC\_CONNECTED nor RRC\_IDLE/INACTIVE), it should follow pre-configuration.

Proposal 6: RAN2 agrees to reuse Rel-16 power control mechanism for transmission of discovery messages.

Proposal 8: The same PDCP data PDU format as SL-SRB0 is used for sidelink discovery message (SL-SRB4), and the SDU type field is not used for SL-SRB4.

Proposal 9: RAN2 agrees to postpone the discussion related to resource allocation since there is nothing particularly related to relay discovery.

Proposal 10: RAN2 to postpone the issue on network capability differentiation to stage 3 ASN.1 discussion.

Proposal 11: RAN2 rely on SA2 on the L2 ID design for discovery message. No LS is needed.

[Prioritized to be discussed:]

Proposal 1a: RAN2 agree that for relay/remote UE in RRC IDLE/INACTIVE state, and in-coverage on the serving frequency:

- If there is discovery related SIB broadcasted on the serving frequency, and if the configuration of concerned SL frequency is included within the SIB of the serving frequency but the Tx resource pool configuration is absent, UE shall enter RRC CONNECTED state to acquire dedicated configuration on Tx resource pool.

Proposal 2a: RAN2 agree that RRC\_CONNECTED relay/remote UE which are in-coverage on the serving frequency, if there is discovery related SIB broadcasted on the serving frequency, and if the configuration of concerned SL frequency is included within the SIB of the serving frequency, it can only use the SL discovery Tx resource configuration provided by dedicated signalling if provided, or not transmit discovery if it is not provided.

Proposal 2b: RAN2 agree that RRC\_CONNECTED L3 relay/remote UE which are in-coverage on the serving frequency, and the serving frequency is not shared with concerned frequency, if the configuration of concerned SL frequency is absent within the SIB of the serving frequency or if there is no discovery related SIB on the serving frequency, follow the behaviour for RRC IDLE/INACTIVE in this case (i.e., P1b).

Proposal 5: RAN2 discuss whether to support dedicated discovery resource pool besides shared resource pool configuration.

Proposal 7: RAN2 discuss on how to configure the priority of sidelink discovery message.

[Deprioritized:]

Proposal 12: De-prioritize support of discovery gaps in Rel-17.

Proposal 13: De-prioritize additional condition for discovery transmission/reception in Rel-17.

Discussion:

OPPO note that P3b and P4 have been somewhat updated in offline discussion, to remove the wording “has not connected to network directly or via a relay UE” and the brackets. MediaTek thought the previous wording was more clear and find the state language unclear.

Xiaomi think the new wording makes more sense, and note that P1b and P2b address the working assumption from last meeting.

Lenovo think we could talk about “out of coverage with respect to the overlay network”.

Ericsson think these are in line with agreements from the SI phase already. The TR indicates that the OOC UE can at least rely on preconfiguration.

OPPO think the language from the SI covered the case that the UE has not connected via a relay UE.

LG have a concern with P3a in the case that the network does not provide discovery configuration. In this case they think the L2 remote UE should not do discovery. Ericsson have some sympathy and think if the network does not provide a discovery configuration, the remote UE anyway cannot achieve the connection via a relay, so the “if available” condition may be meaningless. OPPO understand that if the configuration is not provided, the UE must either not perform discovery or use preconfiguration, and if the remote UE does not perform discovery, it will cause the result as mentioned by Ericsson: The remote UE will not have any discovery configuration. For OOC case, OPPO think the network does not need the power to suppress discovery for the remote UE.

Ericsson have a concern with P1b and wonder how a connection to the network can be set up in the last case (no Uu deployed at the concerned frequency). Chair understands “concerned” refers to the sidelink frequency which could be different from the Uu frequency. OPPO confirm this understanding. Apple have the same view.

InterDigital have a concern with the wording of P9. For the second part, they are not sure if there will be impacts due to the support of dedicated resource pool for discovery. Huawei think we could indicate RAN2 assume there is no specific impact for discovery, and if there is later impact from the dedicated resource pool we can revisit it.

* Email for P1a/P2a/P2b

P5:

OPPO think this could be left to network implementation: Support the separate pool in the spec and the network can decide whether to use it. CATT have the same view; also Qualcomm.

Qualcomm understand that the SI concluded we could support the separate resource pool if no blocking issue is identified.

Ericsson think the shared resource pool is enough and we should not have an enhancement on top of it.

Apple wonder if the network would label a certain resource pool for discovery and it would mean other pools could not be used for discovery. They do not have a strong objection to the separate pool but want clear UE behaviour.

Intel agree with Ericsson and wonder if we can take this decision without involving RAN1.

Huawei suggest we deprioritise the discussion of this topic, and assume the separate pool as a baseline but reserve the right to drop it if there is a problem.

Show of hands: (1) support dedicated resource pool for discovery, (2) common pool only.

1. 13 hands
2. 6 hands

* Email for final discussions of P5. Scope is just to determine if there is a clear consensus that we can support it.

P7:

Chair asks if companies can accept a fixed priority. Ericsson would not be OK with this. InterDigital have some sympathy with Ericsson and think typically we would allow the network to configure it.

Lenovo point out in the SI we agreed the LCID is applied to the dedicated resource pool.

Intel agree with Ericsson.

* Email for P7

P12:

* Email for P12

Agreements:

Proposal 3b (modified): RAN2 confirm the SI conclusion that for L2 remote UE which is out-of-coverage, and is neither in RRC\_CONNECTED nor RRC\_IDLE/INACTIVE, it can rely on pre-configuration.

Proposal 4 (modified): RAN2 confirm the SI conclusion that for L3 remote UE which is out-of-coverage, and is neither in RRC\_CONNECTED nor RRC\_IDLE/INACTIVE, it should follow pre-configuration.

Proposal 3a (modified): RAN2 agree that for L2 remote UE which is out-of-coverage, but connected to network via a relay UE (i.e., either in RRC CONNECTED or RRC IDLE/INACTIVE), it should follow network configuration, i.e., SIB or dedicated signalling, if available.

Proposal 1b: RAN2 agree that for relay/remote UE in RRC IDLE/INACTIVE state, in-coverage on the serving frequency, and the serving frequency is not shared with concerned frequency, if the configuration of concerned SL frequency is absent within the SIB of the serving frequency or if there is no discovery related SIB on the serving frequency

- If there is Uu ~~deployed~~coverage at the concerned SL frequency, UE shall 1) rely on the discovery related SIB, if any broadcasted in the concerned SL frequency; Or 2) if there is no discovery related SIB on the concerned SL frequency, UE does not perform SL discovery transmission/reception on the concerned frequency.

- If there is no Uu ~~deployed~~coverage at the concerned frequency, UE shall rely on pre-configuration.

Proposal 1c: RAN2 agree that for relay/remote UE in RRC IDLE/INACTIVE state, in-coverage on the serving frequency，if the serving frequency is shared with concerned SL frequency

- If there is no discovery related SIB broadcasted on the serving carrier, UE does not perform SL discovery transmission/reception on the concerned frequency.

Proposal 6: RAN2 agrees to reuse Rel-16 power control mechanism for transmission of discovery messages.

Proposal 8: The same PDCP data PDU format as SL-SRB0 is used for sidelink discovery message (SL-SRB4), and the SDU type field is not used for SL-SRB4.

Proposal 9: RAN2 agrees to postpone the discussion related to resource allocation to after RAN#92-e. [FFS if impact from dedicated resource pool; to be revisited this meeting.]

Proposal 10: RAN2 to postpone the issue on network capability differentiation to stage 3 ASN.1 discussion.

Proposal 11: RAN2 rely on SA2 on the L2 ID design for discovery message. No LS is needed.

Proposal 13: De-prioritize additional condition for discovery transmission/reception in Rel-17.

NOTE: Proposal 1b was edited after agreement to change “deployed” to “coverage”.

Proposal 3a (modified): RAN2 agree that for L2 remote UE which is out-of-coverage, but connected to network via a relay UE (i.e., either in RRC CONNECTED or RRC IDLE/INACTIVE), it should follow network configuration, i.e., SIB or dedicated signalling, if available; [Otherwise, it uses pre-configured SL discovery configuration.]

* [AT114-e][617][Relay] Open issues on discovery (OPPO)

Scope: Handle open issues on relay discovery:

* Discuss P1a/P2a/P2b of R2-2106457
* Discuss the case of no network configuration available in P3a of R2-2106457 (preconfiguration vs. no discovery)
* Conclude on dedicated resource pool for discovery
  + If supported, consider if there is impact to resource allocation
* Discuss fixed vs. configurable priority of discovery messages
* Discuss whether to deprioritise discovery gaps in Rel-17

Intended outcome: Report to CB session, in R2-2106586

Deadline: Tuesday 2021-05-25 1000 UTC (can extend if needed)

[R2-2106586](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2106586%20-%20offline%20discussion%20617.docx) Offline discussion xxx OPPO discussion Rel-16 NR\_SL\_relay-Core

[Easy]:

Proposal 1 [easy]: RAN2 agrees that for relay/remote UE in RRC IDLE/INACTIVE state, and in-coverage on the serving frequency, if there is discovery related SIB broadcasted on the serving frequency, and if the configuration of concerned SL frequency is included within the SIB of the serving frequency but the Tx resource pool configuration is absent, UE shall enter RRC CONNECTED state to acquire dedicated configuration on Tx resource pool.

Proposal 2 [easy]: RAN2 agree that RRC\_CONNECTED relay/remote UE which are in-coverage on the serving frequency, if there is discovery related SIB broadcasted on the serving frequency, and if the configuration of concerned SL frequency is included within the SIB of the serving frequency, it can only use the SL discovery Tx resource configuration provided by dedicated signalling if provided, or not transmit discovery if not provided.

Proposal 3a [easy]: RAN2 agree that RRC\_CONNECTED L3 relay/remote UE or layer 2 remote UE which are in-coverage on the serving frequency, and the serving frequency is not shared with concerned frequency, if the configuration of concerned SL frequency is absent within the SIB of the serving frequency or if there is no discovery related SIB on the serving frequency,

- If there is Uu coverage at the concerned SL frequency, UE shall 1) rely on the discovery related SIB, if any broadcasted in the concerned SL frequency; Or 2) if there is no discovery related SIB on the concerned SL frequency, UE does not perform SL discovery transmission/reception on the concerned frequency.

- If there is no Uu coverage at the concerned frequency, UE shall rely on pre-configuration.

Proposal 4a [easy]: RAN2 agree that for L2 remote UE which is out-of-coverage, but connected to network via a relay UE and in RRC IDLE/INACTIVE state, if the network configuration is not available, i.e., SIB, remote UE shall rely on pre-configuration to perform discovery.

Proposal 5 [easy]: RAN2 agrees to down-prioritize discovery specific resource allocation optimization in this release.

Proposal 9 [easy]: RAN2 agrees to down-prioritize the support of discovery gaps in this release.

* Block of proposals above is agreed

[Discuss]

Proposal 3b [discussion]: RAN2 revise the previously agreed P1b to change “deployed” to “coverage”.

* Agreed (reflected in P1b above)

Proposal 3c [discussion]: RAN2 confirm P3a is also applicable to L2 remote UE.

* Agreed (reflected in P3a above)

Proposal 4b [discussion]: RAN2 agree that for L2 remote UE which is out-of-coverage, but connected to network via a relay UE and in RRC CONNECTED state, if the network configuration is not available, i.e., SIB or dedicated signalling, remote UE shall rely on pre-configuration to perform discovery.

Discussion:

LG think this would be an exception to the normal RRC\_CONNECTED behaviour. Lenovo have a similar view, considering the relay as a method for the network to extend its coverage. InterDigital also agree and wonder if this will lead to more specification effort since we have to write in an exceptional case. Samsung agree with LG.

OPPO think both options are feasible, and although there are different preferences we need to decide something. Think we should follow the majority view.

* Agreed

Proposal 6 [discussion]: RAN2 agrees dedicated discovery resource pool is supported besides shared resource pool configuration, whether it is configured is based on network implementation. And PHY layer parameters and design shall reuse the Rel-16 legacy resource pool design (including resource allocation design).

Discussion:

Xiaomi support the proposal but think we have to include that it reuses the Rel-16 resource allocation design.

Intel can agree to the proposal but think we are taking a PHY decision in RAN2, and maybe we should flag it to RAN1. vivo agree. OPPO understand that it was intentional in the WID not to include RAN1, because we expect no RAN1 impact, and they see that the intention of the proposal wording is to clarify no RAN1 impact.

Qualcomm agree with OPPO and think it is not necessary to send an LS to RAN1. If companies really want to notify RAN1 of our agreements we could do that, but not ask questions. Ericsson agree with OPPO and Qualcomm.

Apple and Huawei also think there is no need for an LS to RAN1. Apple also wonder if it is common understanding that the dedicated pool is only supported as a broadcast configuration. OPPO think this was not touched on in the email discussion, but their view is that we should handle discovery without distinguishing cast types, similar to communication.

* No LS to RAN1 on this point
* P6 is agreed

Proposal 7 [discussion]: RAN2 agrees that only the dedicated discovery resource pool can be used if configured by the network, or, if dedicated discovery resource pool is not configured, then the shared resource pool should be used.

Discussion:

ZTE have some concern in case the UE is configured with both dedicated and shared pools; for mode 1 resource allocation in this case, which pool is used should be up to the gNB’s scheduling decision. If the gNB sends a grant for the shared pool, the UE should be able to use it. They think we can postpone the discussion.

