3GPP TSG-RAN WG2 Meeting #117-e R2-22xxxxx

Online, 21 February-3 March 2022

Source: Session Chair (MediaTek)

Title: Report from session on positioning and sidelink relay

# 4 EUTRA corrections Rel-15 and earlier

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.

# 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. Please submit CRs marked “NR\_newRAT-Core, TEI16” under one of the below clauses.

Tdoc limitation: AI5 + AI6: 14

## 5.5 Positioning corrections

Corrections to both the stage 2 and stage 3 aspects related to positioning. Stage 2 CRs shall be discussed with the specification rapporteur (Sven Fischer sfischer@qti.qualcomm.com) before submission. Stage 2 CRs not discussed with the specification rapporteur will not be treated.

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

[R2-2202597](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2202597%20Corection%20on%20the%20object%20indentifier%20of%20LPP%20ASN.1%20for%20R15.doc) Corretion on the object identifier of LPP ASN.1 for R15 Huawei, HiSilicon CR Rel-15 37.355 15.2.0 0328 - F NR\_newRAT-Core

* Revised in R2-2203613

[R2-2203613](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2203613%20Correction%20on%20the%20object%20indentifier%20of%20LPP%20ASN.1%20for%20R15.doc) Correction on the object identifier of LPP ASN.1 for R15 Huawei, HiSilicon CR Rel-15 37.355 15.2.0 0328 1 F NR\_newRAT-Core

* Agreed (email discussion [AT117-e][624])

[R2-2202598](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2202598%20Corection%20on%20the%20object%20indentifier%20of%20LPP%20ASN.1%20for%20R16.doc) Corretion on the object identifier of LPP ASN.1 for R16 Huawei, HiSilicon CR Rel-16 37.355 16.7.0 0329 - A NR\_newRAT-Core

* Revised in R2-2203614

[R2-2203614](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2203614%20Correction%20on%20the%20object%20indentifier%20of%20LPP%20ASN.1%20for%20R16.doc) Correction on the object identifier of LPP ASN.1 for R16 Huawei, HiSilicon CR Rel-16 37.355 16.7.0 0329 1 A NR\_newRAT-Core

* Agreed (email discussion [AT117-e][624])

[R2-2202599](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2202599%20Discussion%20on%20the%20object%20identifier%20for%20LPP%20ASN1.docx) Discussion on the object identifier of LPP ASN.1 Huawei, HiSilicon discussion Rel-15 NR\_newRAT-Core

* [AT117-e][624][POS] Agenda item 5.5 (Huawei)

Scope: Treat documents R2-2202597, R2-2202598, and R2-2202599 and conclude on the CRs.

Intended outcome: Agreed CRs (without CB)

Deadline: Wednesday 2022-03-02 1000 UTC

[R2-2203627](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2203627%20Summary%20of%20%5bAT117-e%5d%5b624%5d%5bPOS%5d%20Agenda%20item%205.5%20(Huawei).docx) Summary of [AT117-e][624][POS] Agenda Item 5.5 (Huawei) Huawei, HiSilicon discussion Rel-15 NR\_newRAT-Core

* Noted (email discussion [AT117-e][624])

# 6 Rel-16 NR Work Items

Essential corrections only.

Tdoc Limitation: See common tdoc limitation with AI 5

## 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 by email. No web conference is planned for this agenda item, and non-urgent documents may be postponed to next meeting.

Tdoc Limitation: See tdoc limitation for Agenda Item 6

### 6.3.1 General and Stage 2 corrections

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

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

[R2-2202119](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Docs\R2-2202119.zip) Reply LS to RAN2 on the misalignment in SRS configuration (R3-216009; contact: Samsung) RAN3 LS in Rel-16 To:RAN2 Cc:SA2

* Noted without presentation (email discussion [AT117-e][600])

[R2-2202406](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\38305_CR0085_(Rel-16)_R2-2202406.docx) Miscellaneous corrections in TS 38.305 CATT CR Rel-16 38.305 16.7.0 0085 - F NR\_pos-Core

* Postponed

### 6.3.2 RRC corrections

Including impact to 36.331, 38.331, and 38.306.

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

[R2-2202407](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\38331_CR2890_(Rel-16)_R2-2202407.docx) Corrections on the description of maxNrofSRS-PosResources-1-r16 CATT CR Rel-16 38.331 16.7.0 2890 - F NR\_pos-Core

* Merged into R2-2204027

[R2-2202596](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2202596%20Correction%20on%20srs-PosResourceIdList%20in%20RRC.doc) Correction on srs-PosResourceIdList in RRC Huawei, HiSilicon CR Rel-16 38.331 16.7.0 2897 - F NR\_pos-Core

* Revised in R2-2204027

[R2-2204027](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2204027%20Correction%20on%20Positioning%20SRS.doc) Correction on Positioning SRS Huawei, CATT, HiSilicon CR Rel-16 38.331 16.7.0 2897 1 F NR\_pos-Core

* Agreed (email discussion [AT117-e][625])
* [AT117-e][625][POS] Agenda item 6.3.2 (CATT)

Scope: Treat documents R2-2202407 and R2-2202596 and conclude on the CRs.

Intended outcome: Agreed CRs (without CB)

Deadline: Wednesday 2022-03-02 1000 UTC

[R2-2204085](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2204085%20Report%20of%20%5bAT117-e%5d%5b625%5d%5bPOS%5d%20Agenda%20item%206.3.2%20(CATT).docx) Report of [AT117-e][625][POS] Agenda item 6.3.2 (CATT) CATT discussion Rel-16 NR\_pos-Core

* Noted (email discussion [AT117-e][625])

### 6.3.3 LPP corrections

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

[R2-2202224](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\37355_CR0326_(Rel-16)_R2-2202224%20Missing%20need%20code.docx) Addition of missing need code for the BDS TGD2 parameter Lenovo, Motorola Mobility CR Rel-16 37.355 16.7.0 0326 - F TEI16

* Agreed (email discussion [AT117-e][626])

[R2-2203275](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2203275_(CR%2037355%20Reference%20TRP).docx) Correction of reference TRP for DL-AoD and Multi-RTT measurement report Qualcomm Incorporated CR Rel-16 37.355 16.7.0 0330 - F NR\_pos-Core

* Agreed (email discussion [AT117-e][626])

[R2-2203277](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2203277_(CR%2037355%20DL%20PRS%20Resources%20per%20PFL).docx) Correction to NR-DL-PRS-ResourcesCapability field description Qualcomm Incorporated CR Rel-16 37.355 16.7.0 0331 - F NR\_pos-Core

* Agreed (email discussion [AT117-e][626])

[R2-2203367](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2203367%20LPP%20CR%20GAD.docx) Introducing new high accuracy GAD shape with scalable uncertainty Ericsson, T-Mobile USA CR Rel-16 37.355 16.7.0 0333 - B TEI16

* Revised in R2-2203531

[R2-2203531](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2203531%20LPP%20CR.docx) Introducing new high accuracy GAD shape with scalable uncertainty Ericsson, T-Mobile USA, Qualcomm Incorporated CR Rel-16 37.355 16.7.0 0333 1 F TEI16

* Agreed (email discussion [AT117-e][626])

[R2-2203368](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2203368%20LPP%20CR%20Segmentation.docx) Clarification on LPP segmentation Ericsson CR Rel-16 37.355 16.7.0 0334 - F NR\_pos-Core

* Not pursued (email discussion [AT117-e][626])
* [AT117-e][626][POS] Agenda item 6.3.3 (Ericsson)

Scope: Treat documents R2-2202224, R2-2203275, R2-2203277, R2-2203531, and R2-2203368 and conclude on the CRs.

Intended outcome: Agreed CRs (without CB)

Deadline: Wednesday 2022-03-02 1000 UTC

[R2-2204021](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2204021%20Summary%20of%20LPP%20CRs.docx) Report for LPP Corrections for Positioning Ericsson discussion Rel-16

* Noted (email discussion [AT117-e][626])

### 6.3.4 MAC corrections

# 7 Rel-16 EUTRA Work Items

Only essential corrections. No documents should be submitted to 7. Please submit to 7.x

## 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.

# 8 Rel-17 NR Work Items

## 8.7 NR Sidelink relay

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

Time budget: 2 TU

Tdoc Limitation: 3 tdocs

### 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. For LSes that need action or have impact beyond taking into account by CR rapporteurs: One tdoc by contact company (one company) to address the LS and potential reply is considered Rapporteur Input and may be provided. Related documents and proposed responses from companies other than the contact company should be submitted to the corresponding technical agenda item (and do count towards the tdoc limitation).

Incoming LSs and related documents

[R2-2202127](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2202127_R3-221202.docx) Reply LS for authorization information for 5G ProSe Layer-3 Remote UE (R3-221202; contact: CATT) RAN3 LS in Rel-17 To:SA2, RAN2

* Noted without presentation (email discussion [AT117-e][600])

[R2-2202136](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2202136_R3-221411.doc) LS on mapping configuration of sidelink relay (R3-221411; contact: Samsung) RAN3 LS in Rel-17 To:RAN2

* Noted (handled in email discussion [AT117-e][620])

[R2-2202952](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2202952%20Discussion%20on%20R3%20LS%20on%20mapping%20configuration.doc) Discussion on RAN3 LS on mapping configuration of sidelink relay Samsung discussion Rel-17 NR\_SL\_relay-Core

* [AT117-e][620][Relay] Reply LS to RAN3 on mapping configuration (Samsung)

Scope: Draft a reply to the LS in R2-2202136.

Intended outcome: Approved LS (preferably without CB) in R2-2203599 and report in R2-2203598

Deadline: Thursday 2022-02-24 1200 UTC

[R2-2203598](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2203598%20Summary%20of%20%5bAT117-e%5d%5b620%5d%5bRelay%5d%20Reply%20LS%20to%20RAN3_final.doc) [AT117-e][620][Relay] Reply LS to RAN3 on mapping configuration (Samsung)) Samsung discussion Rel-17 NR\_SL\_relay-Core

* Noted without presentation

[R2-2203599](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2203599_Reply%20LS%20to%20RAN3%20on%20mapping%20configuration%20of%20sidelink%20relay.doc) Reply LS to RAN3 on mapping configuration of sidelink relay Samsung LS out NR\_SL\_relay-Core To:RAN3

* Approved (decision of email discussion [AT117-e][620])

Agreement from email discussion [AT117-e][620]:

It is feasible to use Uu RLC channel ID instead of LCID when configuring “sl-Egress-RLC-Channel-Uu-r17”

Work plan and open issues

[R2-2202201](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2202201%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 without presentation (email discussion [AT117-e][600])

[R2-2202202](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2202202%20-%20Remaining%20open%20issues%20for%20R17%20SL%20relay.docx) Remaining open issues for R17 SL relay OPPO discussion Rel-17 NR\_SL\_relay-Core

* Noted without presentation (email discussion [AT117-e][600])

Running CRs and related documents

38.300

[R2-2202343](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2202343%20Stage%202%20CR%20on%20Introduction%20of%20SL%20Relay.docx) Stage 2 CR on Introduction of R17 SL Relay MediaTek Inc. CR Rel-17 38.300 16.8.0 0403 - B NR\_SL\_relay-Core

* Revised in R2-2203944

[R2-2203944](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2203944%2038.300%20CR(0403)%20on%20Introduction%20of%20SL%20Relay.docx) Stage 2 CR on Introduction of R17 SL Relay MediaTek Inc. CR Rel-17 38.300 16.8.0 0403 1 B NR\_SL\_relay-Core

Discussion:

Ericsson would like to go to post-meeting discussion for this CR. They think the decisions of this session may have stage 2 impact, and there are other decisions of this meeting that companies have not had time to check.

* [Post117-e][602][Relay] Relay CR to 38.300 (MediaTek)

Scope: Update and check the CR in R2-2203944.

Intended outcome: Agreed CR

Deadline: Thursday 2022-03-10 xxxx UTC (for RP)

38.304

[R2-2203324](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\38.304_CR0232(Rel-17)_R2-2203324-%2038.304%20CR%20for%20SL%20relay.docx) 38.304 CR for SL relay Ericsson CR Rel-17 38.304 16.7.0 0232 - B NR\_SL\_relay-Core

* Revised in R2-2203629

[R2-2203629](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\38.304_CR0232(Rel-17)_R2-2203629-%2038.304%20CR%20for%20SL%20relay.docx) 38.304 CR for SL relay Ericsson CR Rel-17 38.304 16.7.0 0232 1 B NR\_SL\_relay-Core

* Agreed

[R2-2203325](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2203325-%20Way%20forward%20on%20open%20issues%20in%2038.304%20for%20SL%20relay.docx) Way forward on open issues in 38.304 for SL relay Ericsson discussion Rel-17 NR\_SL\_relay-Core

[R2-2203628](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2203628-%20%5bAT117-e%5d%5b611%5d%5bRelay%5d%20Way%20forward%20on%20FFSs%20in%2038.304.docx) [AT117-e][611][Relay] Way forward on FFs in 38.304 Ericsson discussion Rel-17 NR\_SL\_relay-Core

Proposal 1 The following editor’s note in 38.304 running CR is removed: “Editor’s Note: FFS whether the U2N Remote UE paging reception when connected to a U2N Relay UE needs to be clarified.”

Proposal 2 It is clarified in a NOTE that the remote UE does not need to monitor PO in order to receive the paging message.

Proposal 3 No new sub-section for sidelink relay is created in Section 8 of TS 38.304.

Proposal 4 The following editor’s note in 38.304 running CR is removed: “Editor’s Note: FFS whether a new section (i.e., Section 9) should be created for NR Sidelink discovery.”

Proposal 5 The following editor’s note in 38.304 running CR is removed: “Editor’s Note: FFS whether U2N Remote UE and/or U2N Relay UE behavior should be captured in this section.”

Discussion:

vivo have a question about the serving cell concept and the acquisition of SIB3/4/5, in relation to P5; they think this issue should be clarified in discussion, but there may not be spec impact.

Ericsson agree that the UE can acquire the SIBs either via direct or indirect link, but we have agreed that when the remote UE is connected via a relay, its serving cell is the serving cell of the relay, so it would not use SIB3/4/5 acquired via the direct link from a different cell; if the relay disappears, the remote UE could apply stored SIB3/4/5. OPPO have the same understanding as Ericsson.

Agreements:

Proposal 1 The following editor’s note in 38.304 running CR is removed: “Editor’s Note: FFS whether the U2N Remote UE paging reception when connected to a U2N Relay UE needs to be clarified.”

Proposal 2 It is clarified in a NOTE that the remote UE does not need to monitor PO in order to receive the paging message.

Proposal 3 No new sub-section for sidelink relay is created in Section 8 of TS 38.304.

Proposal 4 The following editor’s note in 38.304 running CR is removed: “Editor’s Note: FFS whether a new section (i.e., Section 9) should be created for NR Sidelink discovery.”

Proposal 5 The following editor’s note in 38.304 running CR is removed: “Editor’s Note: FFS whether U2N Remote UE and/or U2N Relay UE behavior should be captured in this section.”

38.321

[R2-2202543](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2202543_MAC%20CR%20for%2038.321%20SL%20Relay_clean.doc) Introduction of Sidelink Relay Apple CR Rel-17 38.321 16.7.0 1194 - B NR\_SL\_relay-Core

* Revised in R2-2203946

[R2-2203946](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2203946_MAC%20CR%20for%2038.321%20SL%20Relay_clean.doc) Introduction of Sidelink Relay Apple CR Rel-17 38.321 16.7.0 1194 1 B NR\_SL\_relay-Core

* Agreed

[R2-2203945](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2203945%20Summary%20of%20%5bAT117-e%5d%5b613%5d%5bRelay%5dMAC%20CR%20open%20issues.doc) Report of [AT117-e][613][Relay] Relay running CR to 38.321 (Apple) Apple discussion Rel-17 NR\_SL\_relay-Core

Proposal 1 The change in 5.22.1.2 in MAC CR [1] is not needed.

Proposal 2 For editor’s note in 5.22.1.4 of MAC CR [1], RAN2 can wait for SA2 reply to decide if any further change is needed to ensure UE’s MAC layer not multiplexing SL data and SL discovery in the same MAC PDU.

Proposal 3 No MAC layer change is needed because no PDB restriction for SL-SRB4 is specified.

Proposal 4 No MAC layer change is needed as preemptive BSR is deprioritized.

Proposal 5 Add changes in 6.1.3.33 to support the generation of destination index for SL destinations introduced in Rel-17 SUL message.

Discussion:

Apple clarify that the LS from SA2 has resolved P2 and the EN can be removed.

Agreements:

Proposal 1 The change in 5.22.1.2 in MAC CR [1] is not needed.

Proposal 2 (modified) The editor’s note in 5.22.1.4 of MAC CR [1] can be removed.

Proposal 3 No MAC layer change is needed because no PDB restriction for SL-SRB4 is specified.

Proposal 4 No MAC layer change is needed as preemptive BSR is deprioritized.

Proposal 5 (modified) Add changes in 6.1.3.33 to support the generation of destination index for SL destinations introduced in Rel-17 SUI message.

[R2-2202544](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2202544%20Discussion%20on%20MAC%20CR.doc) Discussion on remaining issues of MAC CR Apple discussion Rel-17 NR\_SL\_relay-Core

38.322/38.323

[R2-2202950](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2202950-CR%230046%20Introduction%20of%20SL%20Relay%20in%2038.322.docx) Introduction of SL Relay in 38.322 Samsung CR Rel-17 38.322 16.2.0 0046 - B NR\_SL\_relay-Core

* Revised in R2-2203965

[R2-2203965](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2203965%20CR%230046%20Introduction%20of%20SL%20relay%20in%2038.322.docx) Introduction of SL Relay in 38.322 Samsung CR Rel-17 38.322 16.2.0 0046 1 B NR\_SL\_relay-Core

* Agreed

[R2-2202951](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2202951-CR%230086%20Introduction%20of%20SL%20Relay%20in%2038.323.docx) Introduction of SL Relay in 38.323 Samsung CR Rel-17 38.323 16.6.0 0086 - B NR\_SL\_relay-Core

* Revised in R2-2203966

[R2-2203966](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2203966%20CR%230086%20Introduction%20of%20SL%20relay%20in%2038.323.docx) Introduction of SL Relay in 38.323 Samsung CR Rel-17 38.323 16.6.0 0086 1 B NR\_SL\_relay-Core

* [Post117-e][603][Relay] Relay CR to 38.323 (Samsung)

Scope: Update and check the CR in R2-2203966.