Huawei think this is a bit of a detailed discussion, and suggest that we can agree P7 as a principle with the understanding that details can be revisited if an issue is found.

Qualcomm think we could take P7 as a WA.

Nokia share the concern from ZTE, and wonder if this reverts the WA that the shared resource pool is the baseline. They understand that “baseline” means “always supported”. Chair understands that P7 does not say the shared pool is sometimes not supported. Xiaomi understood that the baseline referred to a baseline for future decisions, and the discussion on this proposal was clear.

ZTE, Ericsson, Nokia, LG object to the proposal.

InterDigital think this is a stage 3 issue.

OPPO think the companies with a concern are the same ones who preferred to have only shared pool, and if we have P6 without P7, it creates a problem for how to operate when both pools are configured. They think we should avoid further discussion.

Ericsson would be OK to discuss this as a stage 3 issue. ZTE also

* RAN2 agree that the UE selection between dedicated and shared pool can be discussed as a stage 3 issue after RAN#92-e.

Proposal 8 [discussion]: RAN2 agrees to fix the priority value as 1 of sidelink discovery message in the specification.

* Agreed

Agreements:

Proposal 1 [easy]: RAN2 agrees that for relay/remote UE in RRC IDLE/INACTIVE state, and in-coverage on the serving frequency, if there is discovery related SIB broadcasted on the serving frequency, and if the configuration of concerned SL frequency is included within the SIB of the serving frequency but the Tx resource pool configuration is absent, UE shall enter RRC CONNECTED state to acquire dedicated configuration on Tx resource pool.

Proposal 2 [easy]: RAN2 agree that RRC\_CONNECTED relay/remote UE which are in-coverage on the serving frequency, if there is discovery related SIB broadcasted on the serving frequency, and if the configuration of concerned SL frequency is included within the SIB of the serving frequency, it can only use the SL discovery Tx resource configuration provided by dedicated signalling if provided, or not transmit discovery if not provided.

Proposal 3a [easy]: RAN2 agree that RRC\_CONNECTED L3 relay/remote UE or layer 2 remote UE which are in-coverage on the serving frequency, and the serving frequency is not shared with concerned frequency, if the configuration of concerned SL frequency is absent within the SIB of the serving frequency or if there is no discovery related SIB on the serving frequency,

- If there is Uu coverage at the concerned SL frequency, UE shall 1) rely on the discovery related SIB, if any broadcasted in the concerned SL frequency; Or 2) if there is no discovery related SIB on the concerned SL frequency, UE does not perform SL discovery transmission/reception on the concerned frequency.

- If there is no Uu coverage at the concerned frequency, UE shall rely on pre-configuration.

Proposal 4a [easy]: RAN2 agree that for L2 remote UE which is out-of-coverage, but connected to network via a relay UE and in RRC IDLE/INACTIVE state, if the network configuration is not available, i.e., SIB, remote UE shall rely on pre-configuration to perform discovery.

Proposal 5 [easy]: RAN2 agrees to down-prioritize discovery specific resource allocation optimization in this release.

Proposal 9 [easy]: RAN2 agrees to down-prioritize the support of discovery gaps in this release.

Proposal 4b [discussion]: RAN2 agree that for L2 remote UE which is out-of-coverage, but connected to network via a relay UE and in RRC CONNECTED state, if the network configuration is not available, i.e., SIB or dedicated signalling, remote UE shall rely on pre-configuration to perform discovery.

Proposal 6 [discussion]: RAN2 agrees dedicated discovery resource pool is supported besides shared resource pool configuration, whether it is configured is based on network implementation. And PHY layer parameters and design shall reuse the Rel-16 legacy resource pool design (including resource allocation design).

RAN2 agree that the UE selection between dedicated and shared pool can be discussed as a stage 3 issue after RAN#92-e.

Proposal 8 [discussion]: RAN2 agrees to fix the priority value as 1 of sidelink discovery message in the specification.

The following documents will not be individually treated

[R2-2104736](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2104736%20-%20Remaining%20issues%20on%20relay%20discovery.doc) Remaining issues on relay discovery Qualcomm Incorporated discussion Rel-17 NR\_SL\_relay-Core

[R2-2104746](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2104746_Leftover%20issue%20on%20sidelink%20discovery.docx) Leftover Issues on Sidelink Discovery CATT discussion Rel-17 NR\_SL\_relay-Core

[R2-2104869](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2104869%20(R17%20SL%20Relay%20SI%20AI872%20Discovery).doc) Discovery Procedure for sidelink relay InterDigital discussion Rel-17 FS\_NR\_SL\_relay

[R2-2104892](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2104892%20Discussion%20on%20remaining%20issues%20of%20NR%20sidelink%20relay%20discovery.docx) Discussion on remaining issues of NR sidelink relay discovery OPPO discussion Rel-17 NR\_SL\_relay-Core

[R2-2104958](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2104958_Remaining%20issues%20on%20Relay%20Discovery%20Procedure.docx) Remaining issues on Relay discovery procedure vivo discussion Rel-17

[R2-2104976](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2104976%20Discussion%20on%20Relay%20discovery%20in%20Sidelink%20Relay-final.doc) Discussion on Relay discovery in Sidelink Relay ZTE, Sanechips discussion Rel-17

[R2-2105022](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2105022.docx) Open aspects on relay discovery Intel Corporation discussion Rel-17 NR\_SL\_relay

[R2-2105342](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2105342%20Remaining%20issues%20for%20SL%20relay%20discovery.doc) Remaining issues for SL relay discovery Samsung discussion Rel-17 NR\_SL\_relay-Core

[R2-2105390](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2105390_disc_pool.doc) Discovery resources for sidelink relaying Kyocera discussion

[R2-2105491](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2105491%20-%20Left%20issues%20for%20SL%20discovery.docx) Left issues for SL discovery Ericsson discussion Rel-17 NR\_SL\_relay-Core

[R2-2105535](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2105535%20Discussion%20on%20relay%20discovery.doc) Discussion on Ralay discovery Spreadtrum Communications discussion Rel-17 NR\_SL\_relay-Core

[R2-2105740](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2105740%20Remaining%20issues%20on%20discovery%20for%20sidelink%20relay%20v2.docx) Remaining issues on discovery for sidelink relay Huawei, HiSilicon discussion Rel-17 NR\_SL\_relay-Core

[R2-2105742](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2105742.docx) Use of Pre-configuration and collocated neighbour cell carrier Beijing Xiaomi Mobile Software discussion

[R2-2105807](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2105807%20Relay%20Discovery%20for%20L2%20and%20L3%20relay%20v1.0.doc) Relay Discovery for L2 and L3 relay Lenovo, Motorola Mobility discussion Rel-17

[R2-2106266](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Docs\R2-2106266.zip) Left issues for relay discovery message transmission LG Electronics Inc. discussion Rel-17

[R2-2106435](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2106435%20Consideration%20on%20remaining%20issues%20of%20NR%20sidelink%20relay%20discovery.docx) Consideration on remaining issues of NR sidelink relay discovery China Telecommunications discussion

[R2-2106437](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2106437%20Remaining%20issues%20on%20Relay%20Discovery.docx) Remaining issues on Relay Discovery MediaTek Inc. discussion Rel-17 NR\_SL\_relay-Core

### 8.7.3 Relay re selection

Re-using LTE re/selection as baseline. Including outcome of [Post113bis-e][602][Relay] Definition of relay load criterion (Ericsson).

Email discussion summary

[R2-2105496](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2105496%20-%20%5bPost113bis-e%5d%5b602%5d%5bRelay%5d%20Definition%20of%20relay%20load%20criterion%20(Ericsson).docx) [Post113bis-e][602][Relay] Definition of relay load criterion (Ericsson] Ericsson report Rel-17 NR\_SL\_relay-Core

Proposal 1 [Easy] If relay load criterion is pursued, the definition of relay load criterion shall fulfil the following requirements

a. Simple and easy to compute

b. Reflecting performance that a remote UE could achieve if served by the relay UE candidate

c. Small spec change

d. Low signalling overhead.

Proposal 2 [For discussion][9/20] If relay load criterion is pursued, RAN2 to discuss if relay load criterion shall also fulfil the following requirement, i.e., consistent interpretation of relay load with different capability of the Relay UE taken into account.

Proposal 3 [For discussion] If relay load criterion is pursued, RAN2 to down-select among the following options for relay load criterion

a. (4/20) Option 1: Number of PC5 connections to Remote UEs currently being actively used for relaying

b. (3/20) Option 2: Resource pool usage or capacity

c. (4/20) Option 3: Number of remote UEs being served by the relay UE

d. (4/20) Option 4: free bandwidth (or achievable bit rate) that relay UE can provide for relay traffic

e. (1/20) option 5: Leave to UE implementation

f. (1/20) Option 6: network indication, gNB provides the load indication, e.g. high or low. Relay UE follows gNB’s indication.

Discussion:

P3:

Ericsson think there is a majority to consider relay load, even though not for a specific option.

vivo think options 5 and 6 are under-represented because they were not originally provided by the rapporteur, and they think many companies would be willing to leave this to implementation (option 5).

MediaTek agree with Ericsson and vivo’s suggestion. They think we can include the information and allow the UE to handle it by implementation.

Lenovo and OPPO feel this is an optimisation.

Agreements:

Relay load is not considered as a (re)selection criterion in Rel-17.

Summary document

[R2-2106470](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2106470%20Summary%20-%20AI%208.7.3.docx) [Pre114-e][603][Relay] Summary on agenda item 8.7.3 on relay (re)selection (CATT) CATT discussion Rel-17 NR\_SL\_relay-Core

[Proposals which may be agreed without online discussion:]

Proposal 1: When a Remote UE is connected with a Relay UE and when there is data transmission, the Remote UE shall use SL-RSRP to evaluate whether the PC5 link quality satisfies relay reselection trigger criterion. It is left to UE implementation to handle the case of no data transmission.

Proposal 3: For L2 U2N relay, RRC\_IDLE/RRC\_INACTIVE remote UE triggers relay selection when direct Uu link quality is below a configured threshold, and relay selection for RRC\_CONNECTED remote UE by gNB is handled in CP procedure and service continuity topic for L2 relay.

Proposal 4: For L2 U2N relay, cell ID can be used as additional AS criteria for relay (re)selection. RRC states under which the cell ID may be applied by L2 remote UE and how to use it by L2 remote UE are left to be addressed for L2 specific discussions. And the usage of cell ID by gNB for RRC CONNECTED L2 remote UE is handled by CP procedure and service continuity topic for L2 relay.

Proposal 6: It is up to SA2 to decide how to include L2/L3 relay support in discovery message.

Proposal 7: For RRC\_IDLE/INACTIVE L2 remote UE, the legacy cell (re)selection procedure and relay (re)selection procedure could go independently and up to UE implementation to select either cell or relay. For RRC\_CONNECTED L2 remote UE, it is handled by CP procedure and service continuity topic for L2 relay.

[Proposals need online discussion :]

Proposal 2: RAN2 does not pursue further optimization on the transmit power imbalance issue of PC5 measurement for relay (re)selection.

Proposal 5: RAN2 further discusses that whether L2/L3 relay support is used as additional AS criteria for relay (re-)selection.

Discussion:

P1:

Huawei would like to clarify the last sentence: does it mean nothing in the specification? If so, we should remove the condition “when there is data transmission”.

LG wonder if this proposal excludes SD-RSRP. They think SD-RSRP should be considered firstly, and SL-RSRP only if SD-RSRP is not available.

vivo think we should be explicit if it excludes SD-RSRP. They think it would be left open for the UE implementation to use SD-RSRP when there is no data transmission.

ZTE think we could remove the second sentence and use SL-RSRP even if no data transmission. The remote UE can trigger keep-alive. Qualcomm agree.

1. Use SL-RSRP only when there is data transmission, otherwise leave to UE implementation
2. Use SL-RSRP in all cases and specify how the UE handles no data transmission
3. Use SL-RSRP in all cases, but leave to UE implementation how to obtain it with no data transmission
4. Use SD-RSRP if available, otherwise SL-RSRP
5. Use SL-RSRP if available, otherwise SD-RSRP

CATT understand that all companies agreed SL-RSRP is technically feasible.

InterDigital agree that SL-RSRP can be used when there is data transmission, but think in LTE we had two related discussions: one on RLM/RLF which determined keep-alive was not feasible, and one on CSI triggering which was left to UE implementation. They are not sure the same arguments apply here. They think there is an additional option to use SL-RSRP when available, otherwise SD-RSRP.

Apple have a concern with using both SL-RSRP and SD-RSRP, because the measurements cannot be directly compared with each other. Ericsson think this is related to evaluation of the measurements, which we have not discussed. Apple think this is specific to the relay reselection case, where the reselection threshold may be different for SL-RSRP and SD-RSRP. So they see that options 4 and 5 would be problematic.

Agreements:

Use only SL-RSRP if available; discuss the no data case by email.

Proposal 3: For L2 U2N relay, RRC\_IDLE/RRC\_INACTIVE remote UE triggers relay selection when direct Uu link quality is below a configured threshold, and relay selection for RRC\_CONNECTED remote UE by gNB is handled in CP procedure and service continuity topic for L2 relay.

Proposal 4: For L2 U2N relay, cell ID can be used as additional AS criteria for relay (re)selection. RRC states under which the cell ID may be applied by L2 remote UE and how to use it by L2 remote UE are left to be addressed for L2 specific discussions. And the usage of cell ID by gNB for RRC CONNECTED L2 remote UE is handled by CP procedure and service continuity topic for L2 relay.

Proposal 6: It is up to SA2 to decide how to include L2/L3 relay support in discovery message.

Proposal 7: For RRC\_IDLE/INACTIVE L2 remote UE, the legacy cell (re)selection procedure and relay (re)selection procedure could go independently and up to UE implementation to select either cell or relay. For RRC\_CONNECTED L2 remote UE, it is handled by CP procedure and service continuity topic for L2 relay.

Proposal 1 (modified): When a Remote UE is connected with a Relay UE and when there is data transmission, the Remote UE shall use only SL-RSRP to evaluate whether the PC5 link quality satisfies relay reselection trigger criterion. It is left to UE implementation to handle the case of no data transmission.

* Email for P1, to discuss the no data case: whether to specify the UE behaviour, and if so what the specified behaviour is.
* Email for P2/P5
* [AT114-e][618][Relay] Remaining issues on (re)selection (CATT)

Scope: Resolve remaining open issues on relay (re)selection:

* Discuss the case of no data for evaluating the relay (re)selection trigger criterion, and determine whether a specified UE behaviour is needed, and if so what to specify
* Discuss P2 and P5 of R2-2106470

Intended outcome: Report to CB session, in R2-2106587

Deadline: Tuesday 2021-05-25 1000 UTC (can extend if needed)

[R2-2106587](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2106587%20%5bAT114-e%5d%5b618%5d%5bRelay%5d%20Remaining%20issues%20on%20(re)selection(CATT).docx) [AT114-e][618][Relay] Remaining issues on (re)selection CATT discussion Rel-16 NR\_SL\_relay-Core

Proposal 1[13/22][Discussion]: When a Remote UE is connected with a Relay UE and when there is no data transmission from relay to remote, SL-RSRP should be used for relay reselection trigger evaluation.

Proposal 2[20/21][Easy]: When a Remote UE is connected with a Relay UE and only SL-RSRP is used for relay reselection trigger evaluation, it is left to UE implementation(e.g., based on keep-alive message or CSI reporting) to determine the SL-RSRP in case of there is no sidelink data transmission from relay to remote.

Discussion:

LG think the direction of the “no data transmission” needs to be clear: does it refer to relay=>remote? Chair understands that it is relay=>remote. Intel and OPPO have the same understanding as the chair.

Intel think P1 and P2 are coupled and we need to understand what the UE behaviour should be if there is no data transmission.

vivo find it weird that we would limit the UE implementation to use only SL-RSRP. Suggest we leave SD-RSRP open as a UE implementation option.

Intel think the key question is whether SD-RSRP is supported for the no data case, and they share vivo’s view that leaving it to UE implementation whether to use SD-RSRP might be a compromise. For the power control issue with SD-RSRP, they think we already have this issue in initial selection where SD-RSRP has to be used.

Apple have a similar view to vivo and Intel and think the only consequence of supporting both is that we have to configure two thresholds.

Futurewei wonder if relying on UE implementation would force us to define the condition for “no data transmission”. E.g. how long does the UE need to wait? CATT think this was not discussed in the email discussion and could be left as part of the UE implementation. Xiaomi agree with CATT.

* Leave to UE implementation whether to use SL-RSRP or SD-RSRP for relay reselection trigger evaluation in case of no data transmission from relay to remote.

Proposal 3[16/21][Easy]: The power imbalance issue can be left to [network?] implementation in this release. I.e. RAN2 do not specify a solution to this issue in this release.

Proposal 4[18/22][Easy]: Whether L2/L3 relay support can be used as additional criteria for relay (re-)selection can be left to SA2.

Discussion:

Nokia have some concern with the wording of P4, because SA2 will not decide what we do in AS; they will specify higher layer criteria.

LG think P3 is agreeable with reference to SD-RSRP, but not for SL-RSRP or between SD-RSRP, which would raise new issues.

Apple think the power imbalance issue is not easy to reach agreement on for a new solution. They are not sure how this can be addressed by UE implementation because the UE only sees the RSRP measurements and compares them to the threshold. They think it could be left to network implementation.

MediaTek share the concern from LG and Apple, because the relay UE may have a different Tx power level that affects the measurements. They would be OK with the network implementation solution.

Qualcomm think the point is that we do not specify a solution to the power imbalance issue, and we could agree in those terms. Intel agree.

Ericsson think leaving it as “left to implementation” in P3 is better, because it is open to UE or network implementation solutions. They are OK with this proposal in the original form and can also accept the suggestion from Qualcomm.

OPPO generally agree with Qualcomm. They think we do not exclude the possibility that an implementation does something to address the issue. CATT also agree.

* P4 is agreed
* RAN2 do not specify a solution to the power imbalance issue for relay (re)selection in Rel-17.
* RAN2 understand that the L2/L3 common parts of the relay discovery and (re)selection objectives are complete at stage 2 level from RAN2 perspective.

Agreements:

Leave to UE implementation whether to use SL-RSRP or SD-RSRP for relay reselection trigger evaluation in case of no data transmission from relay to remote.

Proposal 4[18/22][Easy]: Whether L2/L3 relay support can be used as additional criteria for relay (re-)selection can be left to SA2.

RAN2 do not specify a solution to the power imbalance issue for relay (re)selection in Rel-17.

RAN2 understand that the L2/L3 common parts of the relay discovery and (re)selection objectives are complete at stage 2 level from RAN2 perspective.

The following documents will not be individually treated

[R2-2104737](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2104737%20-%20Remaining%20issues%20on%20relay%20(re)selection.doc) Remaining issues on relay (re)selection Qualcomm Incorporated discussion Rel-17 NR\_SL\_relay-Core

* Revised in R2-2104745

[R2-2104745](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2104745%20-%20Remaining%20issues%20on%20relay%20(re)selection.doc) Remaining issues on relay (re)selection Qualcomm Incorporated discussion Rel-17 NR\_SL\_relay-Core Late

[R2-2104747](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2104747_Remain%20Issues%20on%20Relay%20(Re)selection.docx) Remain Issues on Relay (Re)selection CATT discussion Rel-17 NR\_SL\_relay-Core

[R2-2104870](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2104870%20(R17%20SL%20Relay%20SI%20AI873%20Relay%20selection).doc) Relay selection and reselection InterDigital discussion Rel-17 FS\_NR\_SL\_relay

[R2-2104889](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2104889_SL%20Relay%20Reselection_Intel.docx) Open aspects of Relay (re)selection Intel Corporation discussion Rel-17 NR\_SL\_relay-Core

[R2-2104893](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2104893%20Discussion%20on%20remaining%20issues%20of%20relay%20(re)selection.docx) Discussion on remaining issues of NR sidelink relay (re)selection OPPO discussion Rel-17 NR\_SL\_relay-Core

[R2-2104959](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2104959_Remaining%20issues%20on%20Relay%20(re)selection.docx) Remaining issues on Relay (re)selection vivo discussion Rel-17

[R2-2104971](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2104971_Remaining_Open_Issues_Relay_Reselection.docx) Remaining Open Issues on Relay (re-)selection Fraunhofer HHI, Fraunhofer IIS discussion Rel-17

[R2-2104977](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2104977%20Discussion%20on%20Relay%20selection%20in%20Sidelink%20Relay-final.doc) Discussion on Relay selection in Sidelink Relay ZTE, Sanechips discussion Rel-17

[R2-2105127](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2105127%20Remaing%20issue%20on%20relay%20reselection.doc) Discussion on remaining issues of relay (re)selection and discovery Apple discussion Rel-17 NR\_SL\_relay-Core

[R2-2105238](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2105238%20RelaySelectionIssues.docx) Discussion on some relay (re)selection issues Nokia, Nokia Shanghai Bell discussion Rel-17 NR\_SL\_relay-Core

[R2-2105492](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2105492%20-%20Aspects%20for%20SL%20relay%20selection%20and%20reselection.docx) Aspects for SL relay selection and reselection Ericsson discussion Rel-17 NR\_SL\_relay-Core

[R2-2105515](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2105515%20Discussion%20on%20sidelink%20relay%20reselection.doc) Discussion on sidelink relay reselection SHARP Corporation discussion

[R2-2105536](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2105536%20Discussion%20on%20relay%20selection%20and%20reselection.doc) Discussion on Ralay selection and reselection Spreadtrum Communications discussion Rel-17 NR\_SL\_relay-Core

[R2-2105695](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2105695.doc) Relay (re)selection Sony discussion Rel-17 NR\_SL\_relay-Core

[R2-2105750](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2105750.docx) Remote UE use of Relay UE Load Indication Beijing Xiaomi Mobile Software discussion

[R2-2105790](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2105790%20Remaining%20PDB%20for%20SL%20relay.docx) Remaining PDB in UE-to-NW and UE-to-UE Relay Nokia, Nokia Shanghai Bell discussion Rel-17 NR\_SL\_relay-Core

[R2-2105808](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2105808%20Relay%20(re)selection%20for%20L2%20and%20L3%20relay_v1.0.doc) Relay (re)selection for L2 and L3 relay Lenovo, Motorola Mobility discussion Rel-17

[R2-2106011](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2106011.doc) View on definition of relay load criterion Continental Automotive GmbH discussion

[R2-2106160](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2106160%20Remaining%20issues%20on%20relay%20selection%20and%20reselection.docx) Remaining issues on relay selection and reselection Huawei, HiSilicon discussion Rel-17 NR\_SL\_relay-Core

[R2-2106203](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2106203%20Use%20of%20relay%20load%20as%20a%20Relay%20(re)selection%20criterion.docx) Use of relay load as a Relay (re)selection criterion MediaTek Inc. discussion Rel-17

[R2-2106251](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2106251%20Remaining%20issues%20on%20AS%20criteria%20for%20relay%20selection.docx) Remaining issues on AS criteria for relay selection CMCC discussion Rel-17 NR\_SL\_relay-Core

[R2-2106268](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Docs\R2-2106268.zip) AS layer criteria for relay selection and reselection LG Electronics Inc. discussion Rel-17

[R2-2106271](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Docs\R2-2106271.zip) left L2/L3 common issues for relay selection and reselection LG Electronics Inc. discussion Rel-17

[R2-2106344](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2106344%20Other%20remaining%20issues%20on%20(re)selection.docx) Other remaining issues on (re)selection MediaTek Inc. discussion Rel-17

### 8.7.4 L2 relay specific topics

No documents should be submitted to 8.7.4. Please submit to 8.7.4.x.

No suitable agenda item (topic will not be treated this meeting)

[R2-2104742](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2104742%20-%20Further%20discussion%20adaptation%20layer%20of%20L2%20U2N%20relay.doc) Further discussion adaptation layer of L2 U2N relay Qualcomm Incorporated discussion Rel-17 NR\_SL\_relay-Core

#### 8.7.4.1 Control plane procedures

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

Summary document

[R2-2106463](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2106463_%20Summary%20on%20agenda%20item%208.7.4.1%20on%20L2%20relay%20control%20plane%20(vivo).docx) Summary on agenda item 8.7.4.1 on L2 relay control plane vivo discussion Rel-17

* [AT114-e][604][Relay] Summary on agenda item 8.7.4.1 on L2 relay control plane (vivo)

Scope: Discuss the proposals in R2-2106463 and progress toward consensus where possible.

Intended outcome: Report to comeback session, in R2-2106577

Deadline: 2021-05-25 1000 UTC

[R2-2106577](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2106577_%20Summary%20on%20AI%208.7.4.1%20on%20L2%20relay%20control%20plane%20(vivo).docx) Summary on agenda item 8.7.4.1 on L2 relay control plane vivo discussion Rel-17

[Easy]

Proposal 1： [14/18[Easy] RRC state combination of Relay UE in RRC\_IDLE and Remote UE in RRC\_INACTIVE is supported.

Proposal 5： [18/18][Easy]The Uu RLF indication from Relay UE may trigger the Remote UE connection re-establishment

Proposal 6： [18/18][Easy] The Remote UE may trigger the Remote UE connection re-establishment upon detecting PC5 RLF.

Proposal 7： [16/17][Easy] The Remote UE may perform RRC re-establishment procedure as follows:

‒ If a suitable cell is available, the Remote UE initiates RRC re-establishment procedure towards the suitable cell;

‒ If a suitable relay is available, the Remote UE initiates RRC re-establishment procedure towards the suitable relay UE’s serving cell;

‒ If both a suitable cell and a suitable relay are available, the remote UE can select either one to initiate RRC re-establishment procedure based on implementation.

Proposal 8： [18/18][Easy]Confirm that for the OOC case, Remote UE with the RRC state of IDLE or INACTIVE should perform TAU/RNAU procedure

Proposal 9： [18/18][Easy]For IC Remote UE case, Remote UE performs TAU/RNAU based on its own serving cell information (i.e., as legacy) if it is NOT PC5-connected with Relay UE.

Proposal 11： [15/18][Easy]In case of Remote UE RRC resume to a new gNB, legacy Retrieve UE Context procedure is performed, i.e., the new gNB retrieves the Remote UE context for Remote UE.

Proposal 13： [18/18][Easy] the Remote UE can receive the system information via PC5 after PC5 connection establishment with Relay UE.

Proposal 17： [17/18][Easy]When Relay UE in RRC IDLE/RRC INACTVE and Remote UE in RRC IDLE/RRC INACTIVE, the Relay UE monitors paging occasions of its PC5-RRC connected Remote UE(s)

Proposal 19： [17/18][Easy]When Relay UE in RRC CONNECTED and Remote UE in RRC CONNECTED, the Relay UE may monitor for SI change indication and/or PWS notifications in any PO as legacy.