Intended outcome: Agreed CR

Deadline: Thursday 2022-03-10 xxxx UTC (for RP)

[R2-2203964](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2203964%20%5bAT117-e%5d%5b614%5d%5bRelay%5d%20Summary%20of%20open%20issue%20in%20RLC%20and%20PDCP.doc) [AT117-e][614][Relay] Summary of open issue in PDCP/RLC Samsung discussion Rel-17 NR\_SL\_relay-Core

Proposal: Remove the editor’s note ‘FFS for ARP (Address Resolution Protocol) e.g., use “010” for ARP, no ROHC for ARP, applicable only for NR sidelink communication for groupcast and broadcast’ from PDCP CR and revisit the ARP issue based on CT1 status.

Discussion:

Samsung indicate this issue has been raised with the WI rapporteur to be captured as an open issue.

ZTE indicate that there is another incoming LS from CT1 on other SDU types (R2-2204066). OPPO understand that CT1 just ask whether certain SDU types can be supported in AS layer, so they do not see spec impact from it on our side. Huawei have the same understanding.

ZTE report that CT1 agreed to support additional SDU types. Samsung think we can discuss next quarter.

Agreement:

Proposal (modified): Remove the editor’s note ‘FFS for ARP (Address Resolution Protocol) e.g., use “010” for ARP, no ROHC for ARP, applicable only for NR sidelink communication for groupcast and broadcast’ from PDCP CR and revisit the ARP issue and any other SDU types based on CT1 status.

38.331

[R2-2202819](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2202819_38331_CR%232910_Rel-17_Introduction%20of%20SL%20relay.docx) Introduction of SL relay Huawei, HiSilicon CR Rel-17 38.331 16.7.0 2910 - B NR\_SL\_relay-Core

* Revised in R2-2203943

[R2-2203943](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2203943_38331_CR%232910_Rel-17_Introduction%20of%20SL%20relay.docx) Introduction of SL relay Huawei, HiSilicon CR Rel-17 38.331 16.7.0 2910 1 B NR\_SL\_relay-Core

Discussion:

Ericsson wonder if we will keep open issues in a separate list or ENs in the spec. OPPO think it may make sense to maintain a separate list, which can be consulted also as an input to the ASN.1 review process. Huawei have the same understanding.

* [Post117-e][601][Relay] Relay CR to 38.331 (Huawei)

Scope: Update the CR in R2-2203943.

Intended outcome: Agreed CR

Deadline: Thursday 2022-03-10 xxxx UTC (for RP)

[R2-2202820](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2202820%20Stage3%20open%20issues%20handling%20for%20SL%20relay%20RRC%20CR.docx) Stage3 open issues handling for RRC CR Huawei, HiSilicon discussion Rel-17 NR\_SL\_relay-Core

[R2-2203991](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2203991_Report%20of%20%5bAT117-e%5d%5b615%5d%5bRelay%5d%20Relay%20running%20CR%20to%2038.331.docx) Report of [AT117-e][615][Relay] Relay running CR to 38.331 (Huawei) Huawei, HiSilicon discussion Rel-17 NR\_SL\_relay-Core

[6/10]Propose 1: UE needs to indicate the discovery type when requesting discovery configuration in SUI, to allow network performing authorization and providing dedicated configuration.

Discussion:

Huawei think there may have been some confusion in the discussion of this proposal. They agree that the RAN node does not need to do the authorisation, but it needs to provide proper service based on the authorisation information, and per SA2/RAN3 specs, the direct discovery only covers the non-relay discovery for D2D communication, and relay service covers relay discovery and communication.

LG have some concern and think we need to send an LS to SA2 to clarify if the discovery types are different.

OPPO think RAN2 can take the decision on this and the logic is to use the SUI to provide information to the RAN node. For the authorisation aspect, they understand the existing SA2 LS is clear.

Xiaomi wonder if the only need is to provide resource allocation; they understand we may not need separate resources for direct discovery and relay discovery.

Huawei indicate that the SA2 specification says the direct discovery and relay services are distinct and is clear about what they cover. To Xiaomi’s question, Huawei understand that the network needs the authorisation information to know if the UE is allowed to perform relay or non-relay discovery. There are differences e.g. in the use of the Uu threshold.

Apple think the Uu threshold is the main difference and we could remove ”performing authorisation” from the proposal.

Xiaomi think the network can know the relay capability and provide the threshold based on that. Ericsson agree with Xiaomi and do not see the need for this indication.

Ericsson think the Uu threshold issue was discussed before and we decided the gNB can provide it even if it is not used. LG have the same understanding.

Ericsson understand the email discussion was directed to the need of authorisation, and if we now think that is not needed, it invalidates the question.

Huawei indicate the network needs to know the authorisation of the relay and remote UE, and if the UE is unauthorised for a service, the network will not provide such a service to the UE. For the aspect about the Uu threshold configuration, they understand Xiaomi’s proposal to use the capability does not distinguish between a UE that supports the feature and a UE that performs the feature.

vivo think this is similar to the Rel-10 relay case, where the eNB needed to know that the relay was authorised.

Agreement:

[6/10]Proposal 1 (modified): UE indicates the discovery type when requesting discovery configuration in SUI.

[9/12] Proposal 2: Remote UE shall report source L2 ID to be used to establish PC5 link with L2 relay UE (i.e., used to send DCR message) to network which is to be configured to the target relay UE during path switch

[13/13]Proposal 3: Capture the intiation condition that the UE capable of L2 relay UE or L2 remote UE shall report source L2 ID, including the case of L2 ID changes.

[8/11] Proposal 4: Add a explict indication in SUI for L2 relay UE requesting local UE ID for a remote UE.

Discussion:

LG support P3 but think ”including the case of L2 ID changes” should say ”source L2 ID changes”.

Apple understand for P2 and P3, the UE would only report this in RRC\_CONNECTED and should not transition from idle just to report. Qualcomm agree.

Ericsson wonder if we really need to differentiate the RRC states, because the SUI anyway is sent in RRC\_CONNECTED.

Agreements:

[9/12] Proposal 2 (modified): Remote UE in RRC\_CONNECTED shall report source L2 ID to be used to establish PC5 link with L2 relay UE (i.e., used to send DCR message) to network which is to be configured to the target relay UE during path switch

[13/13]Proposal 3 (modified): Capture the intiation condition that the UE capable of L2 relay UE or L2 remote UE in RRC\_CONNECTED shall report source L2 ID, including the case of source L2 ID changes.

[8/11] Proposal 4: Add a explict indication in SUI for L2 relay UE requesting local UE ID for a remote UE.

38.351

[R2-2202276](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Docs\R2-2202276.zip) Running CR for TS 38.351 OPPO draft TS Rel-17 38.351 0.4.0 NR\_SL\_relay-Core

* Revised in R2-2203594

[R2-2203594](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Docs\R2-2203594.zip) Running CR for TS 38.351 OPPO draft TS Rel-17 38.351 0.4.0 NR\_SL\_relay-Core

* Revised in R2-2203947

[R2-2203947](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Docs\R2-2203947.zip) Running CR for TS 38.351 OPPO draft TS Rel-17 38.351 0.4.0 NR\_SL\_relay-Core

* Agreed

38.306/38.331 capability

[R2-2203519](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\38.306_CR0696(Rel-17)_R2-2203519%20-%2038.306%20CR%20for%20sidelink%20relay%20capabilities.docx) Draft 38.306 CR for sidelink relay UE capabilities Qualcomm Incorporated CR Rel-17 38.306 16.7.0 0696 - B NR\_SL\_relay-Core

* Revised in R2-2203905

[R2-2203905](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\38.306_CR0696(Rel-17)_R2-2203905%20-%2038.306%20CR%20for%20sidelink%20relay%20capabilities.docx) Draft 38.306 CR for sidelink relay UE capabilities Qualcomm Incorporated CR Rel-17 38.306 16.7.0 0696 1 B NR\_SL\_relay-Core

* Revised in R2-2204058

[R2-2204058](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\38.306_CR0696(Rel-17)_R2-2204058%20-%2038.306%20CR%20for%20sidelink%20relay%20capabilities.docx) Draft 38.306 CR for sidelink relay UE capabilities Qualcomm Incorporated CR Rel-17 38.306 16.7.0 0696 2 B NR\_SL\_relay-Core

* Endorsed for merge into mega CR

[R2-2203910](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\38.331_CR2967(Rel-17)_R2-2203910%20-%2038.331%20CR%20for%20sidelink%20relay%20capabilities.docx) Introduction of sidelink relay capability Qualcomm Incorporated CR Rel-17 38.331 16.7.0 2967 - B NR\_SL\_relay-Core

* Revised in R2-2204059

[R2-2204059](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\38.331_CR2967(Rel-17)_R2-2204059%20-%2038.331%20CR%20for%20sidelink%20relay%20capabilities.docx) Introduction of sidelink relay capability Qualcomm Incorporated CR Rel-17 38.331 16.7.0 2967 1 B NR\_SL\_relay-Core

* Endorsed for merge into mega CR

Discussion:

Qualcomm clarify that the late revisions were for coversheet corrections, and the question of how much detail to list for “basic” L2/L3 operation was also raised. They understand that the latter issue can be discussed in ASN.1 review.

Ericsson wonder if we can capture that we will double-check the “basic operation” details in ASN.1 review.

Agreement:

Capability CRs are endorsed in the form of R2-2204058 and R2-2204059. Whether more details are needed for “basic” L2 and L3 relay operation can be further discussed in ASN.1 review.

Agreement:

WI can be closed from RAN2 perspective.

Discussion:

Ericsson wonder if open issues are left, how they will be captured (e.g. in SR). OPPO indicate that there is chair guidance to maintain the open issue list for Q2 discussion and use it as input to the discussion.

Nokia think there should be some official list of issues, for transparency and to clarify why and how much Rel-17 time should be allocated in the corrections phase.

Withdrawn/Not available

R2-2202781 Stage 2 Running CR on Introduction of R17 SL Relay MediaTek Inc. CR Rel-17 38.300 16.8.0 0410 - B NR\_SL\_relay-Core Withdrawn

### 8.7.2 Open issues

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

#### 8.7.2.1 Control plane procedures

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

Including report of [Pre117-e][605][Relay] Open issues on relay control plane procedures (Huawei).

Email discussion report

[R2-2202822](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2202822%20Report%20of%20%5bPre117-e%5d%5b605%5d%5bRelay%5d%20Open%20issues%20on%20relay%20control%20plane%20procedures%20(Huawei).docx) Summary of [Pre117-e][605][Relay] Open issues on relay control plane procedures Huawei, HiSilicon report Rel-17 NR\_SL\_relay-Core Late

Proposals for agreements:

[Easy][23/23] Proposal 3: intraFreqReselection in MIB is not forwarded by relay UE.

[Easy] [23/23] Proposal 4: useT312 cannot be configured to event X1 and X2.

[Easy] [23/23] Proposal 5: useT312 cannot be configured to event Y1 and Y2.

[Easy] [23/23] Proposal 6: PCI is included in suspendConfig (together with C-RNTI).

[Easy] [22/23] Proposal 7: SRAP configuration is not stored in UE Inactive AS context when relay UE/remote UE enters RRC\_INACTIVE state.

[Easy] [18/23] Proposal 8: New RLC configuration is introduced to configure Uu/PC5 RLC channel.

[Easy] [20/23] Proposal 9: Regarding how to allocate LCID for PC5 RLC channel of remote UE Uu RBs including SRB2 and DRBs, RAN2 confirms Rel-16 SL method is reused, i.e. LCID is allocated by UE.

Proposals for discussion:

Cause value:

Proposal 1a: On how to set the cause value in msg3 by relay UE when remote UE’s first RRC message triggers relay UE entering RRC\_CONNECTED state, RAN2 to down select the following solutions: (A new cause value specific to relay case is to be added in RRCSetupRequest/RRCResumeRequest. No new PC5 signalling. No NAS involvement.)

‐ Solution 2.1: The relay UE should set identical cause value as the one received in remote UE’s msg3 except for remote UE’s path switch or remote UE’s RNAU or remote UE’s RRC reestablishment in which cases the relay UE should use a new value.

‐ Solution 3.2: The relay UE should use a new value irrespective of remote UE’s access cause.

Discussion:

Ericsson think there would be NAS involvement if we have a new failure cause.

CATT support solution 3.2.

Intel wonder how the network will determine what priority to assign the connection request based on the new cause value in solution 3.2.

Apple have a concern with solution 3.2 and think it has more inter-layer impact than other solutions.

Nokia have a concern with the new cause value, since there are limited values available. If all the requests from the remote UE have the same cause value, they are concerned that the network cannot differentiate e.g. emergency sessions. They can accept 2.1 but not 3.2. Ericsson agree with Nokia.

MediaTek support solution 3.2 or an implementation solution but not 2.1.

CATT think both options can work but prefer solution 3.2 for layering; they would like to avoid that the relay UE decodes the remote UE’s message.

OPPO cannot accept 2.1; they understand both solutions require a new cause value, but 2.1 involves more effort for the relay UE, and does not allow the gNB to differentiate between the remote UE’s access and the relay UE’s own access.

Intel wonder about solution 2.1: They understand there was a baseline of no new PC5-RRC signalling to pass the cause value, but wonder if there is any problem with using e.g. RRCReconfigurationSidelink for this purpose; they think we could use existing signalling on PC5 in a way that does not trigger the relay’s connection. Apple could accept this suggestion.

LG prefer solution 3.2 or implementation, because in solution 2.1 the relay UE needs to decode the remote UE’s message.

Ericsson are OK with Intel’s suggestion, but think solution 3.2 is not acceptable.

Intel clarify that their suggestion differs from solution 2.1 in that the relay UE is not required to decode the message and it does not require a new cause value on Uu; they think the relay UE could choose an existing cause value for the exceptional cases.

OPPO and MediaTek cannot accept Intel’s suggestion. OPPO see this as not in the spirit of having no new PC5 signalling. They do not see additional benefit of this idea over solution 2.1. MediaTek do not accept the PC5-RRC impact and extra use of PC5 resources.

Ericsson think solution 2.1 can be done without new signalling if the remote UE uses the new cause value in its own Msg3 also. They think the important thing is that the remote and relay UEs use the same cause value.

Xiaomi wonder if we leave it to relay UE implementation, the relay UE would have freedom to set any cause value (e.g. emergency). They do not think it is acceptable if the relay UE can set the emergency value by implementation. Ericsson have the same concern. Apple have the same concern.

OPPO think we relied on implementation in IAB and P1b is a workable compromise.

Show of hands between companies who can accept solutions 2.1 and 3.2:

2.1: 9

3.2: 7

Proposal 1b: If no consensus can be achieved on proposal 1a, it is left to relay UE’s implementation on how to set cause value in its own msg3 when remote UE’s first RRC message triggers relay UE entering RRC\_CONNECTED state. (No new signalling. No RAN2 spec impact.)

Cell barring:

Proposal 2: RAN2 to further discuss how to handle the case when the cellBarred in the MIB is set to barred:

‐ [2/22] Option 1: Relay UE forwards cellBar in the discovery message together with cellAccessRelatedInfo.

‐ [8/22] Option 2: Relay UE does not accept new remote UE’s DCR except the UEs accessing for path switch, and release the PC5 connections with other idle/inactive remote UEs.

‐ Option 3: Leave to network and/or relay UE implementation. RAN2 does not pursue specified solutions in Rel-17.

Discussion:

Ericsson would prefer option 3 with no spec impact. Nokia have a similar view and think the majority was for not forwarding cell barring.

Huawei think only two companies suggested option 3 in the email discussion; they prefer option 1 and think options 2 and 3 both add complexity, but they can accept option 3.

Agreements:

[Easy][23/23] Proposal 3: intraFreqReselection in MIB is not forwarded by relay UE.

[Easy] [23/23] Proposal 4: useT312 cannot be configured to event X1 and X2.

[Easy] [23/23] Proposal 5: useT312 cannot be configured to event Y1 and Y2.

[Easy] [23/23] Proposal 6: PCI is included in suspendConfig (together with C-RNTI).

[Easy] [22/23] Proposal 7: SRAP configuration is not stored in UE Inactive AS context when relay UE/remote UE enters RRC\_INACTIVE state.

[Easy] [18/23] Proposal 8: New RLC configuration is introduced to configure Uu/PC5 RLC channel.

[Easy] [20/23] Proposal 9: Regarding how to allocate LCID for PC5 RLC channel of remote UE Uu RBs including SRB2 and DRBs, RAN2 confirms Rel-16 SL method is reused, i.e. LCID is allocated by UE.

~~A new cause value specific to relay case is to be added in RRCSetupRequest/RRCResumeRequest. No new PC5 signalling. No NAS impact.~~

It is left to relay UE’s implementation on how to set cause value in its own msg3 when remote UE’s first RRC message triggers relay UE entering RRC\_CONNECTED state, with the possible exception of the emergency case (to be discussed offline).

Leave the handling of barred cell to network and relay UE implementation. RAN2 does not pursue specified solutions in Rel-17.

Chair’s Note: The above agreements were edited after the session to correct a copy-paste mistake. The erroneously captured agreement “A new cause value specific to relay case is to be added in RRCSetupRequest/RRCResumeRequest. No new PC5 signalling. No NAS impact.” has been struck out.