Proposal 21： [15/18][Easy] Deprioritize the discussion on potential issue and solution needed on Remote UE and Relay UE PO overlapping case.

Proposal 22： [15/18][Easy] A new PC5-RRC message is needed to relay the paging information from Relay UE to Remote UE for unicast.

[Cross WG]

Proposal 2： [16/18[Cross WG] RAN2 to send a LS to SA2/CT1 to ask their view on whether a new or existing establishment/resume cause value is used for Relay UE when Relay UE enters RRC\_CONNECTED only for relaying purpose.

Proposal 23： [17/18][Cross WG] Confirm the WA that Remote UE performs UAC based on legacy procedure and send a LS to SA2/CT1 to inform about RAN2 decision.

Proposal 24： [12/18][Cross WG] when IDLE/INACTIVE Relay UE intends to access network only for the purpose of relaying but not for its own service, 12 companies prefer that the Relay UE can skip UAC, while 6 companies have different view.

Proposal 25： [18/18][Cross WG] send a LS to SA2/CT1 to inform about RAN2 conclusion in Proposal 24 and ask them to make final decision.

The following documents will not be individually treated

[R2-2104738](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2104738%20-%20Further%20discussion%20on%20control%20plane%20procedures%20of%20L2%20U2N%20relay.doc) Further discussion on control plane procedures of L2 U2N relay Qualcomm Incorporated discussion Rel-17 NR\_SL\_relay-Core

[R2-2104748](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2104748_Control%20Plane%20Procedures%20of%20L2%20Relay.docx) Control Plane Procedures of L2 Relay CATT discussion Rel-17 NR\_SL\_relay-Core

[R2-2104838](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2104838%20-%20Left%20issues%20on%20RRC%20procedure%20for%20L2%20U2N%20Relay_v2.docx) Left issues on RRC procedure for L2 U2N Relay OPPO discussion Rel-17 NR\_SL\_relay-Core

[R2-2104871](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2104871%20(R17%20SL%20Relay%20SI_AI8741%20CP%20Procedures).doc) Control Plane Procedures for L2 UE to NW Relays InterDigital discussion Rel-17 FS\_NR\_SL\_relay

[R2-2104888](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2104888_SLRelay_ControlPlane_Intel.docx) Control plane procedures for L2N relaying Intel Corporation discussion Rel-17 NR\_SL\_relay-Core

[R2-2104946](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2104946%20Stage%202%20level%20procedure%20for%20Connection%20Establishment%20v1.docx) Stage 2 level procedure for Connection Establishment MediaTek Inc. discussion Rel-17

[R2-2104960](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2104960_Further%20Discussion%20on%20L2%20Control%20Plane%20Procedures.docx) Further Discussion on L2 Control Plane Procedures vivo discussion Rel-17

[R2-2104978](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2104978%20Consideration%20on%20the%20control%20plane%20procedure%20of%20SL%20relay-final.doc) Consideration on the control plane procedure of SL relay ZTE, Sanechips discussion Rel-17

[R2-2105030](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2105030%20control%20plane%20open%20issues.docx) Open Issues in L2 Relay Control Plane Procedures Futurewei discussion Rel-17 NR\_SL\_relay-Core

[R2-2105074](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2105074%20Monitoring%20Paging%20by%20a%20U2N%20Relay.doc) Monitoring Paging by a U2N Relay Lenovo, Motorola Mobility discussion NR\_SL\_relay-Core

[R2-2105076](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2105076%20SI%20acquisition,%20CN%20Registration%20and%20RNAU.doc) SI acquisition, CN Registration and RNAU Lenovo, Motorola Mobility discussion NR\_SL\_relay-Core

[R2-2105128](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2105128%20Discussion%20on%20Unified%20Access%20Control%20in%20Relay%20UE.doc) Discussion on Unified Access Control in Relay UE Apple discussion Rel-17 NR\_SL\_relay-Core

[R2-2105129](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2105129%20Discussion%20on%20RNA%20Update%20procedures%20in%20L2%20UE-to-NW%20Relay.doc) Discussion on RNA Update procedures in L2 UE-to-NW Relay Apple discussion Rel-17 NR\_SL\_relay-Core

* Revised in R2-2106450

[R2-2106450](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2106450%20Discussion%20on%20RNA%20Update%20procedures%20in%20L2%20UE-to-NW%20Relay_v2.doc) Discussion on RNA Update procedures in L2 UE-to-NW Relay Apple discussion Rel-17 NR\_SL\_relay-Core

[R2-2105130](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2105130%20QOS%20for%20Layer%202%20UE-to-NW%20relay.doc) Discussion on QoS mechanism for Layer 2 UE-to-NW relay Apple discussion Rel-17 NR\_SL\_relay-Core

[R2-2105343](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2105343%20On-demand%20SI%20request%20for%20remote%20UE.doc) On-demand SI request for Remote UE Samsung discussion Rel-17 NR\_SL\_relay-Core

[R2-2105380](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2105380%20Discussion%20on%20on-demand%20SI%20acquisition%20procedure%20for%20U2N%20Relay.docx) Discussion on on-demand SI acquisition procedure for U2N Relay ASUSTeK discussion Rel-17 NR\_SL\_relay-Core

[R2-2105391](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2105391_L2_relaying.doc) RRC state transitions and RLF handling in L2 relaying Kyocera discussion

[R2-2105486](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2105486%20Connection%20control%20on%20L2%20relay.doc) Connection control on L2 relay Xiaomi communications discussion

[R2-2105537](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2105537%20Discussion%20on%20control%20plane%20procedures%20for%20L2%20U2N%20relay.doc) Discussion on control plane procedures for L2 U2N relay Spreadtrum Communications discussion Rel-17 NR\_SL\_relay-Core

[R2-2105678](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2105678%20Various%20configuration%20and%20QoS%20management%20aspects%20of%20L2%20relaying.doc) Various configuration and QoS management aspects of L2 relaying Samsung Electronics GmbH discussion

[R2-2105696](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2105696.doc) L2 relay control plane procedures Sony discussion Rel-17 NR\_SL\_relay-Core

[R2-2105739](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2105739%20SIB%20Handling%20in%20Sidelink%20UE-to-Nwk%20Relay.docx) SIB Handling in Sidelink UE-to-Nwk Relay Nokia, Nokia Shanghai Bell discussion Rel-17 FS\_NR\_SL\_relay R2-2103482

[R2-2105773](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2105773-%20Discussion%20on%20control%20plane%20procedures%20for%20L2%20sidelink%20relay.docx) Discussion on control plane procedures for L2 sidelink relay Ericsson discussion Rel-17 NR\_SL\_relay-Core

[R2-2105960](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2105960-Paging%20and%20SI%20deliveries.doc) Paging and SI deliveries for L2 relay ETRI discussion Rel-17 NR\_SL\_relay-Core

[R2-2106054](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2106054%20SL%20L2%20Relay%20adaptation%20layer.docx) Discussion on Uu adaptation layer in L2 UE-to-NW relay Nokia, Nokia Shanghai Bell discussion NR\_SL\_relay

[R2-2106161](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2106161%20Discussion%20on%20the%20CP%20procedures%20for%20L2%20Relay.docx) Discussion on the CP procedures for L2 Relay Huawei, HiSilicon discussion Rel-17 NR\_SL\_relay-Core

[R2-2106252](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2106252%20Discussion%20on%20control%20plane%20procedure.docx) Discussion on control plane procedure CMCC discussion Rel-17 NR\_SL\_relay-Core

[R2-2106273](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Docs\R2-2106273.zip) L2 relay specific topics related to the control plane procedures LG Electronics Inc. discussion Rel-17

[R2-2106293](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2106293%20Discussion%20on%20establishment%20cause%20of%20relay%20UE.doc) Discussion on establishment cause value of relay UE Xiaomi, Nokia, Nokia Shanghai Bell, Lenovo, Motorola Mobility, Vivo, Apple, ZTE discussion

#### 8.7.4.2 Service continuity

Service continuity between Uu and relay paths, limited to intra-gNB cases. This AI will be treated on a time-available basis

Summary document

[R2-2106481](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2106481%20-%20Summary%20on%208.7.4.2.doc) Summary on AI 8.7.4.2 on L2 relay service continuity Samsung discussion Rel-17 NR\_SL\_relay-Core

* [AT114-e][605][Relay] Summary on AI 8.7.4.2 on L2 relay service continuity (Samsung)

Scope: Discuss the proposals from R2-2106481 and progress toward consensus where possible.

Intended outcome: Report to comeback session, in R2-2106578

Deadline: 2021-05-25 1000 UTC

[R2-2106578](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2106578%20Summary%20on%20AI%208.7.4.2%20service%20continuity.doc) Report of [AT114-e][605][Relay] Summary on AI 8.7.4.2 on L2 relay service continuity Samsung discussion Rel-17 NR\_SL\_relay-Core

Proposal 1 (easy) (19/19): The procedure of Figure 4.5.4.1-1 in TR38.836 and the procedure of Figure 4.5.4.2-1 in TR38.836 are the baseline for Remote UE’s intra gNB mobility in RRC\_CONNECTED.

Proposal 2 (easy) (19/19): INM RRC and/or X2/Xn messages for inter-gNB handover are not used for the path switch procedures in intra gNB case.

Proposal 3 (easy) (19/19): DAPS-like path switch procedure for Remote UE is not considered in this release.

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.

Proposal 6 (easy) (19/19): Legacy RRC Reconfiguration and Measurement Report signalling procedures can be used for path switch procedure with extension to evaluate relay link measurement and Uu link measurement.

Proposal 7 (easy): New measurement events 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.

Proposal 10 (easy) (19/19): In case of path switch from indirect to direct, detailed measurement results from Remote UE are reported when configured reporting criteria is met as legacy measurement report.

Proposal 11 (easy) (19/19): SL relay measurement report can include at least Relay UE ID, serving cell ID, RSRP information.

Proposal 13 (easy) (19/19): Remote UE in RRC\_CONNECTED suspend Uu RLM when Remote UE is connected to gNB via Relay UE.

Proposal 14 (easy) (19/19): For indirect to direct path switch, Remote UE stops UP and CP transmission via relay link after reception of RRC Reconfiguration message from gNB (i.e., step 3).

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 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 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 19 (easy) (16/19): For indirect to direct path switch, explicit PC5 unicast link release procedure as legacy can be executed to release PC5 unicast link after Remote UE and Relay UE receive RRC reconfiguration from gNB.

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

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

Proposal 23 (easy) (19/19): For indirect to direct path switch, the timing of step 8 is independent of step 6 and step 7.

Proposal 24 (easy) (19/19): For indirect to direct path switch, RLC and lower layers behaviours of a Remote UE can be similar with those of legacy UE in intra-gNB handover.

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 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, bearer mapping configuration between PC5 RLC and Uu RLC.

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.

Proposal 29 (easy) (19/19): For direct to indirect path switch, Remote UE stops UP and CP transmission over Uu after reception of RRC Reconfiguration message from gNB (i.e., step 3).

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 31 (easy) (19/19): For direct to indirect path switch, the contents in RRC Reconfiguration message for Remote UE can include at least Relay UE ID, PC5 RLC configuration for relaying and associated E2E RB.

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.

Discussion:

The following documents will not be individually treated

[R2-2104739](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2104739%20-%20Service%20continuity%20of%20L2%20U2N%20relay.doc) Service continuity of L2 U2N relay Qualcomm Incorporated discussion Rel-17 NR\_SL\_relay-Core

[R2-2104749](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2104749_Service%20Continuity%20for%20L2%20U2N%20Relay.docx) Service Continuity for L2 U2N Relay CATT discussion Rel-17 NR\_SL\_relay-Core

[R2-2104872](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2104872%20(R17%20SL%20Relay%20SI_AI8742%20Service_Continuity).doc) Service Continuity for L2 UE to NW Relays InterDigital discussion Rel-17 FS\_NR\_SL\_relay

[R2-2104891](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2104891_Further%20Details%20on%20Service%20Continuity%20for%20L2%20U2N%20Relay.docx) Service Continuity support for L2 U2N Relaying Intel Corporation discussion Rel-17 NR\_SL\_relay-Core

[R2-2104894](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2104894%20Discussion%20on%20service%20continuity%20in%20NR%20sidelink%20relay.docx) Discussion on service continuity in NR sidelink relay OPPO discussion Rel-17 NR\_SL\_relay-Core

[R2-2104961](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2104961_Service%20continuity%20and%20Adaptation.docx) Service continuity and Adaptation Layer for L2 SL Relay vivo discussion Rel-17

[R2-2104979](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2104979%20Discussion%20on%20the%20service%20continuity%20of%20SL%20relay.doc) Discussion on the service continuity of SL relay ZTE, Sanechips discussion Rel-17

[R2-2105029](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2105029%20mobility%20open%20issues.docx) Open Issues in Switches between Direct and Indirect Paths Futurewei discussion Rel-17 NR\_SL\_relay-Core

[R2-2105344](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2105344%20Service%20continuity%20support%20for%20SL%20remote%20UE.doc) Service continuity support for SL remote UE Samsung discussion Rel-17 NR\_SL\_relay-Core

[R2-2105741](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2105741%20Discussion%20on%20service%20continuity%20and%20adaptation%20layer%20for%20L2%20UE%20to%20NW%20Relay.docx) Discussion on service continuity and adaptation layer for L2 UE to NW Relay Huawei, HiSilicon discussion Rel-17 NR\_SL\_relay-Core

[R2-2105774](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2105774-%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

[R2-2106253](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2106253%20Service%20continuity%20for%20L2%20relay.docx) Service continuity for L2 relay CMCC discussion Rel-17 NR\_SL\_relay-Core

## 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.

Work planning

[R2-2104921](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2104921%20Clarification%20on%20work%20scope%20of%20Rel-17%20positioning%20enhancement.docx) Clarification on work scope of Rel-17 positioning enhancement Intel Corporation discussion Rel-17 NR\_pos\_enh

Proposal 1: “Latency reduction related to the reporting of the measurements (CG-based transmission)” has been excluded from WI scope;

Proposal 2: “Storing UE positioning capability” has been excluded from WI scope;

Proposal 3: SDT related issues should be discussed in SDT WI, e.g. how UE transfers UL and receives DL in INACTIVE; Positioning specific SDT change is not expected based on RAN plenary discussion;

Proposal 4: Send LS to RAN1, ask them to evaluate what parameters can be changed for on-demand PRS, e.g

- Beam ON/OFF request

- ON/OFF request for the PRS request

- Configuration index

- Explicit PRS configuration, e.g., periodicity, repetition, bandwidth, etc.

- Low power indication

- Preferred number of gNBs/TRPs

- Preferred starting and validity time

Discussion:

Intel clarify that no formal agreement is expected on the proposals and it is to show a rapporteur view.

Nokia think we should prioritise the work according to this view.

Lenovo observe that RAN1 are also discussing the CG aspect.

CATT wonder if we will discuss P4 here or in the on-demand objective, but think something is needed. Chair understands that we have related proposals under 8.11.4.

Ericsson agree that P1/P2 can be second priority, but think we should not exclude contributions in these directions.

* Noted

Incoming LS

[R2-2104713](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2104713_R1-2104089.docx) LS on DL-AoD angle calculation enhancement (R1-2104089; contact: Ericsson) RAN1 LS in Rel-17 NR\_pos\_enh-Core To:RAN2, RAN3

Ericsson indicate that RAN3 are discussing this and they think RAN2 may not need to respond immediately.

vivo think from RAN2 perspective we can discuss the impact of reporting the angle to the LMF, because it may introduce latency.

Intel tend to agree with Ericsson that the main changes are in NRPPa, and they think latency is not an aspect of this discussion since the DL-AoD enhancements are for accuracy. So they do not see the need to discuss it from RAN2 perspective.

Nokia also think we don’t need to take any immediate action, and it may not be clear exactly what information needs to be transferred.

Huawei also think we do not need to take immediate action, and they understand that RAN3 are discussing a possible reply to RAN1.

CATT also have the same view. For the latency reduction, they think we defined a latency model and need to discuss latency reduction based on that, not including new features in Rel-17.

Lenovo also agree that there is no need to rush this and that it is for accuracy enhancements.

* Noted

Withdrawn/Not available

R2-2106092 Clarification on work scope of Rel-17 positioning enhancement Intel Corporation discussion Rel-17 NR\_pos\_enh Withdrawn

R2-2106096 Support of angle calculation enhancement for DL-AoD Intel Corporation discussion Rel-17 NR\_pos\_enh Withdrawn

### 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.

Summary document

[R2-2106449](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2106449%20summary%20of%20AI%208%2011%202%20latency%20reduction.docx) Summary of AI 8.11.2 Latency enhancements CATT discussion Rel-17 NR\_pos\_enh-Core

Scheduled location time aspect:

Proposal 1: Discuss the understanding on scheduled location time within two types:

 Option A: the timing

- The time when the location estimate is to be valid, corresponding to the location measurement time.

- Or take as the timing of UE received LPP Request Location Information (the start time of physical layer latency)

 Option B: the duration

- Duration between transmitting LCS request message from LCS Client/AF/UE(internal LCS client) to LMF and receipt of LPP RequestLocationInformation message at UE.

Proposal 2: Continue evaluation of the LPP impacts for supporting a scheduled location time including the following options:

 Option A: no LPP Stage3 specification impacts: T should be transparent to UE.

 Option B: the scheduled location time is provided to UE both in UE-Assisted and UE-based mode:

- FFS the values for the scheduled location time T

 Option C: the scheduled location time is provided to UE only in UE-based mode.

Proposal 3: Continue evaluation of the NRPPa impacts for supporting a scheduled location time including the following options:

 Option A: neither the scheduled location nor the scheduled measurement time will be forwarded to gNB in DL+UL positioning methods.

 Option B: the scheduled location time is provided to gNB:

- FFS any additional "QoS information" which may need to be conveyed and LS to RAN3

Discussion:

Nokia would like to wait for the clarification from SA2 before we take decisions on this. Intel have the same view and think the proposals are valuable as an overview but we need to wait for clarification.

ZTE think we can postpone the discussion until the reply from SA2 comes in.

vivo think we could clarify the relationship to the response time.

Qualcomm think the SA2 requirement is clear that we need to report the location at the scheduled location time, and RAN2 need to come up with the implementation. They do not see that this can be done without spec impact or by using only the response time.

* Wait for SA2 on the scheduled location issue

Preconfigured assistance data aspect:

Proposal 4: Continue evaluation of the signalling and procedures to support pre-configuration of assistance data to the UE during the location preparation phase on how to preconfigure assistance information (e.g. PRS configuration):

 Option A: The UE is configured with validity conditions (e.g. time validity, area validity) when supporting preconfigured assistance data containing PRS configurations

 Option B: Support dynamic triggering of a preconfigured PRS at UE by LMF or gNB for making measurements on DL-PRS

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

 Option D: Support dynamic triggering of a preconfigured SRSp at UE by gNB for transmitting SRSp based on measurement report provided by UE

Proposal 5: Continue evaluation of the signalling and procedures to support pre-configuration of assistance data to the UE during the location preparation phase on how to trigger to utilize the retained pre-configured positioning assistance information in UE:

 Option A: The location information request may serve as an indication to the UE to utilize the pre-configured AD when NI-LR/MT-LR and deferred MT-LR, and UE indicates the scheduled location time to core network in order to obtain pre-configured assistance data.

Discussion:

Xiaomi think if the LMF has a scheduled location time, the existing procedures can be used, otherwise the configuration can be provided to the gNB and triggered from there. They understand that the Request Location Information can be used as the trigger.

ZTE slightly prefer to support preconfigured assistance data and wonder if there is some overlap with scheduled location.

Huawei think the current specification already supports preconfigured assistance data in that the need codes for the assistance data are Need M, and what we need to resolve here is to define the priority between PRS configurations and enable a release mechanism for PRS configurations.

Qualcomm think there is normally no release mechanism in LPP, because everything is deleted after the session. On P4, they think the intention here was to list all options from the input contributions. They also think there is some overlap with on-demand PRS when we talk about providing multiple PRS configurations to the UE.

CATT understand that we might be able to agree to support pre-configured AD and discuss P5. They wonder what the meaning of the scheduled location time is here.

Huawei understand that pre-configuration of AD is already supported by the existing spec.

Nokia think that the existing Need M codes are a primitive method of supporting pre-configuration and cannot support multiple configurations. They think pre-configuration should be decoupled from a specific phase of the location procedure at this stage.

Ericsson understand that the deferred MT-LR already provides a kind of pre-configuration and we should not duplicate it.

ZTE think existing Rel-16 methods can indicate to the UE to use the pre-configured AD, e.g. if the pre-configured AD is suited for the current positioning service.

Agreements:

Support pre-configuration of assistance data to the UE at least in an LPP session. Details of how to enable this are FFS (e.g. what additional functionality beyond deferred location procedure might be needed).

The LPP Request Location Information message can serve as an indication to the UE to utilize the pre-configured AD. FFS additional conditions/validity criteria for using the pre-configured AD.

Response time aspect:

Proposal 6: Discuss if the LS to RAN4 to trigger the discussion about whether new granularity of the responseTimeEarlyFix is needed in Rel-17.

Prioritization of measurements/reports aspect:

Proposal 7: For prioritization of measurements/reports, RAN2 to discuss the options of prioritization of measurements/reports for latency reduction as below:

 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 priority rules associated to multiple fixes of measurements and associated reports

Discussion:

Qualcomm think “prioritisation of measurements” is a bit unclear and the contributions are more about prioritising positioning methods.

Intel understand that prioritisation is in RAN1 scope.

Configured UL grant for location reports:

Proposal 8: With regard to configured UL grant for location reports, RAN2 to discuss the two aspects as below:

 CG-based solution related to the gNB in Connected mode

o FFS the CG information:

 e.g. the PRS measurement period and starting position in time of the other TRPs

 Additional finer time granularities need to be introduced for both reportingAmount and reportingInterval IEs within the periodicalReporting configuration in LPP message.

o FFS how to transfer the CG information:

 CG configuration information via LMF

 CG configuration information via UE

 Support of CG-based solution for measurement reporting of in-active UEs

Discussion:

Storing capabilities aspect:

Proposal 9: With regard to storing UE positioning capabilities in an LMF/AMF, RAN2 may await more progress in SA2 for determining any RAN2 impacts.

Discussion:

posSI aspect:

Proposal 10: With regard to posSI enhancement, RAN2 may discuss if the enhancement is required when rach-OccasionsSI dedicated to posSI request is not configured for a UE but rach-OccasionsSI parameters configured for normal SI request.

Discussion:

The following documents will not be individually treated

[R2-2104844](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2104844%20Enhancement%20for%20positioning%20latency.docx) Enhancement for positioning latency vivo discussion NR\_pos\_enh-Core

[R2-2104845](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2104845%20Discuss%20Scheduling%20Location%20in%20Advance%20to%20reduce%20Latency.docx) Discuss Scheduling Location in Advance to reduce Latency vivo discussion NR\_pos\_enh-Core

[R2-2104922](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2104922.docx) Scheduled location time based latency reduction Intel Corporation discussion Rel-17 NR\_pos\_enh R2-2102849

R2-2105037 Discussion on positioning latency Huawei, HiSilicon discussion Rel-17 NR\_pos\_enh-Core Withdrawn

[R2-2105142](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2105142%20Discussion%20on%20scheduled%20location%20time%20for%20latency%20reduction.docx) Discussion on scheduled location time for latency reduction CATT discussion Rel-17 NR\_pos\_enh-Core

[R2-2105219](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2105219%20Discussion%20on%20positioning%20latency.docx) Discussion on positioning latency Huawei, HiSilicon discussion Rel-17 NR\_pos\_enh-Core

[R2-2105302](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2105302%20(R17%20NR%20POS%20WI_AI8112_Latency).doc) Discussion on Enhancements for Latency Reduction InterDigital, Inc. discussion Rel-17 NR\_pos\_enh

[R2-2105523](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2105523%20Further%20consideration%20of%20positioning%20latency%20enhancments.doc) Further consideration of positioning latency enhancments OPPO discussion Rel-17 NR\_pos\_enh-Core

[R2-2105557](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2105557%20Discussion%20on%20UE%20capability%20regarding%20positioning%20latency.docx) Discussion on UE capability regarding positioning latency BEIJING SAMSUNG TELECOM R&D discussion Rel-17

[R2-2105560](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2105560%20Positioning%20enhancements%20on%20latency%20reduction.doc) Positioning enhancements on latency reduction Xiaomi discussion

[R2-2105600](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2105600_PosLatencyReduction_LenMM.docx) Positioning Latency Reduction Enhancements Lenovo, Motorola Mobility discussion Rel-17

[R2-2105968](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2105968%20latency%20.docx) "For latency reduction Need of QoS info in gNB and positioning capability storage" Ericsson discussion Rel-17

[R2-2105973](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2105973%20LS%20.docx) draft LS to different groups Ericsson discussion Rel-17

[R2-2106082](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2106082_(Scheduling%20in%20Advance).docx) Scheduling Location in Advance to Reduce Latency Qualcomm Incorporated discussion

R2-2106093 Scheduled location time based latency reduction Intel Corporation discussion Rel-17 NR\_pos\_enh R2-2102849 Withdrawn

[R2-2106261](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2106261%20Discussion%20on%20latency%20reduction%20for%20positioning.docx) Discussion on latency reduction for positioning CMCC discussion Rel-17 NR\_pos\_enh-Core

[R2-2106367](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2106367%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

[R2-2106368](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2106368%20(8.11.2)%20Discussion%20on%20the%20scheduled%20location%20time.docx) Discussion on the scheduled location time Samsung Electronics discussion NR\_pos\_enh-Core

[R2-2106376](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2106376%20(8.11.2)%20posSI%20request%20enhancement%20for%20latency%20reduction.docx) posSI request enhancement for latency reduction Samsung R&D Institute UK discussion

[R2-2106426](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2106426.docx) Discussion on positioning latency reduction ZTE Corporation, Sanechips discussion Rel-17 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.