* [AT117-e][627][Relay] Remaining issues on control plane (Huawei)

Scope:

* Discuss emergency case for relay UE setting cause value

Intended outcome: Report to CB session in R2-2203942

Deadline: Tuesday 2022-03-01 1200 UTC

[R2-2203942](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2203942%20Report%20of%20%5bAT117-e%5d%5b627%5d%5bRelay%5d%20Remaining%20issues%20on%20control%20plane.docx) Report of [AT117-e][627][Relay] Remaining issues on control plane (Huawei) Huawei, HiSilicon report Rel-17 NR\_SL\_relay-Core

Proposal 1: On top of the agreement that it is left to relay UE’s implementation on how to set cause value in its own msg3 when remote UE’s first RRC message triggers relay UE entering RRC\_CONNECTED state, Relay UE is allowed to set establishmentCause/resumeCause as any existing value, except it can set establishmentCause/resumeCause as emergency/mcs\_PriorityAccess only when emergency/mcs\_PriorityAccess is used by remote UE.

Proposal 2: Capture the output from P1 in a Note in RRC spec.

Discussion:

Huawei clarify P1 was further developed during proposal review.

Ericsson are OK with the proposal, but wonder how the relay UE knows the remote UE’s cause: Does the relay UE need to always decode Msg3 from the remote UE?

Xiaomi think there will be a problem if we rely on relay UE implementation, because the protocol stack indicates that Msg3 is transparent to the relay UE. So they think some guidance in the note is needed.

vivo think relay UE implementation was a compromise between specifying behaviour and having PC5 signalling; they agree with Ericsson but think we can take this as a compromise.

AT&T think the relay node functionality can be managed, and we need to capture the principle now that the emergency cause is important.

FirstNet support the proposal.

OPPO think the current P1 reflects a feasible way forward; on the question of how the relay UE knows the cause value, they think we should stick to the agreement to leave it to implementation, but also think we can have some description in the note with detailed wording to be discussed in CR development.

LG think it can be relay UE implementation and the relay UE can see the cause value on SRB0.

MediaTek also understand that relay UE implementation can handle it.

Huawei think we need to stick to the agreement on UE implementation, and think decoding Msg3 is one way to do it; they do not see a restriction in the protocol stack.

Intel think there could be a security issue if there is a rogue remote UE sending a bad cause value. Chair thinks this may be the same as for a directly connected UE. Intel think it could be more secure to rely on PC5-RRC.

InterDigital are OK with the proposals, but wonder about the wording using “can set” vs. “should set”.

Ericsson are OK with the proposal, but wonder if it works for RRC\_INACTIVE where there is security protection; the relay UE cannot verify the MAC-I. They also think there is a framework discussed in SA3 for encrypting Msg3.

Nokia understand that if we want to mandate relay UE behaviour (“shall not use” certain cause values), it should be normative text. They are OK not to capture the implementation.

Ericsson suggest that we take P1, and the functionality of the UE implementation approach can be checked in the ASN.1 review phase. Chair understands this is business as usual.

Apple understand based on the discussion, the only thing the relay UE can do is read Msg3, so it is not really up to implementation. Xiaomi agree with Apple. Peraton understand that also the remote could indicate with a specific LCID, so they are OK to leave it to implementation; they would also like to include the MPS priority cause.

OPPO think we have done a lot of discussion to reach this point and there was a lot of preference to stick to the agreement on UE implementation.

Qualcomm and Huawei would prefer a note rather than normative text. Kyocera, CATT, LG, and Lenovo also.

Xiaomi, Kyocera, and Intel support including mps-PriorityAccess.

Agreements:

Proposal 1 (modified): On top of the agreement that it is left to relay UE’s implementation on how to set cause value in its own msg3 when remote UE’s first RRC message triggers relay UE entering RRC\_CONNECTED state, Relay UE is allowed to set establishmentCause/resumeCause as any existing value, except it can set establishmentCause/resumeCause as emergency/mcs\_PriorityAccess/mps-PriorityAccess only when emergency/mcs\_PriorityAccess is used by remote UE.

Agenda item summary

[R2-2203591](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2203591%20-%20summary%20of%20%5b616%5d_Control_plane_v01_Rapp.docx) Summary of [Pre117-e][609][Relay] Summary of AI 8.7.2.1 Control plane procedures (InterDigital) InterDigital discussion Rel-17 NR\_SL\_relay-Core

Potentially agreeable:

Recommendation 8: Update the running CR to disable relay UE sending SI update to the remote UE when the remote UE enters RRC\_CONNECTED.

Recommendation 9: Discuss observations 1-3, 6 from R2-2202471 in the running CR discussion.

Recommendation 10: Update the running CR to capture that relay reselection can occur following transmission of the RRCSetupRequest and before the connection is established.

Recommendation 12: Update the running CR to include the PC5-RLC channel configuration and SRAP configuration of the remote UE SRB1 in the RRCSetup message.

Discussion:

OPPO think these recommendations are not needed as agreements and can be directly discussed under the running CR.

Nokia also think it should be handled in the running CR.

ZTE think R12 is separate from the running CR and should be discussed online.

Xiaomi wonder if R8 requires the relay UE to be aware of the remote UE’s RRC state. InterDigital indicate we had agreed last meeting that the RRC state would not be explicitly informed, but the SI forwarding would be disabled when the remote UE is in RRC\_CONNECTED; the proposal is just to capture the existing agreement. OPPO understand this is already in the running CR.

Agreement:

Include the PC5-RLC channel configuration and SRAP configuration of the remote UE SRB1 in the RRCSetup message.

For further discussion:

Recommendation 1: RAN2 discuss whether the remote UE provides the relay UE an indication whether to use the same i\_s to determine the PO in RRC\_INACTIVE as in RRC\_IDLE.

Recommendation 3: A remote UE in RRC\_IDLE/RRC\_INACTIVE receiving NotificationMessageSidelink message with indicationType as relayUE-CellReselection or relayUE-HO and deciding to keep the PC5-RRC connection assumes that a cell reselection occurs. RAN2 discusses how to capture the cell ID acquisition at the remote UE in the running CR if the cell change occurs to the relay.

Recommendation 4: RAN2 discuss whether the relay UE sends notification message to the remote UE upon CHO triggered at the relay UE.

Recommendation 5: RAN2 discuss whether the relay UE sends notification message to the remote UE upon failed re-establishment.

Recommendation 11: RAN2 discuss whether the AS layer sends an indication to upper layer for service request upon reception of a message via SL-RLC0

Recommendation 16: RAN2 discuss whether new triggers for reporting SidelinkUEInformationNR (in addition to legacy triggers) are needed for reporting the source L2 ID by a relay UE.

Discussion:

Ericsson think R16 should be discussed because the existing triggers do not consider relaying. Qualcomm agree.

InterDigital think R3 is also important, but it can be discussed in the running CR.

OPPO think R16 overlaps with R3.1c in the report of [Pre117-e][604]. For R3, they think the first sentence is unavoidable and the remote UE has no other option.

Xiaomi think R5 is important.

ZTE think R11 can be left to UE implementation.

Kyocera agree with Xiaomi about R5.

InterDigital think we could assign these to the running CR discussion explicitly.

Agreement:

The recommendations above (apart from R12) can be raised in the RRC running CR discussion.

The following documents will not be individually treated

[R2-2202184](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2202184%20-%20Remaining%20issues%20on%20control%20plane%20procedure%20of%20L2%20U2N%20relay.doc) Remaining issues on control plane procedure of L2 U2N relay Qualcomm Incorporated discussion NR\_SL\_relay-Core

[R2-2202340](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2202340%20Left%20issue%20of%20control%20plane%20procedure.docx) Left issue on NR sidelink relay control plane procedure OPPO discussion Rel-17 NR\_SL\_relay-Core

[R2-2202344](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2202344.doc) Discussion on notification of cell reselection and HO of a relay UE SHARP Corporation discussion NR\_SL\_relay-Core

[R2-2202345](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2202345.doc) Discussion on SRAP config SHARP Corporation discussion NR\_SL\_relay-Core

[R2-2202357](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2202357.docx) Indication to Upper Layer to Trigger Service Request of L2 Relay CATT discussion Rel-17 NR\_SL\_relay-Core

[R2-2202358](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2202358.docx) Impacts on RAN of AN Release of Relay UE CATT discussion Rel-17 NR\_SL\_relay-Core

[R2-2202379](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2202379%20Further%20discussion%20on%20RRC%20connection%20establishment%20of%20remote%20UE.doc) Further discussion on RRC connection establishment of remote UE ZTE, Sanechips discussion Rel-17

[R2-2202411](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2202411.doc) Remaining open issues on control plane procedures for L2 U2N relay Spreadtrum Communications discussion Rel-17

[R2-2202471](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2202471%20(R17%20SL%20Relay%20SI_AI8721%20CapturingSIAgreements).doc) On Capturing the Agreements Related to SI in the RRC CR InterDigital discussion Rel-17 NR\_SL\_relay-Core

[R2-2202472](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2202472%20(R17%20SL%20Relay%20SI_AI8721%20CauseValue).doc) Cause Value Setting for Connection Establishment for UE to NW Relays InterDigital discussion Rel-17 NR\_SL\_relay-Core

[R2-2202473](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2202473%20(R17%20SL%20Relay%20SI_AI8721%20HandlingNotificationMessageSidelink).doc) Handling the Sidelink Notification Message InterDigital discussion Rel-17 NR\_SL\_relay-Core

[R2-2202567](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2202567.docx) Further Discussion on L2 CP Issue O6.03 vivo discussion

[R2-2202569](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2202569.doc) Draft reply LS on establishment/resume cause value on L2 SL Relay vivo LS out To:CT1 Cc:SA2, RAN3

[R2-2202847](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2202847%20Reflecting%20agreement%20on%20sidelink%20resource%20allocation%20mode%20configuration%20for%20L2%20U2N%20remote%20UE%20in%20RRC%20running%20CR.docx) Reflecting agreement on sidelink resource allocation mode configuration for L2 U2N remote UE in RRC running CR ASUSTeK discussion Rel-17 38.331 NR\_SL\_relay-Core

[R2-2202953](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2202953%20Open%20issue%20on%20SI%20request%20over%20PC5.doc) Open issue on SI request over PC5 Samsung discussion Rel-17 NR\_SL\_relay-Core

[R2-2203135](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2203135%20CauseCode.docx) Considerations on cause codes Nokia, Nokia Shanghai Bell discussion Rel-17 NR\_SL\_relay\_enh-Core

[R2-2203148](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2203148%20Relay%20Connection%20control.doc) Discussion on connection control open issues Xiaomi discussion

[R2-2203178](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2203178%20Remaining%20issues%20on%20CP.doc) Remaining issues on CP Lenovo, Motorola Mobility discussion NR\_SL\_relay-Core

[R2-2203272](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2203272%20Support%20of%20idle%20mode%20relay%20UE%20during%20path%20switch.docx) Support of relay UE in RRC\_IDLE/INACTIVE state during direct to indirect path switching Nokia, Nokia Shanghai Bell discussion NR\_SL\_relay\_enh-Core Late

[R2-2203306](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2203306_SL%20Relay%20access%20cause%20value_Intel.docx) Setting cause value for Relay UE access Intel Corporation discussion Rel-17 NR\_SL\_relay-Core

[R2-2203308](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2203308%20Paging%20impact%20on%20connection%20setup%20latency%20for%20SL%20Relay.docx) Discussion on added latency for paging forwarding Nokia, Nokia Shanghai Bell discussion NR\_SL\_relay-Core

[R2-2203326](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2203326-%20Remaining%20issues%20on%20control%20plane%20for%20L2%20sidelink%20relay.docx) Remaining issues on control plane for L2 sidelink relay Ericsson discussion Rel-17 NR\_SL\_relay-Core

#### 8.7.2.2 Service continuity

Service continuity between Uu and relay paths, limited to intra-gNB cases.

Including report of [Pre117-e][603][Relay] Open issues on relay service continuity (CATT)

Email discussion report

[R2-2202356](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2202356.docx) Report of [Pre117-e][603][Relay] Open Issues on Relay Service Continuity (CATT) CATT report Rel-17 NR\_SL\_relay-Core Late

Potentially easily agreeable:

Proposal 1: [22/23] RAN2 confirm the working assumption of “The gNB can select a relay UE in any RRC state i.e., RRC\_IDLE/INACTIVE/CONNECTED as a target Relay UE when triggering the direct to indirect path switch procedure for the Remote UE by the Remote UE oriented solution, i.e. after receiving the path switch command, Remote UE establishes PC5 link with the Relay UE and sends HO complete message via the Relay UE which will trigger the Relay UE to enter CONNECTED state. ”

Proposal 2: [22/23] For the delivery of RRCReconfigurationComplete message by the Remote UE, default configuration of SL-RLC1 is used for PC5 RLC channel configuration to support RRC\_IDLE/INACTIVE target Relay UE for direct to indirect path switch procedure.

Proposal 4: [18/23]The stop condition of the new T304-like timer in Remote UE is upon successfully sending RRCReconfigurationComplete message (i.e., PC5 RLC acknowledge is received from target relay).

Proposal 5: [19/23] When SL-RSRP of the serving relay is not available, it is up to remote UE’s implementation to measure SD-RSRP.

Agreements:

Proposal 1: [22/23] RAN2 confirm the working assumption of “The gNB can select a relay UE in any RRC state i.e., RRC\_IDLE/INACTIVE/CONNECTED as a target Relay UE when triggering the direct to indirect path switch procedure for the Remote UE by the Remote UE oriented solution, i.e. after receiving the path switch command, Remote UE establishes PC5 link with the Relay UE and sends HO complete message via the Relay UE which will trigger the Relay UE to enter CONNECTED state. ”

Proposal 2: [22/23] For the delivery of RRCReconfigurationComplete message by the Remote UE, default configuration of SL-RLC1 is used for PC5 RLC channel configuration to support RRC\_IDLE/INACTIVE target Relay UE for direct to indirect path switch procedure.

Proposal 4: [18/23]The stop condition of the new T304-like timer in Remote UE is upon successfully sending RRCReconfigurationComplete message (i.e., PC5 RLC acknowledge is received from target relay).

Proposal 5: [19/23] When SL-RSRP of the serving relay is not available, it is up to remote UE’s implementation to measure SD-RSRP.

For further discussion:

Proposal 3: RAN2 to further discuss whether to confirm the working assumption of “UE capability for support by the remote UE of handover to idle/inactive UE.”[13/23] or not [10/23]

Discussion:

OPPO think we should support this as part of the compromise for handover to idle/inactive relay UEs.

Ericsson wonder what the impact for the remote UE to support this would be; they see no need for the capability. Qualcomm indicate that some issues, e.g. P7 below, occur in the idle/inactive case only and would require new implementation by the remote UE.

Lenovo agree with Ericsson. Intel agree with Qualcomm.

Ericsson think the remote UE just needs to accept the path switch command.

Proposal 7: If remote UE identifies the target relay UE has changed its serving cell before path switch, remote UE triggers RRC reestablishment as legacy behavior upon expiry of T304 timer. FFS on how the remote UE identifies that the target relay UE has changed.

Discussion:

Qualcomm think this is a failure case where almost all companies agreed.

Lenovo wonder if a UE capability will resolve P7. Qualcomm understand that the capability can prevent the failure case from occurring for remote UEs that cannot support it.

Xiaomi think P7 is essential to support the path switch to idle/inactive UE, and it is a new UE behaviour, so a capability makes sense.

Ericsson understand that P7 could also happen when the relay UE is connected. Chair understood the network would not trigger the relay UE handover during a path switch. Nokia agree with Ericsson.

Xiaomi think we can remove the FFS in P7 because the cell ID is in the discovery message. Apple think we are not sure how frequently the discovery message is sent; InterDigital have the same concern. Intel think the UE may enter RRC\_CONNECTED after sending the discovery message.

Lenovo think the remote UE has to handle T304 expiry in any case.

Agreements:

Proposal 7 (modified): If remote UE identifies the target relay UE has changed its serving cell before path switch, remote UE triggers RRC reestablishment as legacy behavior upon expiry of T304 timer, at least for the case of relay UE in RRC\_IDLE/RRC\_INACTIVE. To be determined in [AT117-e][621] how the remote UE identifies that the target relay UE has changed cell and if this can occur in RRC\_CONNECTED.

If RRC\_CONNECTED and RRC\_IDLE/RRC\_INACTIVE cases are differentiated, confirm the working assumption of “UE capability for support by the remote UE of handover to idle/inactive UE.” This refers to a capability of the remote UE itself. If they are not differentiated, check the need for a capability in [AT117-e][621].

Proposal 6: RAN2 to further discuss that whether separate threshold is needed for SD-RSRP measurement for the case that when SL RSRP of the serving relay is not available [9/23]or not [14/23].

Discussion:

OPPO think a single threshold is enough. Qualcomm agree.

Apple think if there is only a single threshold, the UE will have to treat the SD-RSRP measurement with the same threshold as SL-RSRP.

LG think if power imbalance does not occur, one threshold is enough.

Agreement:

No separate threshold is needed for SD-RSRP measurement for the case that when SL RSRP of the serving relay is not available (UE treats the SD-RSRP measurement with the same threshold as SL-RSRP).

Proposal 8: When the new T304-like timer is stopped in remote UE but the direct to indirect path switch fails due to IDLE/INACTIVE relay UE fails to establish the connection on Uu hop of indirect path, a similar handling as relay UE’s HO/Uu RLF, i.e.:

-Upon relay UE receives RRCReject or experiences other connection establishment/resume failure, it either triggers PC5-S release or sends notification message indicating Uu RRC connection failure to remote UE.

-PC5-S release or notification message shall trigger remote UE’s RRC reestablishment. But in case of notification, remote UE can choose to keep the current PC5 connection with this target relay, or release the PC5 connection and reselect to other relay.

Agreement:

Proposal 8 above will be handled in [AT117-e][621].

* [AT117-e][621][Relay] Additional issues on service continuity (OPPO)

Scope: Filter the issues raised in company tdocs under agenda item 8.7.2.2, determine if any critical issues need resolution, and attempt to converge on any critical issues.

Intended outcome: Report to Friday online session in R2-2203595

Deadline: Thursday 2022-02-24 1200 UTC

[R2-2203595](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2203595%20-%20Summary%20of%20Service-Continuity%20open%20issues.docx) Summary of [621] OPPO discussion Rel-17 NR\_SL\_relay-Core

For agreement:

Proposal 1 [15/19]: A new cause value to reflect RRC\_IDLE/INACTIVE relay UE’s RRC connection failure should be introduced into PC5-RRC notification message.