Summary document

[R2-2106447](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2106447%20Summary%20of%20AI%208.11.3%20for%20INACTIVE%20POS.docx) Summary of AI 8.11.3 for INACTIVE POS Huawei, HiSilicon discussion Rel-17 NR\_pos\_enh-Core

* Revised in R2-2106576

[R2-2106576](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2106576%20Summary%20of%20AI%208.11.3%20for%20INACTIVE%20POS.docx) Summary of AI 8.11.3 for INACTIVE POS Huawei, HiSilicon discussion Rel-17 NR\_pos\_enh-Core

Downlink Positioning

SummaryProposal1: Any uplink LCS or LPP message can be transported in RRC\_INACTIVE from RAN2 perspective. [6434, INTELetAL]

SummaryProposal2: Selection of SDT vs non-SDT is performed by the lower layer for transport of the positioning message for INACTIVE positioning. [6434, INTELetAL]

SummaryProposal3: Support the following options for the transport of measurement results and/or location estimate for positioning in RRC\_INACTIVE. [6434, INTELetAL]

 Case1: PRS measurement and/or location estimate performed in RRC\_INACTIVE can be sent in RRC\_INACTIVE

 Case2: PRS measurement and/or location estimate perform in RRC\_INACTIVE can be sent in RRC\_CONNECTED

 Case3: PRS measurement and/or location estimate performed in RRC\_CONNECTED can be sent in RRC\_INACTIVE

SummaryProposal4: The mechanism for positioning assistance information delivery.

 Case1: The network broadcasts posSIB with/without SI request

 Case2: Assistance Information delivery during RRC\_CONNECTED

 Case3: Assistance Information delivery during RRC\_INACTIVE using SDT in DL

FFS whether to add additional information to differentiate the Assistance Information used for RRC\_INACTIVE and RRC\_CONNECTED

SummaryProposal5: All RAT-independent positioning methods in RRC\_INACTIVE can be supported from RAN2’s perspective. Send an LS to RAN4 on RAN2’s agreement on the support of RAT-Independent positioning.

SummaryProposal6: Support DL E-CID for RRC\_INACTIVE positioning. FFS support for UL E-CID

SummaryProposal7: Support of SDT for positioning can be discussed in SDT session.

Discussion:

P1:

Huawei think we could agree the proposal but should keep the restriction to uplink.

Ericsson think the downlink could also be included.

Fraunhofer wonder if the downlink message would require a transition to RRC\_CONNECTED. Chair understands that this is related to P9. Huawei understand that this only applies when the UE has already initiated UL SDT. Fraunhofer wonder then if we are trying to reduce the number of state transitions.

ZTE think P9 should also be discussed and we can leave the transport to lower layers. From SDT perspective the system does not care what is in the message.

Intel think P1 and P9 can be discussed separately for DL and UL signalling. They understand if there is no UE-initiated SDT and the network triggers positioning, the LMF is not aware of the UE state and the LMF will send the LPP message to RAN, which will use RAN paging according to existing behaviour. Fraunhofer point out we have not agreed the LMF does not know the state.

Nokia agree with P1/P2/P9, and think we should rely on SDT to determine what works for UL/DL with no restriction for positioning purposes. Ericsson have the same view as Nokia, but think the lower layer should be made aware of the QoS requirement for a particular transmission so that it can use SDT appropriately.

Qualcomm think a good UE implementation would have the positioning layer aware of the transport mechanism and the upper layer might behave differently according to the RRC state. They think it is really UE implementation which layer picks the transport.

Agreements:

Any uplink LCS or LPP message can be transported in RRC\_INACTIVE from RAN2 perspective.

Follow Rel-17 SDT framework for INACTIVE UL and DL positioning:

 If the UE initiated data transmission using UL SDT, the network can send DL LCS, LPP message and RRC message (e.g. to configure SRS (TBD on what message is used), if UL positioning supported) to the UE.

 Otherwise, if UE did not initiate UL SDT, rely on legacy operation, i.e. the network shall transition the UE to RRC\_CONNECTED, e.g. based on RAN paging.

* [AT114-e][620][POS] RRC state exposure for positioning (Huawei)

Scope: Discuss the possible need to specify having RRC state of the UE exposed to LPP layer in the UE and/or LMF.

Intended outcome: Report to CB session, in R2-2106588

Deadline: Thursday 2021-05-27 0000

Common Aspects of Downlink and Uplink Positioning

SummaryProposal8: The agreements for DL are also valid for UL, unless it is either obvious that they are not needed for/related to UL or unless it is explicitly stated so.

Discussion:

Qualcomm want to clarify if the proposal means only UL or also UL+DL. Huawei clarify they understood the proposal was intended as general guidance. Intel intended to include UL+DL.

Ericsson think the only relevant question is what can be transported using SDT. They think we can discuss this in the context of specific proposals.

SummaryProposal9: Follow Rel-17 SDT framework for INACTIVE UL and DL positioning: [6434, INTELetAL]

 If the UE initiated data transmission using UL SDT, the network can send DL LCS, LPP message and RRC message (e.g. to configure SRS (TBD on what message is used), if UL positioning supported) to the UE.

 Otherwise, if UE did not initiate UL SDT, rely on legacy operation, i.e. the network shall transition the UE to RRC\_CONNECTED, e.g. based on RAN paging.

SummaryProposal10: RRC state of the UE is not exposed to the positioning function in UE and LMF for UL and DL INACTIVE Positioning. This can be revisited/enhanced in future if deemed useful. [6434, INTELetAL]

SummaryProposal11: RAN2 to down-select from the following options for the types of supported services for DL and UL INACTIVE positioning:

 Option1: Support only deferred MT-LR

 Option2: Support both deferred MT-LR and MO-LR

 Option3: Ask SA2 to make the decision

Discussion:

Ericsson think we could send an LS to SA2 and let them take our agreements into account.

ZTE think we do not need to discuss which services can be supported.

vivo generally agree that SA2 should be informed.

Intel tend to agree with ZTE and think this is related to whether the RRC state should be exposed to the LMF; if the LMF does not see the state, then all cases can be supported naturally. They think we could come back after we conclude on the state and ask SA2 to confirm.

Uplink Positioning

SummaryProposal12: SRS configuration for UL positioning in RRC\_INACTIVE is carried by RRCRelease message with suspendConfig, similar to CG-SDT.

Discussion:

ZTE think it’s fine to use CG-SDT, but wonder if we need to restrict the use case.

Fraunhofer think we have not discussed this enough yet. Nokia also think it is too early.

Qualcomm support the proposal and think we could also include P13 and P14, perhaps by email.

SummaryProposal12 (modified): Signal configuration for UL positioning in RRC\_INACTIVE can be carried by RRCRelease message with suspendConfig.

SummaryProposal13: TA configuration is included in RRCRelease with suspendConfig for UL positioning in RRC\_INACTIVE, similar to CG-SDT.

SummaryProposal14: RAN2 should send an LS to RAN1 on RAN2’s agreement on UL positioning in RRC\_INACTIVE, and to address the issues on TA, power control, spatial relation, etc.

Discussion:

Huawei think it would be useful to send the LS to trigger discussion and the main UL positioning impact is in RAN1.

Nokia think it would be a bit premature to send an LS now and they would like to progress more specifics first; RAN1 may have enough work already.

Intel think the fundamental issue for UL positioning is whether PRACH or existing SRS should be used, and this is open in RAN1 and important to RAN2 discussion; so at least we should trigger discussion on this aspect.

vivo agree with Intel and also think P12 could be agreed and captured in the LS.

* [AT114-e][621][POS] LS to RAN1 on UL positioning in RRC\_INACTIVE (Intel)

Scope: Confirm the need to send an LS to RAN1 to inform them of RAN2 agreements affecting UL positioning in RRC\_INACTIVE, and trigger the work on related open issues in RAN1.

Intended outcome: Agreeable LS

Deadline: Thursday 2021-05-27 0000 UTC

Stage2 Text Proposal

SummaryProposal15: Develop a baseline Stage 2 description for positioning of UEs in RRC\_INACTIVE state first, including support for DL-, UL-, UL+DL, and RAT-independent methods based on the stage2 text proposal in [6083, QC]

Discussion:

Relationship of INACTIVE POS with Core Network

SummaryProposal16: Send an LS to SA2 for the agreements in RAN2 for INACTIVE positioning and any questions that RAN2 agree to send.

Proposals for future discussion:

SummaryProposal17: RAN2 to discuss in future meetings whether to define UE capability in RRC and LPP for the UE’s support for UL and DL positioning in RRC\_INACTIVE.

SummaryProposal18: RAN2 should further study the following for INACTIVE positioning:

 Low latency change notification of posSIB with paging and SI change notification message

 Applicability of the SRS configuration with mobility and whether to define a validity area for this

 Alignment between DL-PRS reception/measurement and DRX configurations

 Use paging to trigger the PRS measurement of SRS transmission in RRC\_INACTIVE POS

 Optimize the data size of positioning reports for INACTIVE POS

 Modify the SDT data volume threshold considering the data size of positioning reports

 gNB inform LMF for the SDT data volume threshold, the LMF adjust configuration for positioning data report, LMF indicate to the gNB the estimated size of measurement reports

 whether it is necessary to have the assistance information from LMF to NG-RAN

 for the periodicity of the periodic deferred MT-LR for CG-SDT with the LMF knowing the RRC state of the UE,

 for the request of positioning in Inactive from LMF to gNB.

SummaryProposal19: The following can be discussed under a more general discussion not confirm to INACTIVE POS

 Unicast tag in system information for posSIB retrieval

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

Scope: Develop stage 2 level descriptions of the positioning procedures in RRC\_INACTIVE, using the deferred MT-LR procedure as a framework for parts where some LCS procedural context is necessary. (This does not imply that only deferred MT-LR would be supported.) The scope can include the possibility of no stage 2 impact.

Intended outcome: Report to next meeting

Deadline: Long

The following documents will not be individually treated

[R2-2104802](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2104802%20Positioning%20for%20UEs%20in%20RRC_INACTIVE%20state.docx) Positioning for UEs in RRC\_INACTIVE state CATT discussion Rel-17 NR\_pos\_enh-Core

[R2-2104846](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2104846%20Discussion%20on%20open%20issues%20of%20positioning%20support%20in%20%20RRC_INACTIVE%20state.docx) Discussion on open issues of positioning support in RRC\_INACTIVE state vivo discussion NR\_pos\_enh-Core Withdrawn

[R2-2104847](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2104847%20Discussion%20on%20UL%20positioning%20support%20in%20%20RRC_INACTIVE%20state.docx) Discussion on UL positioning support in RRC\_INACTIVE state vivo discussion NR\_pos\_enh-Core Withdrawn

[R2-2104923](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2104923%20Support%20of%20Positioning%20in%20RRC_INACTIVE%20v05.docx) Support of Positioning in RRC\_INACTIVE Intel Corporation, Apple, OPPO, Xiaomi, InterDigital Inc., Spreadtrum, CATT, Huawei, HiSilicon, ZTE, vivo, Convida Wireless, Nokia discussion Rel-17 NR\_pos\_enh Revised

R2-2105034 Discussion on positioning in RRC INACTIVE state Huawei, HiSilicon discussion Rel-17 NR\_pos\_enh-Core Withdrawn

R2-2105041 Draft LS to SA2 on INACTIVE positioning Huawei, HiSilicon discussion Rel-17 NR\_pos\_enh-Core Withdrawn

[R2-2105216](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2105216%20Discussion%20on%20positioning%20in%20RRC%20INACTIVE%20state.docx) Discussion on positioning in RRC INACTIVE state Huawei, HiSilicon discussion Rel-17 NR\_pos\_enh-Core

[R2-2105222](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2105222%20Draft%20LS%20to%20SA2%20on%20INACTIVE%20positioning.docx) Draft LS to SA2 on INACTIVE positioning Huawei, HiSilicon discussion Rel-17 NR\_pos\_enh-Core

[R2-2105303](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2105303%20(R17%20NR%20POS%20WI%20AI8113_INACTIVE_AD).doc) Discussion on Positioning in RRC INACTIVE state InterDigital, Inc. discussion Rel-17 NR\_pos\_enh

[R2-2105304](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2105304%20(R17%20NR%20POS%20WI%20AI8113_INACTIVE_SDT).doc) Discussion on Positioning Information reporting using SDT InterDigital, Inc. discussion Rel-17 NR\_pos\_enh

[R2-2105309](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2105309%20(R17%20NR%20POS%20WI%20AI8117_INACTIVE_Mobility).doc) Discussion on Positioning during Mobility in RRC INACTIVE InterDigital, Inc. discussion Rel-17 NR\_pos\_enh

[R2-2105339](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2105339-%20Supporting%20positioning%20in%20RRC_INACTIVE%20state.docx) Supporting positioning in RRC\_INACTIVE state OPPO discussion Rel-17 FS\_NR\_pos\_enh

[R2-2105340](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2105340%20-%20Discussion%20on%20UL%20Positioning%20methods%20in%20RRC_INACTIVE%20state.docx) Discussion on UL Positioning methods in RRC\_INACTIVE state OPPO discussion Rel-17 FS\_NR\_pos\_enh

[R2-2105546](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2105546-%20Discussion%20on%20positioning%20in%20RRC_INACTIVE%20state%7f.docx) Discussion on positioning in RRC\_INACTIVE state Spreadtrum Communications discussion Rel-17 NR\_pos\_enh-Core

[R2-2105561](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2105561%20Discussion%20on%20positioning%20for%20UEs%20in%20RRC%20Inactive.doc) Discussion on positioning for UEs in RRC Inactive Xiaomi discussion

[R2-2105601](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2105601_Inactive_Positioning_LenMM.docx) On Positioning in RRC\_INACTIVE state Lenovo, Motorola Mobility discussion Rel-17

[R2-2105703](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2105703_Pos_Inactive_Final.docx) Considerations on positioning RRC Inactive Sony discussion Rel-17 NR\_pos\_enh-Core