Proposal 2 [16/17]: RAN2 confirm RSC definition for L2 Relay is out of RAN2 scope and thus up to SA2 decision.

Proposal 3 [16/20]: RAN2 focus on the scenario where L2 remote UE and L2 relay UE establish a single unicast link (instead of multiple uncast links) in Rel-17.

Proposal 5 [20/20]: Remote UE can identify whether the target relay UE has changed its serving cell based on the existing tools (e.g., discovery message, PC5-RRC notification message), so no need to introduce additional mechanism.

Proposal 6[14/18]: RAN2 confirm “If remote UE identifies the target relay UE has changed its serving cell before path switch, remote UE triggers RRC reestablishment as legacy behaviour upon expiry of T304 timer” is not applicable to RRC\_CONNECTED relay UE. And thus confirm the working assumption of “UE capability for support by the remote UE of handover to idle/inactive UE”.

Proposal 7[20/20]:When the new T304-like timer is stopped in remote UE but the direct to indirect path switch fails due to IDLE/INACTIVE relay UE fails to establish the connection on Uu hop of indirect path, a similar handling as relay UE’s HO/Uu RLF, i.e.: 1) Upon relay UE receives RRCReject or experiences other connection establishment/resume failure, it either triggers PC5-S release or sends notification message indicating Uu RRC connection failure to remote UE; 2) PC5-S release or notification message shall trigger remote UE’s RRC reestablishment. But in case of notification, remote UE can choose to keep the current PC5 connection with this target relay, or release the PC5 connection and reselect to other relay.

Discussion:

vivo would like to understand whether the cause value in P1 would need to be new for each exceptional case or can be combined (or if we leave it to the running CR discussion).

Apple understand that it would be one new cause value, separate from the existing ones. Qualcomm also think this.

Apple think P5 does not address the FFS that gave rise to the question, because it may not allow detection of cell change in a timely way. Ericsson agree with Apple; they are not against the proposal as such but think it does not fully clarify how to use the tools.

OPPO understand that there are different views on the question raised by Apple, with some companies thinking it does not need to be addressed normatively and others wanting some explicit requirement; they think it can be further discussed in the running CR, but we can agree now that no new tools are needed.

Huawei think the case in P5 is rare and it is not important for it to be timely.

LG think under P7, the remote UE implementation can decide whether to send the notification message.

ASUSTeK are OK with P3, but would like to understand the RAN2 view on whether the UE can support multiple PDU sessions over a single unicast link. OPPO understand that the bottleneck would be at the remote UE side, and if we support multiple PC5 links, the network would have to decide how to split the traffic between them; they think in the discussion companies preferred not to support multiple links. Chair understands that the multiple PDU sessions is an SA2 question; Apple understand that there is no SA2 restriction. ASUSTeK would like to capture this view.

ZTE think the capability in P6 is not necessary, and if there only idle/inactive candidate relays available, it does not make sense not to use them.

OPPO think ZTE’s comment relates to the existing agreement that if there is differentiation between idle/inactive and connected, we would confirm the WA.

Nokia are concerned if P6 would prevent handover of an RRC\_CONNECTED UE during path switch. Qualcomm understand that it does not.

Ericsson are OK to have the capability, but think the first part of P6 is not technically correct. They understand that if the connected relay UE is handed over, the remote UE needs to take some action.

For further discussion:

Proposal 4 [13/19]: All NCGIs in relay UE’s discovery message shall be reported in NCGI reporting in case of RAN sharing.

Discussion:

ZTE think SA2 indicated the NCGI will be in the discovery message; they understand that the remote UE can report the NCGI directly in the measurement report but not take it from cellAccessRelatedInfo. So they see the proposal as not necessary.

Nokia preferred option 2 but can live with this proposal. However, they would like to indicate that we decided no further impact from RAN sharing, and now we are further discussing it.

OPPO think the comment from ZTE is not a blocking issue, and the root issue is that people would like to report multiple entries; it is aligning with the running CR in that sense.

Qualcomm think this aligns with the legacy Uu behaviour.

ZTE suggest we change “shall” to “may” and not have it mandatory to report all the NCGIs.

Huawei think we could delete “all”.

OPPO think we should not change “shall” to “may” because it could result in different UE behaviours.

Agreements:

Proposal 1 [15/19]: A new cause value to reflect RRC\_IDLE/INACTIVE relay UE’s RRC connection failure should be introduced into PC5-RRC notification message.

Proposal 2 [16/17]: RAN2 confirm RSC definition for L2 Relay is out of RAN2 scope and thus up to SA2 decision.

Proposal 3 [16/20]: RAN2 focus on the scenario where L2 remote UE and L2 relay UE establish a single unicast link (instead of multiple uncast links) in Rel-17.

Proposal 5 [20/20]: Remote UE can identify whether the target relay UE has changed its serving cell based on the existing tools (e.g., discovery message, PC5-RRC notification message), so no need to introduce additional mechanism.

Proposal 7[20/20]:When the new T304-like timer is stopped in remote UE but the direct to indirect path switch fails due to IDLE/INACTIVE relay UE fails to establish the connection on Uu hop of indirect path, a similar handling as relay UE’s HO/Uu RLF, i.e.: 1) Upon relay UE receives RRCReject or experiences other connection establishment/resume failure, it either triggers PC5-S release or sends notification message indicating Uu RRC connection failure to remote UE; 2) PC5-S release or notification message shall trigger remote UE’s RRC reestablishment. But in case of notification, remote UE can choose to keep the current PC5 connection with this target relay, or release the PC5 connection and reselect to other relay.

Confirm the working assumption of “UE capability for support by the remote UE of handover to idle/inactive UE”.

Proposal 4 [13/19]: All NCGIs in relay UE’s discovery message shall be reported in NCGI reporting in case of RAN sharing.

Other documents

[R2-2202185](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2202185%20-%20Remaining%20issues%20on%20service%20continuity%20of%20L2%20U2N%20relay.doc) Remaining issues on service continuity of L2 U2N relay Qualcomm Incorporated discussion NR\_SL\_relay-Core

[R2-2202341](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2202341%20Left%20issue%20of%20service%20continuity.docx) Left issue on NR sidelink relay service continuity OPPO discussion Rel-17 NR\_SL\_relay-Core

[R2-2202380](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2202380%20Remaining%20issues%20on%20service%20continuity.doc) Remaining issues on service continuity ZTE, Sanechips discussion Rel-17

[R2-2202545](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2202545%20Discussion%20on%20direct%20to%20indirect%20path%20switch.doc) Discussion on remaining issues for direct-to-indirect path switch Apple discussion Rel-17 NR\_SL\_relay-Core

[R2-2202584](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2202584%20Path%20switching%20in%20L2%20U2N%20relay%20v1.0.doc) Path switching in L2 U2N relay case Lenovo, Motorola Mobility discussion Rel-17

[R2-2202738](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2202738_RRC%20corrections%20on%20path%20switch.docx) RRC corrections on path switch NEC Corporation discussion Rel-17 NR\_SL\_relay\_enh-Core

[R2-2202821](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2202821%20Stage%203%20issue%20on%20NCGI%20reporting%20in%20measurement%20result.docx) Stage3 issue on NCGI reporting in measurement result Huawei, HiSilicon discussion Rel-17 NR\_SL\_relay-Core

[R2-2202848](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2202848%20Potential%20issues%20on%20multiple%20PDU%20sessions%20handling%20during%20U2N%20direct%20to%20indirect%20path%20switching.docx) Potential issues on multiple PDU sessions handling during U2N direct to indirect path switching ASUSTeK discussion Rel-17 NR\_SL\_relay-Core

[R2-2203202](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2203202.doc) Service continuity open issues in L2 NR sidelink relay Sony discussion Rel-17 NR\_SL\_relay-Core

#### 8.7.2.3 Adaptation layer design

Including bearer mapping, remote UE identification, security aspects if any.

Including report of [Pre117-e][604][Relay] Open issues on relay adaptation layer (OPPO)

Email discussion report

[R2-2202200](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2202200%20-%20Summary%20of%20open%20issue%20for%20SRAP_Phase-2.docx) Summary of [Pre117-e][604][Relay] Open issues on relay adaptation layer (OPPO) OPPO report Rel-17 NR\_SL\_relay-Core Late

Unanimous:

Recommendation 1 [19/19]: RAN2 confirm the working assumption of ” Remote local UE ID is 8 bits.”

Recommendation 2 [19/19]: RAN2 confirm the working assumption of ” Remote UE ID is always present in PC5 adaptation layer header.”

Recommendation 3-1a-1 [19/19]: L2 relay UE report source L2 ID of relay-related discovery transmission to gNB.

Recommendation 4 [19/19]: When a SRAP Data PDU that contains a UE ID or BEARER ID which is not included in sl-SRAP-Config-Remote (for Remote UE) or sl-SRAP-Config-Relay (for Relay UE) is received, the SRAP entity shall discard the received SRAP Data PDU.

With clear majority (>80% support)

Recommendation 3-2a [18/19]: L2-remote, L2-relay, L3-remote and L3-relay UE report destination L2 ID for discovery transmission. L2-relay-UE, L3-remote-UE and L3-relay-UE report (i.e., except L2-remote-UE) destination L2 ID for established PC5 link for relaying.

Recommendation 3-2b [17/19]: In SUI, when reporting a particular destination L2 ID associated with discovery, RAN2 not pursue explicit relay type indication to differentiate between relay-discovery and non-relay-discovery.

Recommendation 3-2c [16/19]: For the destination L2 ID reporting for discovery and for established PC5 link for relay, add a new IE (i.e., instead of reusing the existing field sl-DestinationIdentity).

Recommendation 3-2e [17/19]: L2 relay-UE not report the updated ID of L2-remote UE of the established PC5 link.

Recommendation 5 [18/19]: For RRC\_INACTIVE / RRC\_IDLE L2-Relay UE, it gets local ID configuration for L2-remote UE during direct-to-indirect switching from network configuration on sl-LocalIdentity-r17.

Recommendation 6 [17/19]: In order for L2-relay UE to differentiate between SRAP data PDU for SRB and DRB if the BEARER ID is 0/1/2/3, for a SRAP Data PDU received from PC5 (or Uu) via sl-Egress-RLC-Channel-Uu (or via sl-Egress-RLC-Channel-PC5), L2-relay UE can know whether it is SRB or DRB based on the associated sl-RemoteUE-RB-Identity.

Discussion:

Huawei think on recommendation 3-2b, if we do not have this differentiation, the network cannot know how to configure the threshold. OPPO understand this was discussed by email and the network has to blindly provide both the relay- and non-relay-related parameters.

ZTE think the wording of R2 should be ”local UE ID”.

Apple wonder on R3-2e, if it results in the remote UE having two IDs after the change, potentially confusing the gNB. ZTE agree with Apple. OPPO indicate that the relay UE anyway has to maintain the mapping for both IDs during the transition period, so from the gNB perspective there is no effort.

Apple think we agreed that the remote UE reports the source L2ID to the gNB directly, and R3-2e seems not consistent with that. OPPO think whether the source ID is reported for the PC5 link is a separate proposal. Ericsson agree with OPPO.

Xiaomi think the WA is not correctly copied in R2. We said ”RAN2 does not pursue procedural impact for handling it beyond P6 of” a document from the previous meeting.

Huawei wonder in R3-2b, how the gNB can know which kind of authorisation to do (relay or non-relay). OPPO understand the authorisation has separate IEs for the two cases, and the gNB can determine on this basis.

Agreements:

Recommendation 1 [19/19]: RAN2 confirm the working assumption of ”Remote local UE ID is 8 bits.”

Recommendation 2 [19/19] (modified): RAN2 confirm the working assumption of ”Remote UE ID is always present in PC5 adaptation layer header.” This refers to the remote local UE ID. No impact to RRC signalling (as indicated in the original WA).

Recommendation 3-1a-1 [19/19]: L2 relay UE report source L2 ID of relay-related discovery transmission to gNB.

Recommendation 4 [19/19]: When a SRAP Data PDU that contains a UE ID or BEARER ID which is not included in sl-SRAP-Config-Remote (for Remote UE) or sl-SRAP-Config-Relay (for Relay UE) is received, the SRAP entity shall discard the received SRAP Data PDU.

Recommendation 3-2a [18/19]: L2-remote, L2-relay, L3-remote and L3-relay UE report destination L2 ID for discovery transmission. L2-relay-UE, L3-remote-UE and L3-relay-UE report (i.e., except L2-remote-UE) destination L2 ID for established PC5 link for relaying.

Recommendation 3-2c [16/19]: For the destination L2 ID reporting for discovery and for established PC5 link for relay, add a new IE (i.e., instead of reusing the existing field sl-DestinationIdentity).

Recommendation 3-2e [17/19]: L2 relay-UE not report the updated ID of L2-remote UE of the established PC5 link.

Recommendation 5 [18/19]: For RRC\_INACTIVE / RRC\_IDLE L2-Relay UE, it gets local ID configuration for L2-remote UE during direct-to-indirect switching from network configuration on sl-LocalIdentity-r17.

Recommendation 6 [17/19]: In order for L2-relay UE to differentiate between SRAP data PDU for SRB and DRB if the BEARER ID is 0/1/2/3, for a SRAP Data PDU received from PC5 (or Uu) via sl-Egress-RLC-Channel-Uu (or via sl-Egress-RLC-Channel-PC5), L2-relay UE can know whether

it is SRB or DRB based on the associated sl-RemoteUE-RB-Identity.

Recommendation 3-2b above to be discussed in the RRC running CR discussion.

For further discussion

Recommendation 3-1a-2 [?/19]: RAN2 discuss whether to report 1) source L2 ID to be used to establish PC5 link with L2 relay UE (i.e., used to send DCR message) or 2) source L2 ID of relay-related discovery transmission to gNB (by assuming it is also the source L2 ID used to send DCR message if model-B discovery is used). And if the latter one is adopted, RAN2 discuss how to handle the case where model-A discovery is used by relay UE.

Recommendation 3-1c [?/19]: Relying RRC running-CR discussion on how to specify the initiation condition for source L2 ID reporting, at least including when source L2 ID is updated.

Recommendation 3-2d: When L2-relay UE report destination L2 ID of peer UE (i.e., ID of L2-remote UE), RAN2 discuss whether to report an indicator on whether local ID allocation is required [2/6] or not [4/6].

Agreement:

Recommendations 3-1a-2, and 3-2d above to be discussed in the RRC running CR discussion.

Other documents

[R2-2202392](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2202392%20Discussion%20on%20SRAP%20for%20L2%20U2N%20relay.DOCX) Discussion on SRAP for L2 U2N relay Huawei, HiSilicon discussion Rel-17 NR\_SL\_relay-Core

[R2-2202429](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2202429%20-%20Remaining%20issues%20of%20the%20adaptation%20layer.docx) Remaining issues of the adaptation layer Ericsson discussion Rel-17 NR\_SL\_relay-Core

[R2-2202675](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2202675%20-%20Remaining%20issues%20on%20adaptation%20layer.doc) Remaining issue on sidelink adaptation layer Qualcomm Incorporated discussion NR\_SL\_relay-Core

[R2-2202897](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2202897%20Discussion%20on%20UE's%20L2%20ID.docx) Discussion on UE's L2 ID Sharp discussion

[R2-2203172](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2203172%20SRAP%20-%20miscellaneous%20issues%20v2.doc) SRAP - miscellaneous issues Samsung Electronics GmbH discussion

Withdrawn/Not available

R2-2202854 SRAP header format design CMCC discussion Rel-17 NR\_SL\_relay-Core Withdrawn

#### 8.7.2.4 QoS

Mechanisms for E2E QoS management.

Including report of [Pre117-e][602][Relay] Open issues on relay QoS (Samsung)

Email discussion report

[R2-2202955](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2202955%20Summary%20of%20Open%20issues%20on%20relay%20QoS.doc) Summary of [Pre117-e][602][Relay] Open issues on relay QoS (Samsung) Samsung discussion Rel-17 NR\_SL\_relay-Core Late

Proposal 4: RAN2 to deprioritize bit rate recommendation procedure via Relay UE in this release.

Proposal 5 (19/20): No dedicated resource is specified at Relay UE for relayed traffic.

Proposal 6 (21/21): UE does not need to report PC5 QoS information in SUI for sidelink discovery.

Proposal 7 (20/20): No PDB restriction is applied for SL-SRB4 when performing MAC PDU transmission.

Discussion:

ZTE think a simple design for RBR could still be done.

Apple think the design cannot necessarily be simple and there are significant issues that would have to be solved. Intel agree. Also CATT, Qualcomm, Huawei, and Xiaomi.

OPPO see it as a similar situation to flow control and pre-emptive BSR, where more details came up in the email discussion.

Agreements:

Proposal 4: RAN2 to deprioritize bit rate recommendation procedure via Relay UE in this release.

Proposal 5 (19/20): No dedicated resource is specified at Relay UE for relayed traffic.

Proposal 6 (21/21): UE does not need to report PC5 QoS information in SUI for sidelink discovery.

Proposal 7 (20/20): No PDB restriction is applied for SL-SRB4 when performing MAC PDU transmission.

* [AT117-e][619][Relay] Flow control and pre-emptive BSR mechanisms (Samsung)

Scope: Discuss P1-P3 of R2-2202955 and determine if agreeable mechanisms can be developed. The features can be considered independently of each other.

Intended outcome: Endorsable TPs to affected specifications; report in R2-2203600

Deadline: Thursday 2022-02-24 1200 UTC

[R2-2203600](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2203600%20Summary%20of%20%5bAT117-e%5d%5b619%5d%5bRelay%5d.doc) [AT117-e][619][Relay] Flow control and pre-emptive BSR mechanisms Samsung discussion Rel-17 NR\_SL\_relay-Core Late

Proposal 1: RAN2 to deprioritize flow control in L2 U2N relay in this release.

Proposal 2: RAN2 to deprioritize pre-emptive BSR in L2 U2N relay in this release.

Discussion:

Ericsson think pre-emptive BSR has the possibility to work with limited specification effort, similar to the IAB solution.

OPPO think we did not identify a detailed solution in the email discussion, and the feature was controversial, so they do not see that it can be easily agreed; they also think there are other ways to reduce latency such as CG.

ZTE also think it is not necessary to introduce the pre-emptive BSR, and there is complexity e.g. in computing the buffer size.

Apple have a similar view to OPPO and ZTE, and think the problem with the SCI-based approach is that the information is not very accurate. For a proper design they see that PC5-RRC impact would be needed.

InterDigital have some sympathy with Ericsson’s comment and think the CG cannot always be relied upon by the network; they think using the SCI as a trigger and leaving the rest to UE implementation would be a simple solution.

vivo think the solution is not simple and the IAB discussion was difficult.

CATT agree with Ericsson.

LG agree with ZTE and OPPO.

Ericsson wonder if we could leave it to ASN.1 review to study how much effort is needed.

Agreements:

Proposal 1: RAN2 to deprioritize flow control in L2 U2N relay in this release.

Proposal 2: RAN2 to deprioritize pre-emptive BSR in L2 U2N relay in this release.

Other documents

[R2-2202339](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2202339%20Left%20issues%20in%20QoS%20for%20layer%202%20relay.docx) Left issue on QoS for layer 2 relay OPPO discussion Rel-17 NR\_SL\_relay-Core

[R2-2202381](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2202381%20Miscellaneous%20issues%20on%20bearer%20mapping%20and%20QoS.doc) Miscellaneous issues on bearer mapping and QoS ZTE, Sanechips discussion Rel-17

[R2-2202428](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2202428%20-%20Aspects%20for%20QoS%20management%20with%20SL%20relay.docx) Aspects for QoS management with SL relay Ericsson discussion Rel-17 NR\_SL\_relay-Core

[R2-2202954](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2202954%20Open%20issue%20on%20new%20code-point%20for%20ARP%20in%20PDCP%20SDU%20type.doc) Open issue on new code-point for address resolution protocol (ARP) in PDCP SDU type Samsung discussion Rel-17 NR\_SL\_relay-Core

#### 8.7.2.5 Discovery and re/selection

Including 5G ProSe Direct Discovery for the non-relaying case. Re-using LTE discovery and re/selection as baseline.

Including report of [Pre117-e][601][Relay] Discovery and relay re/selection (ZTE)

Email discussion report

[R2-2202378](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2202378%20Summary%20of%20%5bPre117-e%5d%5b601%5d%5bRelay%5d%20Discovery%20and%20relay%20re-selection_final.doc) Summary of [Pre117-e][601][Relay] Discovery and relay re-selection (ZTE) ZTE, Sanechips discussion Rel-17 Late

Proposal 2: [18/18] [Easy] Groupcast/broadcast based SL-SRB4 reuses the same RX\_Next\_Reassembly and RX\_Next\_Highest handling as the groupcast/broadcast based NR sidelink communication, and the unicast based SL-SRB4 reuses the same RX\_Next\_Reassembly and RX\_Next\_Highest handling as the unicast based NR sidelink communication.

Proposal 4: [18/18] [Easy] No need to define separate PDCP Data PDU format for unicast SL-SRB4.

Proposal 5: [18/18] [Easy] The initial value of RX\_NEXT/RX\_DELIV for broadcast/groupcast based sidelink discovery is set in the same way as for broadcast/groupcast based sidelink communication, and the initial value of RX\_NEXT/RX\_DELIV for unicast based sidelink discovery is set to 0.

Proposal 7-1: [17/18] [Easy] The non-relay discovery support indication can be included in SIB12.

Proposal 8: [15/17] [Easy] The mobility scaling factor for the U2N relay UE operation threshold conditions is deprioritized in R17.

Agreements:

Proposal 2: [18/18] [Easy] Groupcast/broadcast based SL-SRB4 reuses the same RX\_Next\_Reassembly and RX\_Next\_Highest handling as the groupcast/broadcast based NR sidelink communication, and the unicast based SL-SRB4 reuses the same RX\_Next\_Reassembly and RX\_Next\_Highest handling as the unicast based NR sidelink communication.

Proposal 4: [18/18] [Easy] No need to define separate PDCP Data PDU format for unicast SL-SRB4.

Proposal 5: [18/18] [Easy] The initial value of RX\_NEXT/RX\_DELIV for broadcast/groupcast based sidelink discovery is set in the same way as for broadcast/groupcast based sidelink communication, and the initial value of RX\_NEXT/RX\_DELIV for unicast based sidelink discovery is set to 0.

Proposal 7-1: [17/18] [Easy] The non-relay discovery support indication can be included in SIB12.

Proposal 8: [15/17] [Easy] The mobility scaling factor for the U2N relay UE operation threshold conditions is deprioritized in R17.

* [AT117-e][622][Relay] Remaining issues on discovery and (re)selection (ZTE)

Scope:

* Discuss the “for discussion” proposals from R2-2202378 and attempt to converge.
* Filter the issues raised in company tdocs under agenda item 8.7.2.5, determine if any critical issues need resolution, and attempt to converge on any critical issues.

Intended outcome: Report to Friday online session in R2-2203763

Deadline: Thursday 2022-02-24 1200 UTC

[R2-2203763](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2203763%20Summary%20of%20%5bAT117-e%5d%5b622%5d%5bRelay%5d%20Remaining%20issues%20on%20discovery%20and%20(re)selection%20(ZTE)-final.doc) Summary of [AT117-e][622][Relay] Remaining issues on discovery and (re)selection (ZTE) ZTE, Sanechips discussion Rel-17

Easy proposal which can be agreed without online discussion

Proposal 1: [18/18] [Easy] The Rx PDCP/RLC entity establishment/release processing of sidelink broadcast/groupcast communication is applied to SL-SRB4.

Proposal 3: [15/18][Easy] When the Uu RSRP of relay UE is below the configured minimum threshold or above the configured maximum threshold, it is up to relay UE’s implementation on whether to send the PC5-S link release to remote UE.

Proposals need online discussion

Proposal 2: [For discussion] For the L3 relay indication and relay discovery indication, RAN2 to down-select:

Option 1 [10/18]: L3 relay indication + L2 relay indication+ non-relay discovery

Option 2 [11/18]: Relay discovery indication + L2 relay indication + non-relay discovery indication

Option 3: In addition to non-relay discovery and L2 relay indication, one bit is present when L3-relay is supported. The naming of it (either L3 relay or relay-discovery) is left to the running-CR discussion.

[Chair’s note: The following alternative wording was suggested in email for Option 3:]

In addition to non-relay discovery and L2 relay indication, one more bit is needed for either relay discovery capability or L3 relay AS-layer capability (which RAN2 understand are the same capability). The naming of this bit is left to the running CR discussion.

Discussion:

Apple think we should confirm that there are three cases: no support, L3 only, and L2+L3; they see no support of L2 only. They think the name is not so important.

MediaTek support the proposed alternative wording for option 3.

vivo think option 3 is OK, but they prefer the original wording because it states when the third bit is present; they can accept the modified version.

Samsung support option 3 with the alternative text.

Ericsson preferred option 1, but think option 3 offers a reasonable compromise.

Agreements:

Proposal 1: [18/18] [Easy] The Rx PDCP/RLC entity establishment/release processing of sidelink broadcast/groupcast communication is applied to SL-SRB4.

Proposal 3: [15/18][Easy] When the Uu RSRP of relay UE is below the configured minimum threshold or above the configured maximum threshold, it is up to relay UE’s implementation on whether to send the PC5-S link release to remote UE.

In addition to non-relay discovery and L2 relay indication, one more bit is needed for either relay discovery capability or L3 relay AS-layer capability (which RAN2 understand are the same capability). The naming of this bit is left to the running CR discussion.

Other documents

[R2-2202186](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2202186%20-%20Remaining%20issues%20on%20discovery%20and%20relay%20(re)selection.doc) Remaining issues on discovery and relay (re)selection Qualcomm Incorporated discussion NR\_SL\_relay-Core

[R2-2202412](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2202412.doc) Remaining issues on NotificationMessageSidelink message Spreadtrum Communications discussion Rel-17

[R2-2202568](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2202568.docx) Remaining issues on Discovery and Relay (re)selection vivo discussion

[R2-2202585](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2202585%20Discovery%20and%20Relay%20(re)selection%20in%20L2%20and%20L3%20relay%20case%20v1.0.doc) Discovery and Relay (re)selection in L2 and L3 relay case Lenovo, Motorola Mobility discussion Rel-17

[R2-2202849](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2202849%20Issues%20on%20priority%20between%20PC5%20signalling%20and%20SL%20discovery.docx) Issues on priority between PC5 signalling and SL discovery ASUSTeK discussion Rel-17 38.321 NR\_SL\_relay-Core

[R2-2203233](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2203233%20Discussion%20on%20relay%20re-selection%20and%20discovery.docx) Discussion on relay re-selection and discovery Huawei, HiSilicon discussion Rel-17 NR\_SL\_relay-Core

[R2-2203506](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2203506.docx) Sidelink discovery support as indicated within SIB12 Beijing Xiaomi Mobile Software discussion Rel-17

#### 8.7.2.6 UE capabilities

Including report of [Pre117-e][606][Relay] Open issues on relay UE capabilities (Qualcomm)

Email discussion report

[R2-2202676](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2202676%20-%20Summary%20report%20of%20open%20issues%20on%20relay%20UE%20capabilities%20(Qualcomm).doc) Summary report of offline606 - Open issues on relay UE capabilities (Qualcomm) Qualcomm Incorporated discussion NR\_SL\_relay-Core Late

Proposal 1: Revise the agreement in RAN2#116b-e to separate capabilities for relay and non-relay discovery. And capability of relay discovery includes the support of Uu RSRP triggered relay discovery and/or PC5 RSRP triggered relay (re)selection.

Proposal 2: Postpone the discussion on coupling between different capabilities to ASN.1 review.

Proposal 3 (9/15:2/15): For the agreed capabilities of basic L2 relay UE operation and remote UE operation, they are NOT indicated to peer UE.

Discussion:

vivo wonder if there is any case that the UE supports the relay case but not the non-relay case. Qualcomm understand that companies preferred to have separate capabilities, and if there is coupling it can be discussed later in accordance with P2.

Proposal 4: Discuss online to determine signaling of NR discovery capability between:

• Option 1 (7/15): A list of band combination list, which is similar to Rel-16 sidelink communication band combination list (i.e., supportedBandCombinationListSidelinkEUTRA-NR)

• Option 2 (7/15): A single bit on whether supporting NR discovery

Discussion:

Qualcomm suggested reducing the payload size with a compromise proposal, but it did not attract support. Suggest a show of hands. OPPO agree.

Ericsson think we should avoid optimisations. They do not see the value in option 1 except to optimise for future-proofing.

Show of hands:

Option 1 (list of band combinations): 10

Option 2 (single bit): 5

Ericsson think option 1 is a large signalling burden and they would like to see the technical benefit.

Qualcomm consider that there is some difference between discovery and Rel-16 sidelink communication, e.g., support of HARQ. They agree that the difference is small but see a flexibility benefit.

MediaTek think option 1 can reduce the test effort because it does not force the UE to support discovery in all its sidelink bands.

Agreements:

Proposal 1: Revise the agreement in RAN2#116b-e to separate capabilities for relay and non-relay discovery. And capability of relay discovery includes the support of Uu RSRP triggered relay discovery and/or PC5 RSRP triggered relay (re)selection.

Proposal 2 (modified): Postpone the discussion on coupling between different capabilities.

Proposal 3 (9/15:2/15): For the agreed capabilities of basic L2 relay UE operation and remote UE operation, they are NOT indicated to peer UE.

NR discovery capability is signalled as a list of band combination list, which is similar to Rel-16 sidelink communication band combination list (i.e., supportedBandCombinationListSidelinkEUTRA-NR)

Other documents

[R2-2202359](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2202359.docx) Further Discussion on UE Capability CATT discussion Rel-17 NR\_SL\_relay-Core

### 8.7.3 Other

Any other topics on NR sidelink relay.

## 8.11 NR positioning enhancements

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

Time budget: 2 TU

Tdoc Limitation: 3 tdocs

### 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. For LSes that need action or have impact beyond taking into account by CR rapporteurs: One tdoc by contact company (one company) to address the LS and potential reply is considered Rapporteur Input and may be provided. Related documents and proposed responses from companies other than the contact company should be submitted to the corresponding technical agenda item (and do count towards the tdoc limitation).

Including report of [Pre117-e][613][POS] RAN1 parameter list impact to RRC running CR (Ericsson)

Including report of [Pre117-e][614][POS] Issues requiring RAN1 input (Intel)

Incoming LSs

[R2-2202164](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2202164_R4-2202680.doc) LS on SRS for multi-RTT positioning (R4-2202680; contact: Huawei) RAN4 LS in Rel-17 To:RAN1 Cc:RAN2, RAN3

* Noted without presentation (email discussion [AT117-e][600])

[R2-2202165](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2202165_R4-2202685.doc) Reply LS on reporting of the Tx TEG association information (R4-2202685; contact: Huawei) RAN4 LS in Rel-17 To:RAN1, RAN2 Cc:RAN3

* Noted without presentation (email discussion [AT117-e][600])

[R2-2202166](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2202166_R4-2202686.doc) LS on DRX cycle used in PRS measurement in RRC\_INACTIVE state (R4-2202686; contact: Qualcomm) RAN4 LS in Rel-17 To:RAN2, RAN3 Cc:RAN1

* Noted without presentation (email discussion [AT117-e][600])

[R2-2202169](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2202169_R4-2202780.docx) Reply LS on reporting and definition of DL PRS path RSRP (R4-2202780; contact: Nokia) RAN4 LS in Rel-17 To:RAN1, RAN2

* Noted without presentation (email discussion [AT117-e][600])
* [AT117-e][617][POS] LS to RAN1 on positioning issues needing further input (Intel)

Scope: Draft an LS to RAN1 based on the outcome of [Pre117-e][614], taking into account other issues identified in the pre-meeting discussions where guidance from RAN1 is needed.

Intended outcome: Approvable LS in R2-2203717

Deadline: Wednesday 2022-02-23 0200 UTC

[R2-2203717](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2203717%20Draft%20LS%20to%20RAN1%20on%20positioning%20issues%20needing%20further%20input%20v06.docx) Draft LS to RAN1 on positioning issues needing further input Intel Corporation LS out Rel-17 NR\_pos\_enh-Core To:RAN1 Cc:RAN3

* Approved as R2-2203597

[R2-2203887](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2203887_R1-2202619.docx) Reply LS on the applicability of PRS processing window in RRC\_INACTIVE state (R1-2202619; contact: CATT) RAN1 LS in Rel-17 To:RAN4 Cc:RAN2

* Noted without presentation (email discussion [AT117-e][600])

[R2-2203888](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2203888_R1-2202659.docx) Reply LS on SRS for multi-RTT positioning (R1-2202659; contact: Huawei) RAN1 LS in Rel-17 To:RAN4 Cc:RAN2,RAN3

* Noted without presentation (email discussion [AT117-e][600])

Open issues list

[R2-2202488](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2202488%20Open%20issues%20list%20on%20Rel-17%20positioning%20WI_v04.docx) Open issues list on Rel-17 positioning WI Intel Corporation discussion Rel-17 NR\_pos\_enh-Core

* Noted without presentation (email discussion [AT117-e][600])

Email discussion reports and related documents

[R2-2202492](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2202492_Report%20of%20Pre117-614-P2-v00.docx) Report of [Pre117-e][614][POS] Issues requiring RAN1 input (Intel) Intel Corporation discussion Rel-17 NR\_pos\_enh-Core Late

* Noted (handled in email discussion [AT117-e][617])

[R2-2202493](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2202493%20Draft%20LS%20on%20issues%20requiring%20RAN1%20input%20v03.docx) Draft LS on issues requiring RAN1 input Intel Corporation LS out Rel-17 NR\_pos\_enh-Core To:RAN1 Late

* Noted (handled in email discussion [AT117-e][617])

[R2-2203363](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2203363%20Comments.docx) Report on RAN1 parameter list impact to RRC running CR Ericsson discussion Rel-17 Late

* Noted without presentation (to be taken into account in email discussion [AT117-e][607])

Running CRs and related documents

[R2-2202489](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2202489_Open%20issues%20on%20stage%202%20running%20CR.docx) Open issues on stage 2 running CR Intel Corporation discussion Rel-17 NR\_pos\_enh-Core

[R2-2202490](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2202490-Running%2038.305%20v02.docx) Running 38.305 CR for Positioning WI on RAT dependent positioning methods Intel Corporation draftCR Rel-17 38.305 16.7.0 B NR\_pos\_enh-Core

* Revised in R2-2203605

[R2-2203605](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2203605-Running%2038.305%20v04.docx) Running 38.305 CR for Positioning WI on RAT dependent positioning methods Intel Corporation draftCR Rel-17 38.305 16.7.0 B NR\_pos\_enh-Core

* Endorsed
* [AT117-e][604][POS] RAT-dependent positioning running CR to 38.305 (Intel)

Scope: Review and update the CR in R2-2202490.