[R2-2105710](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2105710_RRC_INACTIVE_Fraunhofer.docx) Considerations on Assistance data for positioning in RRC\_INACTIVE mode. Fraunhofer IIS; Fraunhofer HHI discussion

[R2-2105971](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2105971%20SDT.docx) On Maximizing benefits of SDT Ericsson discussion Rel-17

[R2-2106083](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2106083_(positioning%20in%20inactive%20state).docx) Positioning of UEs in RRC Inactive State Qualcomm Incorporated discussion

R2-2106094 Support of Positioning in RRC\_INACTIVE Intel Corporation discussion Rel-17 NR\_pos\_enh Withdrawn

[R2-2106104](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2106104%20Support%20of%20UL%20and%20RAT%20independent%20positioning%20%20in%20RRC_INACTIVE.docx) Support of UL and RAT independent positioning in RRC\_INACTIVE Intel Corporation discussion Rel-17 NR\_pos\_enh

[R2-2106369](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2106369%20(8.11.3)%20Support%20of%20positioning%20result%20reporting%20in%20Inactive%20state.docx) Support of positioning result reporting in Inactive state Samsung Electronics discussion NR\_pos\_enh-Core

[R2-2106408](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2106408%20Discussion%20on%20UL%20positioning%20support%20in%20%20RRC_INACTIVE%20state.docx) Discussion on UL positioning support in RRC\_INACTIVE state vivo discussion NR\_pos\_enh-Core

[R2-2106409](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2106409%20Discussion%20on%20open%20issues%20of%20positioning%20support%20in%20%20RRC_INACTIVE%20state.docx) Discussion on open issues of positioning support in RRC\_INACTIVE state vivo discussion NR\_pos\_enh-Core

[R2-2106429](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2106429.docx) Discussion on DL INACTIVE positioning ZTE Corporation, Sanechips discussion Rel-17 NR\_pos\_enh-Core

[R2-2106430](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2106430.docx) Discussion on MG for INACTIVE positioning ZTE Corporation, Sanechips discussion Rel-17 NR\_pos\_enh-Core

[R2-2106434](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2106434%20Support%20of%20Positioning%20in%20RRC_INACTIVE%20v06.docx) Support of Positioning in RRC\_INACTIVE Intel Corporation, Apple, OPPO, Xiaomi, InterDigital Inc., Spreadtrum, CATT, Huawei, HiSilicon, ZTE, vivo, Convida Wireless, Nokia discussion Rel-17 NR\_pos\_enh R2-2104923 Late

### 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.

Summary document

[R2-2106467](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2106467_(Summary-OnDemandPRS).docx) Summary on agenda item 8.11.4 on on-demand PRS Qualcomm Incorporated discussion

Proposal 1: The on-demand DL-PRS request in an LPP Request Assistance Data message can include:

(a) explicit parameter defining a DL-PRS configuration (e.g., as defined by parameters in LPP IE NR DL-PRS-AssistanceData), or

(b) an identifier pointing to a pre-defined on-demand DL-PRS configuration.

Discussion:

Ericsson think this is mainly for FR2 where a particular direction might be needed, so predefining a configuration could be very difficult. They understand that it relates to the QoS which is LMF implementation dependent; they are OK with the (a) part of the proposal.

CATT think the options are stage 3 and we need to discuss the predefined configuration first. They support the (b) part of the proposal.

Qualcomm disagree that this is just for FR2 and think it is more generally applicable. In the general case, they understand that there might be no PRS transmitted and the UE needs to request to turn it on. They agree with Ericsson that the configurations are up to the network, but think that (b) is easier for both implementation and specification. However, they think option (a) is also needed to allow a more fine-grained request; they think all contributions mentioned both options.

ZTE support both (a) and (b) and think the final decision rests with the LMF. Defining a predefined configuration prevents the UE from having to send the full details every time.

Chair suggests we agree (b) and continue to discuss (a). Ericsson think we should agree both if we want to agree either, and we have not fully analysed what the predefined configuration would look like.

Nokia think preconfiguration is a good solution from a latency pov, and note that it meshes with the agreement from the latency AI to have preconfigured assistance data. They could agree to both options.

Ericsson think preconfiguration would constrain the network implementation. E.g. if one UE asks for short periodicity then the network will always have to use short periodicity.

Intel support both options but think the detailed parameters are stage 3.

Huawei also think we can support both options; they are not sure that the implementation described by Ericsson is a good idea.

Agreements:

The network can signal predefined PRS configurations to the UE and the UE can select one to request. FFS if the UE can request a configuration with different parameters and exactly which parameters are flexible.

Proposal 1a: On demand PRS is subject to the complete NW deployment and not limited to few subsets or pre-configured selection; UE can request new PRS config by sending reasons as why current config is not suitable.

Proposal 2: Define a new LPP assistance data IE which can contain a set of possible on-demand DL-PRS configurations, where each on-demand DL-PRS configuration has an associated identifier.

NOTE: This new IE does not define the currently active DL-PRS configuration.

Proposal 3: The new LPP assistance data IE from Proposal 2 can be included in an LPP Provide Assistance Data message and/or in a new posSIB.

Discussion:

CATT think P3 could be discussed later, especially the posSIB part. They think the request should be under network control and the UE should not start its request from a posSIB.

ZTE are generally OK with P3 and wonder how many preconfigurations are needed.

Qualcomm think including the assistance data in the posSIB is business as usual, and the posSIB is the best way to control the UE request.

Nokia agree with Qualcomm.

Intel understand that the network could indicate the PRS set in posSIB to indicate that it allows the request.

Ericsson note that the number of posSIBs is growing and they are concerned about scheduling.

Agreements:

Proposal 2: Define a new LPP assistance data IE which can contain a set of possible on-demand DL-PRS configurations, where each on-demand DL-PRS configuration has an associated identifier.

Proposal 3 (modified): The new LPP assistance data IE from Proposal 2 can be included in an LPP Provide Assistance Data message and/or a new posSIB.

Proposal 4: The NRPPa procedure(s) for on-demand DL-PRS should support at least the following functionality:

- Providing the requested on-demand DL-PRS configuration information from an LMF to the gNB (e.g., explicit parameter or identifier of a predefined DL-PRS configuration)

- Provision of (possible/allowed) on-demand DL-PRS configurations from a gNB to an LMF

- TRP capability transfer (e.g., whether the RAN node supports the reconfiguration of DL-PRS, etc.)

Discussion:

OPPO wonder if the second bullet implies that the gNB would provide multiple possible configurations, or only the updated configuration based on the LMF request. Qualcomm understood that most contributions proposed the former, but agree that bullet 2 can also be done by OAM.

CATT understand that for bullet 2, this could also be done by OAM. So they do not see the need to include it in NRPPa.

Intel think we just need to inform RAN3 of the high-level functionality and they should discuss between NRPPa and OAM. Ericsson agree.

Agreement:

Proposal 4 (modified): The procedure(s) for on-demand DL-PRS should support at least the following functionality (up to RAN3 what is in NRPPa vs. OAM, etc.):

- Providing the requested on-demand DL-PRS configuration information from an LMF to the gNB (e.g., explicit parameter or identifier of a predefined DL-PRS configuration), and confirmation of the request by the gNB

- Provision of (possible/allowed) on-demand DL-PRS configurations that the gNB can support from a gNB to an LMF

- TRP capability transfer (e.g., whether the RAN node supports the reconfiguration of DL-PRS, etc.)

* [AT114-e][622][POS] LS to RAN3 on agreements for on-demand PRS (Ericsson)

Scope: Indicate to RAN3 our agreements on on-demand PRS and trigger them to take into account.

Intended outcome: Agreeable LS

Deadline: Thursday 2021-05-27 0000 UTC

Proposal 5: The on-demand DL-PRS request can include the following explicit parameter:

- start time and duration for the requested DL-PRS configuration

- request for turning DL-PRS on/off

- requested TRP-IDs/number of TRPs for DL-PRS

- request for turning DL-PRS beams on/off

- requested DL-PRS resource/resource-set, periodicity, repetition, muting, Tx power indication, number of beams

NOTE: Additional parameter may be provided by RAN1 (see Proposal 10)

Discussion:

Ericsson are OK with this list of parameters. Lenovo are generally OK but request clarification on the second and fourth bullets: Is bullet 2 for specific resources while bullet 4 is for all resources in a beam?

CATT wonder if this is for LMF-initiated or UE-initiated. Chair understands we agree to have a common framework.

Ericsson think the number of TRPs should not be indicated.

Qualcomm think Lenovo’s understanding is correct, and the number of TRPs is needed because the UE knows how many measurements it needs.

* [AT114-e][623][POS] LS to RAN1 on parameters for on-demand PRS (Intel)

Scope: Draft an LS to RAN1 indicating the parameters from P5 of R2-2106467 as candidates for the on-demand DL-PRS request, and asking them to take a decision on the needed parameters.

Intended outcome: Agreeable LS

Deadline: Thursday 2021-05-27 0000 UTC

Proposal 6: A UE can provide assistance information/measurements to an LMF to assist an LMF in the determination of appropriate on-demand DL-PRS.

The assistance information/measurements may comprise:

- RRM measurement results

- Position measurement results and associated quality metrics

NOTE: New measurements (if any) would need to be discussed in RAN1.

Proposal 6a: LMF shall provide the UE with information on the on-Demand PRS which associates an on-demand PRS with one or more of DL-PRS. The UE can select to measure on-demand PRSs based on its measurement on the associated DL-PRS.

Proposal 7: For providing the assistance information/measurements to an LMF for the determination of appropriate on-demand DL-PRS configurations, the existing LPP procedures are used (e.g., LPP Request/Provide Location Information, etc.).

Proposal 8: A UE may require criteria or event in order to trigger an on-demand DL-PRS request to the LMF. FFS Details of the on-demand DL-PRS trigger criteria.

Proposal 9: The Stage 2 overall procedure for on-demand DL-PRS should show the following blocks/steps as outlined in the Figure above:

1. Possible on-demand DL-PRS configuration provisioning (posSI)

2. LCS Service Request

3. Nlmf\_Location\_DetermineLocationRequest

4. Possible LPP procedures

5. On-demand DL-PRS reconfiguration procedures

6. LPP procedures and possible NRPPa procedures

7. Nlmf\_Location\_DetermineLocationResponse

8. LCS Service Response

9. Possible On-demand DL-PRS reconfiguration procedures (possible switch-back to original DL-PRS configuration)

NOTE: Individual NRPPa and LPP procedure details (if needed) may be shown in separate sections (as common practice in Stage 2).

Proposal 10: Discuss and decide whether the following LSs should be sent from this RAN2 meeting:

- Inform SA2 on the overall Stage 2 procedure for on-demand DL-PRS

- Request from RAN1 a definition/specification of possible on-demand DL-PRS request parameter(s)

- Request RAN3 to define NRPPa procedures for on-demand DL-PRS (e.g., based on Proposal 4, Proposal 9)

Discussion:

* [Post114-e][603][POS] Procedures and signalling for on-demand PRS (Ericsson)

Scope: Progress the design of on-demand PRS:

* Stage 2 procedure for the on-demand PRS request and configuration (can consider P9 of R2-2106467)
* Triggering conditions (if any are to be specified) for UE-originated and LMF-originated DL-PRS request
* Need for signalling from the UE of explicit parameters defining a requested DL-PRS configuration
  + Does not include definition of the parameters that could be requested

Intended outcome: Report to next meeting

Deadline: Long

The following documents will not be individually treated

[R2-2104803](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2104803%20Further%20discussion%20on%20on-demand%20PRS.docx) Further discussion on on-demand PRS CATT discussion Rel-17 NR\_pos\_enh-Core

[R2-2104848](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2104848%20Discuss%20on%20demand%20PRS.docx) Discuss on-demand PRS vivo discussion NR\_pos\_enh-Core

[R2-2104924](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2104924%20Support%20of%20on%20demand%20PRS.docx) Support of on-demand PRS request Intel Corporation discussion Rel-17 NR\_pos\_enh

R2-2105035 Discussion on on-demand PRS Huawei, HiSilicon discussion Rel-17 NR\_pos\_enh-Core Withdrawn

R2-2105040 Stage-2 TP for on-demand PRS Huawei, HiSilicon discussion Rel-17 NR\_pos\_enh-Core Withdrawn

[R2-2105134](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2105134%20Discussion%20on%20demand%20PRS.doc) Discussion on UE-initiated on-demand PRS Apple discussion Rel-17 NR\_pos\_enh-Core

[R2-2105217](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2105217%20Discussion%20on%20on-demand%20PRS.docx) Discussion on on-demand PRS Huawei, HiSilicon discussion Rel-17 NR\_pos\_enh-Core

[R2-2105221](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2105221%20Stage-2%20TP%20for%20on-demand%20PRS.docx) Stage-2 TP for on-demand PRS Huawei, HiSilicon discussion Rel-17 NR\_pos\_enh-Core

[R2-2105305](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2105305%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

[R2-2105306](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2105306%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

[R2-2105338](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2105338-%20Discussion%20on%20on-demand%20DL-PRS.doc) Discussion on on-demand DL-PRS OPPO discussion Rel-17 FS\_NR\_pos\_enh

[R2-2105547](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2105547-%20Discussion%20on%20on-demand%20PRS.docx) Discussion on on-demand PRS Spreadtrum Communications discussion Rel-17 NR\_pos\_enh-Core

[R2-2105562](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2105562%20Positioning%20enhancement%20to%20on-demand%20DL%20PRS%20.doc) Positioning enhancement to on-demand DL PRS Xiaomi discussion