Intended outcome: Endorsable CR in R2-2203605

Deadline: Friday 2022-02-25 1000 UTC

[R2-2202861](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2202861%20(Running%20CR%20of%2036_305%20GNSS%20Pos%20Integrity).docx) Running CR of 36.305 for GNSS Positioning Integrity InterDigital, Inc. draftCR Rel-17 36.305 16.4.0 B NR\_pos\_enh-Core

* Revised in R2-2203603

[R2-2203603](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2203603%20(Running%20CR%20of%2036_305%20GNSS%20Pos%20Integrity).docx) Running CR of 36.305 for GNSS Positioning Integrity InterDigital, Inc. draftCR Rel-17 36.305 16.4.0 B NR\_pos\_enh-Core

* Endorsed

[R2-2202862](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2202862%20(Running%20CR%20of%2038_305%20GNSS%20Pos%20Integrity).docx) Running CR of 38.305 for GNSS Positioning Integrity InterDigital, Inc. draftCR Rel-17 38.305 16.7.0 B NR\_pos\_enh-Core

* Revised in R2-2203604

[R2-2203604](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2203604%20(Running%20CR%20of%2038_305%20GNSS%20Pos%20Integrity).docx) Running CR of 38.305 for GNSS Positioning Integrity InterDigital, Inc. draftCR Rel-17 38.305 16.7.0 B NR\_pos\_enh-Core

* Endorsed
* [AT117-e][603][POS] Integrity stage 2 CRs (InterDigital)

Scope: Review and update the following CRs:

* R2-2202861 (integrity introduction to 36.305)
* R2-2202862 (integrity introduction to 38.305)

Intended outcome: Endorsable CRs

Deadline: Friday 2022-02-25 1000 UTC

[R2-2203606](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2203606%20%5bAT117-e%5d%5b603%5d%5bPOS%5d%20Integrity%20stage%202%20CRs%20(InterDigital)_Report.docx) [AT117-e][603][POS] Integrity stage 2 CRs (InterDigital) InterDigital, Inc. discussion Rel-17 NR\_pos\_enh-Core

[R2-2203310](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2203310_(37355%20running%20CR)_v5.docx) Running LPP CR for NR positioning enhancements Qualcomm Incorporated draftCR Rel-17 37.355 16.7.0 B NR\_pos\_enh-Core

* Revised in R2-2203619

[R2-2203619](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2203619_(37355%20running%20CR)_v7.docx) Running LPP CR for NR positioning enhancements Qualcomm Incorporated draftCR Rel-17 37.355 16.7.0 B NR\_pos\_enh-Core

* [AT117-e][606][POS] LPP running CR (Qualcomm)

Scope: Review and update the CR in R2-2203310.

Intended outcome: Endorsable CR in R2-2203619 and report in R2-2203620

Deadline: Friday 2022-02-25 1000 UTC – extended to Wednesday 2022-03-02 1000 UTC

[R2-2203620](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2203620_(%5bAT117-e%5d%5b606%5d%5bPOS%5d_LPP_running_CR_summary.docx) Summary of [AT117-e][606][POS] LPP running CR (Qualcomm) Qualcomm Incorporated discussion

Area ID

Proposal 1 : On the definition of Area-ID downselect from the following Options:

- Option 1: Each TRP in the NR-DL-PRS-AssistanceDataPerTRP-r16 is associated with one or more Area-IDs.

- Option 2: Each Area-ID is associated with one or more Cell-IDs. The Area-ID (with associated Cell-ID list) is defined as a separate IE. FFS where this IE is included in the signalling.

Proposal 2: On the issue of "multiple assistance data instances", downselect from the following options:

- Option 1: Multiple instances of PRS assistance data can already be supported by the current LPP spec. One or more NR-DL-PRS-AssistanceData-r16 elements can be provided in one or more LPP Assistance Data messages.

- Option 2: Multiple instances of PRS assistance data are defined as a new SEQUENCE of multiple NR-DL-PRS-AssistanceData-r16 elements with the new SEQUENCE included in 'method'-ProvideAssistanceData-r16, where 'method' can be DL-TDOA, DL-AoD, Multi-RTT.

Discussion:

Fraunhofer see option 2 as important to provide different instances with different area IDs. Chair understands that with option 1 this can be done in multiple messages.

Qualcomm think option 2 does not work for UE-based: We introduce a new IE listing the cells associated with the assistance data, and this structure does not work for multiple instances together, and it would need to apply to other AD such as PosCalc.

CATT have the same understanding as Qualcomm and think both options work.

Agreement:

RAN2 understand that multiple instances of PRS assistance data can already be supported by the current LPP spec. One or more NR-DL-PRS-AssistanceData-r16 elements can be provided in one or more LPP Assistance Data messages.

On-demand DL-PRS

(easy)

Proposal 3: A pre-defined on-demand DL-PRS configuration can be described with the Rel-16 IEs NR-DL-PRS-PositioningFrequencyLayer-r16 and NR-DL-PRS-Info-r16?

Proposal 4: The "index principle" as currently used for the NR-DL-PRS-AssistanceData is also used for the available on-demand DL-PRS configurations.

In the case of available on-demand DL-PRS configurations for multiple NR positioning methods are provided, the nr-On-Demand-DL-PRS-Configurations need to be present in only one of NR-Multi-RTT-ProvideAssistanceData, NR-DL-AoD-ProvideAssistanceData, or NR-DL-TDOA-ProvideAssistanceData. The applicable configuration is then defined as an index in these ProvideAssistanceData messages.

Proposal 7: The previous agreement is modified as follows [see R2-2203620 for revmarked version]:

To respond to an unfulfilled UE-initiated on-demand PRS request, new new location server error cause values are introduced indicating that on-demand DL-PRS assistance data are not available or not supported.

Proposal 8: The value for maxDL-PRS-Configs-r17 is 8.

Agreements:

Proposal 3 (modified): A pre-defined on-demand DL-PRS configuration can be described with the Rel-16 IEs NR-DL-PRS-PositioningFrequencyLayer-r16 and NR-DL-PRS-Info-r16

Proposal 4: The "index principle" as currently used for the NR-DL-PRS-AssistanceData is also used for the available on-demand DL-PRS configurations.

In the case of available on-demand DL-PRS configurations for multiple NR positioning methods are provided, the nr-On-Demand-DL-PRS-Configurations need to be present in only one of NR-Multi-RTT-ProvideAssistanceData, NR-DL-AoD-ProvideAssistanceData, or NR-DL-TDOA-ProvideAssistanceData. The applicable configuration is then defined as an index in these ProvideAssistanceData messages.

Proposal 7 (modified): The previous agreement is modified as follows [see R2-2203620 for revmarked version]:

To respond to an unfulfilled UE-initiated on-demand PRS request, new location server error cause values are introduced indicating that on-demand DL-PRS assistance data are not available or not supported.

Proposal 8: The value for maxDL-PRS-Configs-r17 is 8.

Proposal 9: RAN2 to discuss and decide whether the value for maxDL-PRS-Configs-r17 supported by a UE can be a UE capability, considering the fact that the pre-defined on-demand DL-PRS configurations can also be included in a posSIB.

Discussion:

Qualcomm understand that the posSIB issue means we would need a minimum UE capability as well as maxDL-PRS-Configs.

Huawei think this is not related to posSIBs, because even if a UE does not support something, the network may broadcast it and the UE will not use it.

Lenovo support having a capability for the maximum configurations.

Qualcomm think we just agreed that the UE is allowed to request only if it receives the pre-defined configurations, so a UE that supports the feature and receives too many configurations via broadcast does not have a clear way to handle them.

GNSS Integrity

Proposal 5: Add the following Notes to the IE GNSS-RealTimeIntegrity:

NOTE 1: If GNSS integrity assistance data are provided (i.e., any of GNSS-Integrity-ServiceParameters, GNSS-Integrity-ServiceAlert, ORBIT-IntegrityParameters, SSR-IntegrityOrbitBounds, CLOCK-IntegrityParameters, SSR-IntegrityClockBounds, SSR-IntegrityCodeBiasBounds, SSR-IntegrityPhaseBiasBounds, STEC-IntegrityParameters, STEC-IntegrityErrorBounds, SSR-GriddedCorrectionIntegrityParameters, TropoDelayIntegrityErrorBounds) the following interpretation of the IE GNSS-RealTimeIntegrity applies:

- Absence of the IE GNSS-RealTimeIntegrity indicates DNU=FALSE according to the Integrity Principle of Operation specified in subclause 8.1.1a of TS 38.305 [40] for all GNSS satellites for which integrity assistance data are provided.

- Presence of the IE GNSS-RealTimeIntegrity for a GNSS satellite and signal combination indicates DNU=TRUE for this GNSS satellite and signal combination according to the Integrity Principle of Operation specified in subclause 8.1.1a of TS 38.305 [40].

NOTE 2: The UE assumes that only those satellites for which the GNSS integrity assistance data are provided are monitored by the network and can be used for integrity related applications.

Proposal 6: The previous agreement is modified as follows [see R2-2203620 for revmarked version]:

Add TIR to the IntegrityInformationRequest-r17 IE. The value range shall be based on table 9.2.4 in TR 38.857.

Proposal 4. For reporting Mode 1, AL and TTA are not needed.

Agreements:

Swift need to check some assumptions on reusing the GNSS-RealTimeIntegrity IE. They think an explicit DNU=FALSE may be needed.

Qualcomm think no ASN.1 change to do this is possible; all we can do is add description. We would have to include a new “good satellite list”.

Agreements:

Proposal 5: Add the following Notes to the IE GNSS-RealTimeIntegrity:

NOTE 1: If GNSS integrity assistance data are provided (i.e., any of GNSS-Integrity-ServiceParameters, GNSS-Integrity-ServiceAlert, ORBIT-IntegrityParameters, SSR-IntegrityOrbitBounds, CLOCK-IntegrityParameters, SSR-IntegrityClockBounds, SSR-IntegrityCodeBiasBounds, SSR-IntegrityPhaseBiasBounds, STEC-IntegrityParameters, STEC-IntegrityErrorBounds, SSR-GriddedCorrectionIntegrityParameters, TropoDelayIntegrityErrorBounds) the following interpretation of the IE GNSS-RealTimeIntegrity applies:

- Absence of the IE GNSS-RealTimeIntegrity indicates DNU=FALSE according to the Integrity Principle of Operation specified in subclause 8.1.1a of TS 38.305 [40] for all GNSS satellites for which integrity assistance data are provided.

- Presence of the IE GNSS-RealTimeIntegrity for a GNSS satellite and signal combination indicates DNU=TRUE for this GNSS satellite and signal combination according to the Integrity Principle of Operation specified in subclause 8.1.1a of TS 38.305 [40].

NOTE 2: The UE assumes that only those satellites for which the GNSS integrity assistance data are provided are monitored by the network and can be used for integrity related applications.

Proposal 6: The previous agreement is modified as follows [see R2-2203620 for revmarked version]:

Add TIR to the IntegrityInformationRequest-r17 IE. The value range shall be based on table 9.2.4 in TR 38.857.

Proposal 4. For reporting Mode 1, AL and TTA are not needed.

[R2-2203362](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2203362%20RAN1%20Param%20CR.docx) RAN1 parameter list impact to RRC running CR Ericsson draftCR Rel-17 38.331 16.7.0 B NR\_pos\_enh-Core Late

* Revised in R2-2203921

[R2-2203921](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2203921.docx) RAN1 parameter list impact to RRC running CR Ericsson draftCR Rel-17 38.331 16.7.0 B NR\_pos\_enh-Core

Merged CRs

36.305

[R2-2202405](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\36%20305_CR0107_(Rel-17)_R2-2202405%7f.docx) Introduction of B2a and B3I signal in BDS system and GNSS Positioning Integrity CATT, CAICT, CMCC, China Telecom, China Unicom, Huawei, HiSilicon, Intel Corporation, ZTE Corporation, CBN, vivo, OPPO, Lenovo, MediaTek Inc, Spreadtrum Communications, Xiaomi. CR Rel-17 36.305 16.4.0 0107 - B NR\_pos\_enh-Core

* Revised in R2-2204097

[R2-2204097](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\36%20305_CR0107r1_(Rel-17)_R2-2204097.docx) Introduction of B2a and B3I signal in BDS system and GNSS Positioning Integrity CATT, CAICT, CMCC, China Telecom, China Unicom, Huawei, HiSilicon, Intel Corporation, ZTE Corporation, CBN, vivo, OPPO, Lenovo, MediaTek Inc, Spreadtrum Communications, Xiaomi. CR Rel-17 36.305 16.4.0 0107 1 B NR\_pos\_enh-Core

* Agreed

38.305

[R2-2202491](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2202491-38.305%20CR%20for%20Positioning%20WI%20-%20v05%20-CL.docx) 38.305 CR for Positioning WI Intel Corporation, CATT, CAICT, CMCC, China Telecom, China Unicom, Huawei, HiSilicon, Intel Corporation, ZTE Corporation, CBN, vivo, OPPO, Lenovo, MediaTek Inc, Spreadtrum Communications, Xiaomi CR Rel-17 38.305 16.7.0 0086 - B NR\_pos\_enh-Core.

* Agreed

Discussion:

Fraunhofer have a comment regarding the preconfiguration assistance data, which was raised in the LPP discussion and suggested for handling in the stage 2 CR instead.

Intel indicate this comment was already captured in the current version.

[R2-2204025](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2204025_Report%20of%20632-v09_Rapp.docx) Report of  [AT117-e][632][POS] Merged CR to 38.305 (Intel) Intel Corporation discussion Rel-17 NR\_pos\_enh-Core

* Noted

37.355

[R2-2203315](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2203315_(37355%20running%20CR)_v10a.docx) Introduction of R17 Positioning Enhancements in LPP, CATT, CAICT, CMCC, China Telecom, China Unicom, Huawei, HiSilicon, Intel Corporation, ZTE Corporation, CBN, vivo, OPPO, Lenovo, MediaTek Inc, Spreadtrum Communications, Xiaomi Qualcomm Incorporated CR Rel-17 37.355 16.7.0 0332 - B NR\_pos\_enh-Core

* Agreed

Discussion:

Qualcomm indicate that the CHOICE structure for the area ID has been reverted to the version from v09 in the email thread, and all other comments have been taken into account. The open issue list is captured in R2-2203950.

Intel have the same understanding that all issues have been addressed and the CR should be agreeable. Input from RAN1 will come next quarter and we can handle it then. On the area ID, they understand that the structure in v09 is aligned with the agreements, and structure changes can be considered in the next quarter.

CATT have a concern on the cell list in v09, because there is only one cell list for the preconfigured assistance data; they think companies should discuss further next meeting in the ASN.1 review.

Qualcomm indicate that the structure in the CR is compatible with the legacy behaviour where we do not have an area ID; a message could be repeated with various area IDs to produce AD valid in multiple areas. Ericsson and Fraunhofer agree.

vivo agree with CATT and think the cell list should be within nr-DL-PRS-AssistanceData.

Qualcomm indicate that there are editor’s notes in this version of the CR in places where input is expected from RAN1.

[R2-2203950](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2203950_(%5bAT117-e%5d%5b606%5d%5bPOS%5d_LPP_running_CR_summary.docx) Summary of [AT117-e][606][POS] LPP running CR (Qualcomm) Qualcomm Incorporated discussion

* Noted

38.331

[R2-2203364](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2203364%20RRC%20For%20Merged%20CR.docx) Introduction of Enhanced Positioning feature Ericsson CR Rel-17 38.331 16.7.0 2952 - B NR\_pos\_enh-Core

* Revised in R2-2203602

[R2-2203602](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2203602%20RRC%20Merged%20CR.docx) Introduction of Enhanced Positioning feature Ericsson CR Rel-17 38.331 16.7.0 2952 1 B NR\_pos\_enh-Core

* Revised in R2-2204022

[R2-2204022](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2204022%20RRC%20Updated%20CR.docx) Introduction of Enhanced Positioning feature Ericsson CR Rel-17 38.331 16.7.0 2952 1 B NR\_pos\_enh-Core

Discussion:

Ericsson indicate some comments on SRS configuration for inactive mode have been received after the upload. The CR indicates the BWP with Point A and some comments indicated this was incorrect.

Ericsson report there are some editor’s notes still.

Huawei have the same comment made by Qualcomm on the email reflector, that point A is not needed because the SRS transmission should be configured in respect to the carrier. They also understand that RAN1 intention was to have the SRS transmission independent of BWP, so we should not have any BWP naming in the configuration. On the uplink carrier, Huawei consider that we should take NUL/SUL into account in the configuration, so the SRS configuration needs to be included for both.

Qualcomm think the original version of the CR reused the BWP IE from the legacy ASN.1, and they understand that this works and nothing more is needed. Huawei have the same understanding.

Intel agree with Qualcomm that we should use the existing BWP IE. They think Huawei’s comments can be addressed in the next meeting.

Agreement:

Revert the SRS configuration for inactive mode to use the legacy BWP IE instead of point A.

* [Post117-e][604][POS] Positioning CR to 38.331 (Ericsson)

Scope: Update and check the CR in R2-2204022.

Intended outcome: Agreed CR

Deadline: Thursday 2022-03-10 xxxx UTC (for RP)

* [AT117-e][607][POS] Positioning running CR to 38.331 (Ericsson)

Scope: Review and update the CR in R2-2203364, including merge of the draft CRs in R2-2203362 and R2-2203445.

Intended outcome: Endorsable CR in R2-2203602

Deadline: Friday 2022-02-25 1000 UTC – extended to Wednesday 2022-03-02 1000 UTC

[R2-2204023](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2204023%20Summary%20.docx) [AT117-e][607][POS] Positioning running CR to 38.331 (Ericsson) Ericsson discussion Rel-17

* Noted

38.321

[R2-2202605](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2202605%20Introduction%20of%20R17%20PositioningEnh%20for%20MAC%20spec.docx) Introduction of R17 PositioningEnh in MAC spec Huawei, HiSilicon CR Rel-17 38.321 16.7.0 1197 - B NR\_pos\_enh-Core

* Revised in R2-2203616

[R2-2203616](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2203616%20Introduction%20of%20R17%20PositioningEnh%20for%20MAC%20spec.docx) Introduction of R17 PositioningEnh in MAC spec Huawei, HiSilicon CR Rel-17 38.321 16.7.0 1197 1 B NR\_pos\_enh-Core

* Revised in R2-2204026

[R2-2204026](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2204026%20Introduction%20of%20R17%20PositioningEnh%20for%20MAC%20spec.docx) Introduction of R17 PositioningEnh in MAC spec Huawei, HiSilicon CR Rel-17 38.321 16.7.0 1197 2 B NR\_pos\_enh-Core

* Agreed

Discussion:

Huawei report a comment was received about merging the MAC CEs for PPW and MG, but they think there are functional differences and it makes sense to have two MAC CEs.

Ericsson wonder if the cell ID is needed in the MAC CE for the PPW; they understand that it is provided in RRC and the identifier can indicate it. Huawei understand that RAN1 have agreed that the PPW is configured in a BWP, so to indicate the PPW and the BWP, a serving cell ID is needed. If we do not want the namespace of the PPW to be per-UE, Huawei think the cell ID is necessary.

ZTE agree there should be two MAC CEs.

Huawei report there are consequences to designing the MAC CE formats from the RAN1 agreements that are still coming in. Intel think if the issue is related to RAN1, we can work on it in the next meeting when the RAN1 input comes in.

* [AT117-e][608][POS] Positioning running CR to 38.321 (Huawei)

Scope: Review and update the CR in R2-2202605.

Intended outcome: Endorsable CR in R2-2203616

Deadline: Friday 2022-02-25 1000 UTC – extended to Wednesday 2022-03-02 1000 UTC

36.331

[R2-2202606](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2202606%20Introduction%20of%20R17%20PositioningEnh%20in%20LTE%20RRC%20spec.docx) Introduction of R17 PositioningEnh in LTE RRC spec Huawei, HiSilicon CR Rel-17 36.331 16.7.0 4762 - B NR\_pos\_enh-Core

* Revised in R2-2203617

[R2-2203617](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2203617%20Introduction%20of%20R17%20PositioningEnh%20in%20LTE%20RRC%20spec.docx) Introduction of R17 PositioningEnh in LTE RRC spec Huawei, HiSilicon CR Rel-17 36.331 16.7.0 4762 1 B NR\_pos\_enh-Core

* Revised in R2-2203625

[R2-2203625](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2203625%20Introduction%20of%20R17%20PositioningEnh%20in%20LTE%20RRC%20spec.docx) Introduction of R17 PositioningEnh in LTE RRC spec Huawei, HiSilicon CR Rel-17 36.331 16.7.0 4762 2 B NR\_pos\_enh-Core

* Agreed
* [AT117-e][609][POS] Positioning running CR to 36.331 (Huawei)

Scope: Review and update the CR in R2-2202606.

Intended outcome: Endorsable CR in R2-2203617

Deadline: Friday 2022-02-25 1000 UTC

Agreement:

WI can be closed from RAN2 perspective.

### 8.11.2 Open issues

No documents should be submitted to 8.11.2. Please submit to 8.11.2.x.

#### 8.11.2.1 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.

Including report of [Pre117-e][607][POS] Open issues on positioning latency enhancements (Huawei)

Email report

[R2-2202604](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2202604%20%5bPre117-e%5d%5b607%5d%5bPOS%5d%20Open%20issues%20on%20positioning%20latency%20enhancements%20(Huawei).docx) Summary of [Pre117-e][607][POS] Open issues on positioning latency enhancements (Huawei) Huawei, HiSilicon discussion Rel-17 NR\_pos\_enh-Core Late

The following proposals are potentially easy to agree

Proposal1: Scheduled location time is an absolute time in LPP spec. (14/15)

Proposal3: The indication of scheduled location time can be based on different time bases. (8/12)

Proposal5: No need to report area ID along with PRS measurement to the LMF if the PRS AD is associated with area ID. (9/10)

Proposal6: areaID can be broadcasted in the system information. (14/15)

Proposal10: eLCID is adopted for UL MAC CE for MG activation/deactivation request and DL MAC CE for MG activation/deactivation command. (13/13)

Proposal14: eLCID is adopted for DL MAC CE for PPW activation/deactivation command. (13/13)

Proposal15: Adopt the 10 milliseconds granularity in the responseTime. (13/13)

Discussion:

vivo think P6 should be further discussed after the definition of validity area; if the validity area does not introduce a new area ID, nothing needs to be broadcasted.

Ericsson think if we have P6, it should be a different posSIB from the assistance data. Qualcomm think this is not a problem since only the UEs with access to the DL-PRS assistance data need to know the area ID.

Agreements:

Proposal1: Scheduled location time is an absolute time in LPP spec. (14/15)

Proposal3: The indication of scheduled location time can be based on different time bases. (8/12)

Proposal5: No need to report area ID along with PRS measurement to the LMF if the PRS AD is associated with area ID. (9/10)

Proposal6 (modified): areaID can be broadcasted in the system information. This has no spec impact if the area ID is defined to be something already broadcasted in the system information. Detailed signalling can be further discussed in the LPP running CR discussion and in the context of defining the area ID.

Proposal10: eLCID is adopted for UL MAC CE for MG activation/deactivation request and DL MAC CE for MG activation/deactivation command. (13/13)

Proposal14: eLCID is adopted for DL MAC CE for PPW activation/deactivation command. (13/13)

Proposal15: Adopt the 10 milliseconds granularity in the responseTime. (13/13)

The following proposals need further confirmation from R2

Proposal7: Multiple instances of PRS assistance data can already be supported by the current LPP spec. (6/10)

Discussion:

Huawei indicate that companies with a concern about this proposal were mainly concerned about the interpretation of the Need ON code and whether an existing instance would be overwritten when a new one is received. Qualcomm understand that this is the same issue with Rel-16 assistance data; if the UE gets new AD for a TRP it has already stored AD for, it will overwrite, and they do not see that this would be different for area ID.

vivo think priority is another issue, since the same pre-configured PRS resource may have different priority in different areas. They think an extra ID would need to be introduced.

CATT understand that priority is at the resource level and the multiple instances are at the area ID level. In their view, if each TRP has an area ID in addition to the existing cell ID, it does not matter if the AD are provided in one message or multiple messages.

Intel think the network can only provide AD for 256 TRPs at once currently, and if the LMF wants to provide more it has to use multiple messages covering more than 256. This means we need to clarify how much AD the UE is expected to store over multiple messages.

ZTE think the number from the proposal is wrong and a majority felt the multiple instances could not be supported. They think if area ID is associated with a TRP rather than a set of AD, this assumption is not needed. Huawei clarify the number was changed based on feedback to the summary of the email discussion.

Apple think if we require the UE to store more than 256 TRPs, it should be a capability.

Lenovo think the amount of AD that the UE can store depends on the width of the coverage for the preconfigured AD as well. Chair understood Intel’s comment was related to the number of TRPs.

Huawei think the capability should be per PRS-ID, not per TRP. They think the current LPP spec is not clear on PRS pre-configuration and some clarification should be done about using the configuration across LPP sessions.

Ericsson think there should be a subscription mechanism as well as a capability.

Qualcomm think overlapping area IDs are possible, i.e., one TRP may belong to multiple areas; so we should have a list of area IDs for each cell ID. There would be multiple PRS-IDs in such a cell, but they should be resolved by the cell ID.

CATT think overlapping area IDs are a special use case and we should define the area ID first. If we have an area ID based on a cell list, they understand that the areas may be isolated. OPPO think there is a question in the overlapping case of which AD should be used.

Qualcomm think there can never be more than 256 PRS-IDs based on the RAN1 definition. We could have AD for more than 256 TRPs, in which case the PRS-ID would be reused and differentiated by the cell ID. They understand that this is already the case in Rel-16. Ericsson agree with Qualcomm.

Agreement:

If the UE receives assistance data for a PRS-ID+cell ID combination for which it has already stored assistance data, it overwrites the stored assistance data. If the UE receives assistance data for a PRS-ID+cell ID for which it has not stored assistance data, it maintains its stored assistance data for other PRS-ID+cell ID combinations.

UE capability for the number of PRS-ID+cell ID combinations for which the UE can store AD.

Proposal2 (typo fixed): R2 to further discuss whether it is necessary to differentiate its UE capability of time bases for different positioning modes. (7/12)

Discussion:

Ericsson think it is not clear why this would be necessary.

Nokia do not see a need for the differentiation and think it has some cost in complexity and test effort. ZTE agree with Nokia.

vivo think the capability should be independent for the location modes.

Qualcomm think we normally have this distinction for other capabilities, e.g. periodic reporting. Intel think the UE could have different time requirements for the two modes.

CATT agree with Qualcomm that it makes sense to have the distinction.

Agreement:

Proposal2 (modified): Differentiate the UE capability of time bases for different positioning modes. (7/12)

Proposal16: Whether and how to capture the stage2 description for the MG/PPW procedure is up to the stage2 CR discussion

The following proposals need further inputs from the other groups:

Proposal9: Wait for R1 inputs on pre-configured positioning MG configuration and up to the RRC rapporteur how to capture in the RRC spec.

Proposal11: Check with R3 whether it is possible that LMF-based MG activation/deactivation request can also be used for configuring R16 measurement gaps.

Proposal13: UE monitors PDCCH during RAR window/msgB window or contention resolution timer for the affected symbols by PPW. Send a LS to R1 for confirmation.

Discussion:

Huawei think P13 should be decided by RAN2 and let RAN1 confirm. They understand it is captured in MAC spec.

Nokia think we should wait for RAN1 and P13 does not affect our decision; they understand that it is already in the LS.

Intel think a majority of companies would like to check P13 with RAN1, although they agree it should ultimately be captured in MAC. On P9, they think there are no new MG patterns agreed in RAN1/4.

Huawei can accept that we ask RAN1 as long as the LS is sent early.

Agenda item summary

[R2-2203592](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2203592-summary-latency-v1.docx) Summary of AI 8.11.2.1 Apple discussion

* Revised in R2-2203596

[R2-2203596](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2203596-summary-latency-v2.docx) Summary of AI 8.11.2.1 Apple discussion

Area ID definition

Proposal 1: Discuss which option(s) for Area ID definition to adopt:

 Option A: a list of cells a UE may camp

 Option B: list of RAN area IDs

 Option C: a new IE defined as an INTEGER (to be broadcast in SI)

Show of hands:

Option A: 11

Option B: 0

Option C: 3

Discussion:

Qualcomm somewhat do not understand the wording of option C, since the original proposal was not tied to broadcast. From an implementation pov in LPP, they see it as straightforward to provide an integer per cell in the AD (option C), and this is functionally equivalent to listing the cells.

Intel think functionally A and C are quite similar, but from a signalling pov we can resolve the details in the LPP CR.

CATT think either A or C is OK, but sending a new value as an area ID is more signalling-efficient. They do not see that we need to agree now to broadcast it in SI.

Nokia think the wording of option C is not totally clear, but if you represent an area with an integer, there has to be some mapping to the geographic area, and they understood the mapping could be in terms of a list of cells or other representation.

Apple understood that there was a majority for the list of cells in the show of hands. vivo agree.

Intel think we can rely on the running CR discussion.

CATT still have a concern about the cell list.

Agreements:

An area ID corresponds to a set of cells on which the UE may use the associated AD. Downselect from the following options:

1. Explicitly list the involved cell IDs in LPP along with the assistance data
2. Broadcast in each cell one or more area IDs that are then referred to in LPP.

Resolve this signalling question in the LPP running CR (coordinating with RRC if necessary).

Validity time

Proposal 2: Discuss whether to introduce the validity time for assistance data.

Explicit modification/release of pre-configured assistance data

Proposal 3: Explicit modification/release of pre-configured assistance data (AD) is not introduced in Rel-17; when a new AD is provided to the UE for a given area ID, the UE shall discard the old AD and use the newly received AD.

UL MAC CE for MF activation and deactivation

Proposal 4.1: Agree that UL MAC CE for MG activation and deactivation is triggered by upper layers.

Proposal 4.2: Discuss whether to specify conditions for triggering UL MAC CE for MG activation and deactivation or to leave it for UE implementation.

Proposal 4.3: Discuss whether to define LPP signaling for LMF to indicate to UE whether to send/not send the UL MAC CE for positioning MG activation request.

Proposal 4.4: Discuss whether to define the priority for the MAC CE below the MAC CE for BSR (with exception of BSR included for padding) and above the PHR MAC CE?

Proposal 4.5: Discuss which of the following options to cancel a triggered UL MAC CE for MG activation and deactivation should be captured in the spec?

a) When the MAC CE is transmitted

b) When a downlink command from gNB to activate or deactivate the gaps is received

c) When a new measurement gap configuration from the network is received

d) When a request from upper layers to transmit a new request to gNB for a new/modified gap configuration is received

e) When an indication from upper layers that the gaps are not needed any more or a gap with a new id needs to be activated is received

f) On MAC reset

Proposal 4.8: Discuss whether to adopt a common MAC CE design for PPW and Measurement gap.

Inter-group proposals on pre-configured MG

Proposal 4.6: Discuss whether to liaise RAN1 to confirm the pre-MG is configured to specific UE after LMF receives the location request for the UE?

Proposal 4.7: Discuss whether to liaise RAN3 to specify the unified NRPPa procedure including the assistance data from LMF to gNB to help with the activation/deactivation of pre-configured MG and PRS processing window?

Discussion:

Intel indicate that P4.6 is not already covered in the LS to RAN1, but they think it is a strange question. For P4.7, they think it is RAN3 business.

Huawei think for P4.6, if the pre-configured MG is only configured after the UE request, there is no latency reduction.

Indication in RRC configuration

Proposal 4.9: Discuss whether the gNB should provide Measurement Gap config ID to be activated as part of pre-configuration or any RRC Reconfiguration.

* [AT117-e][628][POS] Remaining proposals from latency reduction summary (Apple)

Scope: Filter remaining proposals from R2-2203596 to determine which issues are critical to resolve, and progress towards consensus on critical issues.

Intended outcome: Report to Monday CB session in R2-2203622

Deadline: Friday 2022-02-25 1200 UTC

[R2-2203622](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2203622-offline-latency-moderator-summary-v0.docx) [AT117-e][628][POS] Remaining proposals from latency reduction summary (Apple) Apple discussion

Notes from the moderator:

• No need to spend online time on proposals 4.4 and 4.6 which simply suggest handling the topic in the running CR discussion

• The only proposal with unanimous consensus is 4.1, is to probably can be skipped as well (it is perhaps obvious anyway)

Proposal 1: to explicitly list the involved cell IDs in LPP along with the assistance data; whether the “area ID” (integer value) should be added as well can be discussed in the running CR discussion.

Proposal 2: validity timer for AD is not introduced in Rel-17.

Discussion:

Qualcomm think we discussed P1 in the running CR, but it should really be decided in the session and is not really an LPP implementation issue.

Apple clarify that no company was proposing to broadcast the area ID, and a majority want to list cell IDs; in addition, some companies want to have an area ID defined in LPP, but not broadcast.

CATT think there is no need to broadcast the area ID; it is just an identity for the cell list. They see no RRC impact, and they think the area ID can be defined just as an identifier that can be used to refer to a cell list. Qualcomm agree with CATT.

CATT understand that the serving cell can be associated with a TRP ID that is associated with an area ID.

Ericsson agree that the area ID can consist of a group of cells, and the UE will infer it based on the TRP ID and which cells are part of the same area, but they do see some effort for the UE to parse the related information.

Huawei can accept not to specify area ID now, and think we should use cell ID instead of NCGI. They see no need to indicate the PLMN.

Qualcomm thought the area ID proposal was straightforward: A cell may belong to an area and the rest is network implementation. They do not understand the cell list proposal in terms of what the UE will do with it. Chair understood that the intention was to list cells where the assistance data is valid.

OPPO think the discussion on validity area has taken a long time and we can settle on a cell ID list and postpone other area ID concepts.

Apple understand that the list is the cells a UE may camp on and use the AD. They agree with Qualcomm: We add a new IE for the list of cells along with the PRS AD.

Intel are OK with this way forward, in which we agree to the cell list now and come back if we identify a signalling problem. They do want to know if the list is per AD group, per TRP, etc; their view is that it should be per group of AD.

Fraunhofer agree with Apple and think the list is per instance of multiple AD.

Nokia think the cell list is not optimal. They see that there could just be a cell broadcast area ID and leave the rest to network implementation.

Qualcomm think if we take this proposal there is no way to change back, and they do not understand why this is so complicated. They think the existing area ID from LPP (indicated per TRP) can be used in the DL-PRS AD.

OPPO have a concern about P2; they think a validity timer could be beneficial for the UE in terms of reducing effort for checking the validity area.

Intel think there is no consensus for the validity timer.

Agreements:

Proposal 1 (modified): Explicitly list the involved cell IDs in LPP along with the assistance data. The list can be provided per instance of assistance data. Can be discussed in running CR/ASN.1 whether there are signalling optimisations that improve this approach.

Proposal 2: validity timer for AD is not introduced in Rel-17.

Proposal 4.1: UL MAC CE for MG activation and deactivation is triggered by upper layers.

Proposal 4.2: conditions for triggering UL MAC CE for MG activation and deactivation are not specified.

Proposal 4.3: LPP signalling for LMF to indicate to UE whether to send/not send the UL MAC CE for positioning MG activation request is not defined.

Proposal 4.5: the following options to cancel a triggered UL MAC CE for MG activation and deactivation should be captured in the spec; other options can be discussed in the running CR discussion.

• When the MAC CE is transmitted

• When a request from upper layers to transmit a new request to gNB for a new/modified gap configuration is received

• When an indication from upper layers that the gaps are not needed any more or a gap with a new id needs to be activated is received

• On MAC reset

Discussion:

Huawei think the condition for triggering the UL MAC CE should be specified; currently we have an agreement that both the RRC message and the MAC CE can be used, and we cannot leave the choice to implementation.

Intel think it is strange that we would not specify the condition for triggering the UL MAC CE.

Nokia agree with Huawei.

CATT agree that we need to specify the condition.

Intel suggest we reuse the existing RRC condition, and add that if the preconfigured MG exists, the UE uses UL MAC CE. Huawei think if there is a preconfigured MG, the UE can select between RRC and MAC.

CATT wonder if there is a preconfigured measurement gap, whether the UE will always use it or still has a choice to request a separate MG. Huawei understand that it is up to the network, in that a UE can make the request but it is finally the network decision if the UE uses a certain MG or not.

OPPO think it should be UE implementation to use the preconfigured MG or a new one.

Agreements:

For triggering condition for the UL MAC CE, reuse current RRC condition for Rel-16 PRS gap request, taking into account preconfigured MG. If the preconfigured MG is there and can satisfy the UE’s requirement, the UE uses MAC CE, otherwise RRC message as in Rel-16. The selection is specified in RRC. Reuse the “not configured or not sufficient” language from Rel-16.