[R2-2105603](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2105603_On-DemandPRS_LenMM.docx) On-Demand DL-PRS Support Lenovo, Motorola Mobility discussion Rel-17

[R2-2105704](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2105704_Pos_PRS_Ondemand_Final.docx) Considerations on positioning PRS On-demand Sony discussion Rel-17 NR\_pos\_enh-Core

[R2-2105734](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2105734_OnDemandPRS_Fraunhofer.docx) On-demand PRS Fraunhofer IIS, Fraunhofer HHI discussion Rel-17 R2-2103564

[R2-2105969](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2105969%20On%20Demand%20PRS.docx) On demand PRS Ericsson discussion Rel-17

[R2-2106084](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2106084_(On-demand%20PRS).docx) On-Demand DL-PRS Qualcomm Incorporated discussion

R2-2106095 Support of on-demand PRS request Intel Corporation discussion Rel-17 NR\_pos\_enh Withdrawn

[R2-2106354](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2106354%20On-demand%20PRS%20_UE_feedback.docx) UE feedback for on-demand PRS Nokia, Nokia Shanghai Bell discussion Rel-17 NR\_pos\_enh-Core

[R2-2106355](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2106355%20Preconfiguration%20of%20on-demand%20PRS.docx) Pre-configuration and initiation of on-demand PRS associated with QoS/radio conditions Nokia, Nokia Shanghai Bell discussion Rel-17 NR\_pos\_enh-Core

[R2-2106370](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2106370%20(8.11.4)%20Support%20of%20on-demand%20DL%20PRS%20for%20positioning%20efficiency%20.docx) Support of on-demand DL PRS for positioning efficiency Samsung Electronics discussion NR\_pos\_enh-Core

[R2-2106379](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2106379%20on-demand%20PRS.docx) On-demand DL PRS transmission and reception Convida Wireless discussion

[R2-2106424](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2106424.docx) Discussion on restriction of on demand PRS ZTE Corporation, Sanechips discussion Rel-17 NR\_pos\_enh-Core

[R2-2106425](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2106425.docx) Discussion on on demand PRS ZTE Corporation, Sanechips discussion Rel-17 NR\_pos\_enh-Core

### 8.11.5 GNSS positioning integrity

Signalling, and procedures to support GNSS positioning integrity determination.

Summary document

[R2-2106453](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2106453%20Summary%20-%20AI%208.11.5.docx) [Pre114-e][609][POS] Summary on agenda item 8.11.5 on GNSS integrity (Nokia) Nokia discussion Rel-17 NR\_pos\_enh-Core

Proposal 1: RAN2 confirms that LPP messages RequestCapabilities and ProvideCapabilities are used to transfer capability information of positioning integrity support. FFS the contents of capability information for positioning integrity support.

Discussion:

Qualcomm think we should say “GNSS positioning integrity support”. Nokia agree and think this applies to some of the other proposals as well.

Agreement:

Proposal 1 (modified): RAN2 confirms that LPP messages RequestCapabilities and ProvideCapabilities are used to transfer capability information of GNSS positioning integrity support. FFS the contents of capability information for GNSS positioning integrity support.

Proposal 2: RAN2 confirms that liaison with RTCM for GNSS positioning integrity support is beneficial from RAN2’s perspective. FFS the scope of such liaison if RAN2 agrees to liaise with RTCM.

Discussion:

ESA think we should reach out to RTCM in response to the LS they sent to RAN plenary. They think we can reply to the RTCM LS and provide e.g. the list of feared events. They think we need to understand RTCM’s timeline.

Nokia think for an LS with RTCM, we need to look at what kind of assistance information and feared events we can cooperate on. They think some further work in 3GPP to identify this information might be needed, but something can be sent now.

u-blox tend to agree that an LS is useful, and we could direct them to the TR from the SI and ask for comments.

Qualcomm do not think we have an agreement on the list of feared events from the SI phase; it is not captured in the WID or the conclusions. They are concerned about giving a wrong impression by enumerating the feared events.

* [AT114-e][624][POS] LS to RTCM on GNSS integrity (ESA)

Scope: Draft an LS to RTCM informing them of our agreements on GNSS integrity and soliciting their input.

Intended outcome: Agreeable LS

Deadline: Thursday 2021-05-27 0000 UTC

* [Post114-e][601][POS] GNSS integrity assistance information, KPIs, and reporting of integrity results (Swift)

Scope: Discuss the contents of GNSS integrity assistance information, the signalled KPIs, and reporting of the integrity results.

Intended outcome: Report to next meeting

Deadline: Long

Proposal 3: RAN2 confirms that both Network-assisted integrity method (integrity is derived by UE) and UE-assisted integrity method (integrity is derived by LMF) will be specified in Rel-17. LMF may determine the integrity method to be applied. FFS how these methods will be supported in Rel-17.

Proposal 4: In Rel-17, RAN2 only considers UE-based positioning for Network-Assisted Integrity method and UE-assisted positioning for UE-Assisted Integrity method.

Discussion:

Nokia think P3 just confirms the scope.

Huawei think the first sentence of P3 is already in the WID and the rest is agreeable. For P4, they think we need to establish a general understanding first; they think the entity that performs integrity derivation does not necessarily also need to compute the position.

Qualcomm think the term “integrity method” is wrong, and the integrity is computed by the position calculation function. They find the wording unclear, and think it’s correct (but already in the WID) that integrity is supported for both UEB and UEA positioning.

Swift agree with Qualcomm, and are not sure that the LMF will always determine the integrity mode; e.g., in UE-based MO-LR it may be up to the UE.

Intel also agree with Qualcomm. They think we need to control who decides whether we use UE-based or UE-assisted integrity, so we need the second half of P3.

Swift agree that the entity that does the positioning computes the integrity.

Proposal 5: RAN2 confirms positioning integrity requirements are associated to QoS, and send LS to SA1, SA2, CT1, and CT4 for relevant specification work. FFS whether the concept of “integrity level classification” should be supported in Rel-17.

Discussion:

Huawei think we could send an LS to SA1 to capture the use cases, but for SA2 we do not have the overall procedure ready and we can send an LS when we capture the stage 2 aspects.

Intel wonder about the relationship between integrity requirement and QoS; they understand that there is no direct association between them. They are not sure what we would ask SA1 or if we just want them to capture use cases, and they doubt if the latter is needed.

Proposal 6: RAN2 confirms that positioning integrity requirement information (a.k.a. KPIs) including AL, TIR, and TTA can be provided to the integrity computing entity (either UE or LMF) over LPP. FFS the need of TIR set.

Proposal 7: RAN2 confirms that at least integrity result reporting mode 1 (PL reporting) is supported in Rel-17. The messages RequestLocationInformation and ProvideLocationInformation in LPP are used for signalling relating to integrity result reporting. FFS if other types of reporting (including Mode 2) and/or optimization mechanisms are needed.

Proposal 8: RAN2 confirms that assistance information for positioning integrity may include:

- Feared events in the GNSS Assistance Data

- Feared events in transmitting the data to the UE

- GNSS feared events

- UE feared events

RAN2 continues to discuss details about assistance data parameters required for GNSS positioning integrity support. Possible liaison with RTCM may be taken into account.

Discussion:

Qualcomm think P6 uses the ill-defined concept of “integrity computing entity”, which should just be the entity that computes the location. For P7, they think we should have mode 2 and mode 1 can be FFS, because two UEs may provide different implementation-dependent PLs as output and it’s not clear what the LMF should do with that, whereas “safe/unsafe” is clear.

ESA agree with Qualcomm and think the PL will always be available where the position is computed. Qualcomm note that for UE-assisted positioning, the LMF should be able to compare PLs.

Swift are fine with P6 and P7 as they are, and think it is typical that the user (in this case the LCS client) would be provided with the PL. They see mode 1 as more general and are not sure of the need for mode 2.

ZTE are fine with P6, P7, and P8; for P8 they think the feared events should be included in the integrity assistance information, and an LS to RTCM is needed.

The following documents will not be individually treated

[R2-2104843](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2104843%20Discussion%20on%20methodologies%20for%20network-assisted%20and%20UE-assisted%20integrity.docx) Discussion on methodologies for network-assisted and UE-assisted integrity vivo discussion NR\_pos\_enh-Core

R2-2105036 Discussion on network-assisted and UE-assisted integrity Huawei, HiSilicon discussion Rel-17 NR\_pos\_enh-Core Withdrawn

[R2-2105218](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2105218%20Discussion%20on%20network-assisted%20and%20UE-assisted%20integrity.docx) Discussion on network-assisted and UE-assisted integrity Huawei, HiSilicon discussion Rel-17 NR\_pos\_enh-Core

[R2-2105308](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2105308%20(R17%20NR%20POS%20WI%20AI8115_GNSS_Integrity).doc) Discussion on procedures and signalling for GNSS positioning integrity InterDigital, Inc. discussion Rel-17

[R2-2105524](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2105524%20Discussion%20on%20supporting%20positioning%20integrity%20in%20RAN.doc) Discussion on supporting positioning integrity in RAN OPPO discussion Rel-17 NR\_pos\_enh-Core

[R2-2105563](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2105563%20Discussion%20on%20signalling%20and%20procedures%20for%20GNSS%20positioning%20integrity.doc) Discussion on signalling and procedures for GNSS positioning integrity Xiaomi discussion

[R2-2105735](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2105735_UE_Integrity_Fraunhofer_Ericsson.docx) UE-aided detection of threat to GNSS systems and assistance data signaling Fraunhofer IIS; Fraunhofer HHI; Ericsson discussion

[R2-2105874](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2105874%20Positioning%20Integrity%20Support%20in%20LPP.docx) Positioning Integrity Support in LPP Nokia, Nokia Shanghai Bell discussion Rel-17 FS\_NR\_pos\_enh

* Revised in R2-2106445

[R2-2106445](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2106445%20Positioning%20Integrity%20Support%20in%20LPP%20(Rev%20R2-2105874).docx) Positioning Integrity Support in LPP Nokia, Nokia Shanghai Bell discussion Rel-17 FS\_NR\_pos\_enh

[R2-2105970](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2105970%20GNSS%20Integrity.docx) On GNSS Integrity Ericsson discussion Rel-17

[R2-2105985](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2105985%20Guiding%20framework%20on%20integrity%20concepts%20for%20A-GNSS%20positioning.docx) Guiding framework on integrity concepts for A-GNSS positioning ESA discussion Rel-17 NR\_pos\_enh

[R2-2106085](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Docs\R2-2106085.zip) Considerations on GNSS positioning integrity support Qualcomm Incorporated discussion

[R2-2106105](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2106105%20-%20Proposals%20on%20GNSS%20Integrity.docx) Proposals on GNSS integrity assistance information Swift Navigation discussion

[R2-2106371](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2106371%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

[R2-2106427](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2106427.docx) Discussion on positioning integrity transportation ZTE Corporation, Sanechips discussion Rel-17 NR\_pos\_enh-Core

[R2-2106428](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2106428.docx) Discussion on positioning integrity data calculation and LS to RTCM ZTE Corporation, Sanechips discussion Rel-17 NR\_pos\_enh-Core

### 8.11.6 A-GNSS enhancements

Including support of BDS B2a and B3I signals and support of NavIC.

To be discussed by email

[R2-2105143](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\37355_CRXXXX_(Rel-17)_R2-2105143.docx) Introduction of B2a signal in BDS system in A-GNSS CATT, CAICT draftCR Rel-17 37.355 16.4.0 B NR\_pos\_enh-Core

[R2-2105972](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2105972%20NavIC%20.docx) Impacts of NavIC in NR RRC Ericsson discussion Rel-17

* [AT114-e][613][POS] Rel-17 A-GNSS enhancements (CATT/Ericsson)

Scope: Discuss the draft CR in R2-2105143 and impact analysis in R2-2105972 and collect company inputs.

Intended outcome: Report in R2-2106581

Deadline: Thursday 2021-05-27 0000 UTC

### 8.11.7 Other

Input on other WI objectives.

Related to LS on DL-AoD enhancement

[R2-2104804](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2104804%20Discussion%20on%20LS%20on%20DL-AoD%20angle%20calculation%20enhancement.docx) Discussion on LS on DL-AoD angle calculation enhancement CATT discussion Rel-17 NR\_pos\_enh-Core

[R2-2104849](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2104849%20Discussion%20on%20DL-AoD%20angle%20calculation%20enhancement.docx) Discussion on DL-AoD angle calculation enhancement vivo discussion NR\_pos\_enh-Core

[R2-2104925](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2104925%20%20DL-AOD.docx) Support of angle calculation enhancement for DL-AoD Intel Corporation discussion Rel-17 NR\_pos\_enh

Other

[R2-2105220](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2105220%20Discussion%20on%20positioning%20enhancement%20v00.docx) Discussion on positioning enhancement Huawei, HiSilicon discussion Rel-17 NR\_pos\_enh-Core

[R2-2105974](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2105974%20Accuracy.docx) On High Accuracy Aspects Ericsson discussion Rel-17

[R2-2106086](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202105%20-%20RAN2_114-e,%20Online\Extracts\R2-2106086_(Reference%20Devices).docx) Signalling and Procedures for supporting Reference Location Devices Qualcomm Incorporated discussion

Withdrawn/Not available

R2-2105038 Discussion on positioning enhancement Huawei, HiSilicon discussion Rel-17 NR\_pos\_enh-Core Withdrawn