Proposal 4.1: UL MAC CE for MG activation and deactivation is triggered by upper layers.

Proposal 4.3: LPP signalling for LMF to indicate to UE whether to send/not send the UL MAC CE for positioning MG activation request is not defined.

Proposal 4.5: the following options to cancel a triggered UL MAC CE for MG activation and deactivation should be captured in the spec; other options can be discussed in the running CR discussion.

• When the MAC CE is transmitted

• When a request from upper layers to transmit a new request to gNB for a new/modified gap configuration is received

• When an indication from upper layers that the gaps are not needed any more or a gap with a new id needs to be activated is received

• On MAC reset

Proposal 4.7: to discuss whether gNB should provide Measurement Gap config ID to be activated as part of pre-configuration or any RRC Reconfiguration.

Discussion:

Ericsson indicate the proposal was that the network can indicate to the UE to use a previously preconfigured MG configuration in any RRCReconfiguration.

Intel understand that RAN1 did not agree RRC-based activation/deactivation.

[For running CR discussions]

Proposal 4.4: priority for the MAC CE can be discussed in the running CR discussion.

Proposal 4.6: the issue of common MAC CE design for PPW and Measurement gap to continue in the running CR discussion.

Discussion:

Huawei think the priority cannot be part of the running CR discussion because it cannot be discussed in isolation. For P4.6, they think there is no RAN1 or RAN2 agreement on a common MAC CE for this, so by default we would not do it; they also think there is motivation to have separate MAC CEs because there can be multiple PPWs but only a single MG.

Huawei understand that MAC CE priority is discussed in the main session and will be further pursued.

Intel agree with Huawei.

Ericsson think we should settle the priority and think we are the only WI that introduced a new MAC CE. Huawei think new LCs also need to be considered (e.g. RedCap) and other UL MAC CEs have been introduced in other WIs.

The following documents will not be individually treated

[R2-2202408](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2202408%20Discussion%20and%20TP%20on%20areaID%20for%20Latency%20enhancements.docx) Discussion and TP on areaID for Latency enhancements CATT discussion Rel-17 NR\_pos\_enh-Core

[R2-2202487](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2202487.docx) On Latency Reduction open issues Intel Corporation discussion Rel-17 NR\_pos\_enh-Core

[R2-2202592](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2202592-positioning-latency-v0.docx) On remaining issues for latency improvements Apple discussion

[R2-2202603](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2202603%20Remaining%20issues%20on%20latency%20and%20accuracy%20enhacnement.docx) Remaining issues on latency and accuracy enhacnement Huawei, HiSilicon discussion Rel-17 NR\_pos\_enh-Core

[R2-2202858](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2202858%20(R17%20NR%20POS%20WI_AI81121_Latency).doc) Remaining Issues on Latency Reduction InterDigital, Inc. discussion Rel-17 NR\_pos\_enh-Core

[R2-2202922](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2202922%20MAC%20CE%20for%20pre-MG%20(de)activation%20request.docx) MAC CE for pre-MG (de)activation request Samsung discussion Rel-17 NR\_pos\_enh-Core

[R2-2202930](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2202930%20Remaining%20issue%20on%20positioning%20latency%20reduction.doc) Remaining issue on positioning latency reduction Xiaomi discussion

[R2-2203042](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2203042_MultiplePreconfiguredAssistanceData.docx) Way forward for preconfigured assistance data Fraunhofer IIS; Fraunhofer HHI; Ericsson; discussion

[R2-2203088](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2203088%20Discussion%20on%20Latency%20enhancements.docx) Discussion on latency enhancement vivo discussion Rel-17 NR\_pos\_enh-Core

[R2-2203181](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2203181%20Discussion%20on%20open%20issues%20of%20positioning%20latency%20enhancements.docx) Discussion on open issues of positioning latency enhancements ZTE discussion

[R2-2203204](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2203204_Pos_latency.docx) Considerations on positioning measurement report latency Sony discussion Rel-17 NR\_pos\_enh-Core

[R2-2203211](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2203211%20Discussion%20of%20positioning%20latency%20enhancement%20open%20issues.docx) Discussion of positioning latency enhancement open issues OPPO discussion Rel-17 NR\_ENDC\_SON\_MDT\_enh-Core

[R2-2203360](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2203360%20RRC%20and%20MAC%20CE%20design.docx) TP on RRC Impacts and MAC CE design Ericsson discussion Rel-17

#### 8.11.2.2 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.

Including report of [Pre117-e][609][POS] Open issues on positioning in RRC\_INACTIVE (InterDigital)

Email report

[R2-2203524](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2203524_Pre117%20POS%20609_Open%20issues%20on%20positioning%20in%20RRC_INACTIVE%20(InterDigital)_Report.docx) Email discussion Report on [Pre117-e][609][POS] Open issues on positioning in RRC\_INACTIVE (InterDigital) InterDigital, Inc. discussion Rel-17 NR\_pos\_enh-Core

Potentially easy to agree

Proposal 6: TA timer configuration of SRS for positioning (SRSp) is invalidated upon any cell reselection (i.e. even if the UE does not initiate the RRC resume procedure) (11/12)

Proposal 7: Follow CG-SDT solution for (a) RSRP derivation for positioning SRS TA validation, and (b) definition of stored downlink pathloss reference RSRP value at the very first positioning SRS transmission (12/12)

Agreements:

Proposal 6: TA timer configuration of SRS for positioning (SRSp) is invalidated upon any cell reselection (i.e. even if the UE does not initiate the RRC resume procedure) (11/12)

Proposal 7: Follow CG-SDT solution for (a) RSRP derivation for positioning SRS TA validation, and (b) definition of stored downlink pathloss reference RSRP value at the very first positioning SRS transmission (12/12)

Proposal 2: Agree on Low Power Periodic and Triggered 5GC-MT-LR Procedure with SDT (in R2-2203443) for UL-only and UL+DL positioning in RRC\_INACTIVE as baseline for Stage 2 discussion

Proposal 1: Add clarification note (as below) in Stage 2 specification:

Note: Positioning may be performed when a UE is in RRC\_INACTIVE state. Any uplink LCS or LPP message can be transported in RRC\_INACTIVE. 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 for positioning, if UL positioning is 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).

Discussion:

Qualcomm think the last sentence of the note describes existing behaviour and we do not need to capture it.

Agreements:

Proposal 2: Agree on Low Power Periodic and Triggered 5GC-MT-LR Procedure with SDT (in R2-2203443) for UL-only and UL+DL positioning in RRC\_INACTIVE as baseline for Stage 2 discussion

Proposal 1: Add clarification note (as below) in Stage 2 specification:

Note: Positioning may be performed when a UE is in RRC\_INACTIVE state. Any uplink LCS or LPP message can be transported in RRC\_INACTIVE. 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 for positioning, if UL positioning is supported) to the UE.

Need further discussion

Proposals related to capturing Stage 2 details

Proposal 3: (Tentative) Send LS to SA2 to let SA2 decide the spec impacts on Low Power Periodic and Triggered 5GC-MT-LR Procedures with SDT for DL-only and RAT-Independent positioning (based on agreed baseline from RAN2#115-e), for UL-only positioning, and for UL+DL positioning (baseline based on R2-2203443)

Discussion:

Qualcomm think we should capture only the NOTE from P1 and send this LS to SA2.

Agreement:

Send LS to SA2 to let SA2 decide the spec impacts on Low Power Periodic and Triggered 5GC-MT-LR Procedures with SDT for DL-only and RAT-Independent positioning (based on agreed baseline from RAN2#115-e), for UL-only positioning, and for UL+DL positioning (baseline based on R2-2203443)

* [AT117-e][629][POS] LS to SA2 on RRC\_INACTIVE positioning (Qualcomm)

Scope: Draft an LS to SA2 indicating our agreements on Low Power Periodic and Triggered 5GC-MT-LR Procedures with SDT for DL-only and RAT-Independent positioning (based on agreed baseline from RAN2#115-e), for UL-only positioning, and for UL+DL positioning (baseline based on R2-2203443), and asking them to take it into account. Include also the information that we have agreed to have RRC state not visible to LMF.

Intended outcome: Approved LS (preferably without CB)

Deadline: Wednesday 2022-03-02 0200 UTC

Proposals related to SP-SRSp activation/deactivation

Proposal 4: Support the following options for activation of SP-SRSp transmission in RRC INACTIVE:

- Option a: If there is ongoing SDT, the network can send SRS activation command to the UE in INACTIVE. Otherwise, the network shall transition the UE to RRC\_CONNECTED.

- Option b: Send the Activation MAC CE along with the SRSp configuration when gNB releases the UE to RRC\_INACTIVE

Proposal 5: Support the following for deactivation of SP-SRSp transmission in RRC INACTIVE:

- If gNB chooses to send the SP-SRSp deactivation command to the UE in INACTIVE, gNB can send SP-SRSp deactivation command to the UE if there is ongoing SDT; otherwise, the gNB transitions the UE to RRC\_CONNECTED for sending the SP-SRSp deactivation command

- If gNB chooses not to send the SP-SRSp deactivation command to the UE in RRC\_INACTIVE, the gNB only waits for the TA timer to expire

Discussion:

Ericsson think “otherwise, the gNB transitions the UE to RRC\_CONNECTED” in P5 just describes a legacy behaviour. They have a similar concern for option a of P4. Huawei agree with Ericsson.

Intel agree with Ericsson and think we could also delete the second bullet of P5 as network implementation. ZTE agree with Intel.

CATT wonder on P4 if it should be captured in stage 2. They think it is network implementation without stage 3 impact. Intel think we should not capture it in stage 2 because we agreed to just capture a note, and there will be impact to SDT discussion. Ericsson and Huawei think we agreed to follow SDT decisions, but Huawei do not see what the impact is.

Intel understand that SDT session did not allow the network to send the SRS activation command via SDT, and we need them to clarify that this is allowed. Huawei think if there is an ongoing SDT session, the lower layer transport can carry anything.

Ericsson think this should have been done in SDT session and they think this issue has not been touched there.

InterDigital and OPPO have the same understanding as Huawei.

Agreements:

Proposal 4 (modified): Support the following options for activation of SP-SRSp transmission in RRC INACTIVE:

- Option a: If there is ongoing SDT, the network can send SRS activation command to the UE in INACTIVE.

- Option b: Send the Activation MAC CE along with the SRSp configuration when gNB releases the UE to RRC\_INACTIVE

Proposal 5 (modified): Support the following for deactivation of SP-SRSp transmission in RRC INACTIVE:

- If gNB chooses to send the SP-SRSp deactivation command to the UE in INACTIVE, gNB can send SP-SRSp deactivation command to the UE if there is ongoing SDT.

- If gNB chooses not to send the SP-SRSp deactivation command to the UE in RRC\_INACTIVE, no additional mechanism is specified (i.e. the gNB can only wait for the TA timer to expire)

Proposals from companies’ contributions on open issues

Proposal 8: TA Timer for SRS for positioning is restarted upon reception of TA command in RRC\_INACTIVE state

Proposal 9: SRS-config is replaced with SRSPosResourceSet and SRSPosResource in RRCRelease with Suspend Config for positioning

Proposal 10: SRS for positioning in RRC\_INACTIVE state can only be configured through RRC release message

Discussion:

Qualcomm think P10 contradicts our earlier agreement to allow configuration via other RRC messages. Huawei and Intel understand that it is not possible to configure this via RRCReconfiguration, by agreement of the SDT session. Qualcomm think MsgB/Msg4 of RACH SDT could carry other RRC messages.

* [AT117-e][630][POS] Remaining proposals on RRC\_INACTIVE (InterDigital)

Scope:

* Discuss P8 and P10 of R2-2203524 and attempt to reach consensus.
* Check the LS in R2-2202166 and determine if there is impact to our specs.

Intended outcome: Report to Monday CB session in R2-2203607

Deadline: Friday 2022-02-25 1200 UTC

[R2-2203607](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2203607%20AT117-e630POS%20Remaining%20proposals%20on%20RRC_INACTIVE%20(InterDigital)_Report.docx) Email discussion Report on [AT117-e][630][POS] Remaining proposals on RRC\_INACTIVE (InterDigital) InterDigital, Inc. discussion Rel-17 NR\_pos\_enh-Core

Potentially easy to agree

Proposal 1: Follow SDT solution that the TA Timer for SRS for positioning (SRSp) is restarted upon reception of TA command in RRC\_INACTIVE (10/10)

Proposal 2: Follow SDT solution that SRS for positioning (SRSp) in RRC\_INACTIVE state can only be configured through RRC Release message (i.e. RRCReconfiguration and RRCReconfigurationComplete are not used for configuring SRSp) (10/10)

Proposal 3: No specification impacts are identified by RAN2 in Rel-17 for handling the relationship between DRX cycle and positioning measurement delay requirements in RRC\_INACTIVE (8/10)

Agreements:

Proposal 1: Follow SDT solution that the TA Timer for SRS for positioning (SRSp) is restarted upon reception of TA command in RRC\_INACTIVE (10/10)

Proposal 2: Follow SDT solution that SRS for positioning (SRSp) in RRC\_INACTIVE state can only be configured through RRC Release message (i.e. RRCReconfiguration and RRCReconfigurationComplete are not used for configuring SRSp) (10/10)

Proposal 3: No specification impacts are identified by RAN2 in Rel-17 for handling the relationship between DRX cycle and positioning measurement delay requirements in RRC\_INACTIVE (8/10)

[R2-2203948](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2203948_(%5bAT117-e%5d%5b629%5d%5bPOS%5d_RRC_INACTIVE)_summary.docx) Summary of [AT117-e][629][POS] LS to SA2 on RRC\_INACTIVE positioning (Qualcomm) Qualcomm Incorporated discussion

* Noted (email discussion [AT117-e][629])

[R2-2203949](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2203949_(LS%20to%20SA2%20on%20RRC_INACTIVE).docx) LS on Positioning in RRC\_INACTIVE State Qualcomm Incorporated LS out Rel-17 NR\_pos\_enh To:SA2 Cc:RAN3

* Approved (email discussion [AT117-e][629])

Other documents

[R2-2202338](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2202338-%20Discussion%20on%20remaining%20issues%20for%20Positioning%20in%20RRC_INACTIVE%20state.docx) Discussion on remaining issues for Positioning in RRC\_INACTIVE state OPPO discussion Rel-17 NR\_pos\_enh-Core

[R2-2202601](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2202601%20Remaining%20Issues%20on%20RRC_INACTIVE%20Positioning.docx) Remaining Issues on RRC\_INACTIVE Positioning Huawei, HiSilicon discussion Rel-17 NR\_pos\_enh-Core

[R2-2202602](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2202602%20Draft%20LS%20to%20SA2%20on%20RRC_INACTIVE%20Positioning.docx) Draft LS on Positioning in RRC\_INACTIVE State Huawei, HiSilicon LS out Rel-17 NR\_pos\_enh-Core To:SA2 Cc:RAN3

[R2-2203089](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2203089%20Discussion%20on%20positioning%20in%20RRC_INACTIVE.docx) Discussion on positioning in RRC\_INACTIVE vivo discussion Rel-17 NR\_pos\_enh-Core

[R2-2203091](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2203091%20Consideration%20on%20the%20Configuration%20of%20UL%20positioning%20in%20RRC_INACTIVE.docx) Consideration on the configuration of UL positioning in RRC\_INACTIVE CATT discussion Rel-17 NR\_pos\_enh-Core

[R2-2203180](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2203180%20Discussion%20on%20UL%20positioning%20configuration%20in%20RRC_INACTIVE.docx) Discussion on UL positioning configuration in RRC\_INACTIVE ZTE discussion

[R2-2203443](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2203443_(Positioning%20in%20RRC_INACTIVE).docx) Remaining issues for positioning of UEs in RRC\_INACTIVE State Qualcomm Incorporated discussion

[R2-2203444](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2203444_(LS%20to%20SA2%20on%20RRC_INACTIVE).docx) [draft] LS on Positioning in RRC\_INACTIVE State Qualcomm Incorporated LS out Rel-17 NR\_pos\_enh R2-2200961 To:SA2 Cc:RAN3

[R2-2203445](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2203445%20RAT-D%20CR.docx) Capturing RRC impacts for RAT dependent Positioning Ericsson draftCR Rel-17 38.331 16.7.0 B NR\_pos\_enh-Core R2-2202048

=> Revised in R2-2203922

[R2-2203922](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2203922.docx) Capturing RRC impacts for RAT dependent Positioning Ericsson draftCR Rel-17 38.331 16.7.0 B NR\_pos\_enh-Core R2-2202048

#### 8.11.2.3 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.

Including report of [Pre117-e][608][POS] Open issues on on-demand PRS (Lenovo)

Email report

[R2-2202236](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2202236_%5bPre117-e%5d%5b608%5d%5bPOS%5d%20Open%20issues%20on%20on-demand%20PRS%20(Lenovo)_v16_Summary.docx) Report of [Pre117-e][608][POS] Open issues on on-demand PRS Lenovo, Motorola Mobility discussion Rel-17 NR\_pos\_enh-Core Late

Easy Agreements (Clear Majority)

Proposal 4: UE may explicitly request on-demand PRS parameters based on the Rel-16 value ranges. [14/14]

Proposal 6: A UE reason/cause for an on-demand PRS request is not supported. [12/14]

Proposal 7: The posSI message cannot be the response for a UE’s On-Demand PRS request. [13/14]

Proposal 8: RRM measurements do not need to be transmitted as part of the LCS MO-LR message. [13/14]

Proposal 12: The DL-PRS-Configuration ID is only defined by an identifier (ID). [13/14]

Proposal 13: On-demand PRS configuration is at least provided per positioning method. [12/14]

Discussion:

Nokia think in P8, it is possible to send a measurement as part of MO-LR. Chair understands the proposal is about RRM measurements, vs. positioning measurements.

CATT and Huawei have the same understanding as Nokia. CATT also support P13, and further think that hybrid positioning should be considered.

Lenovo clarify on P8, it is intended to say that we do not add any measurements for the on-demand procedure. Intel point out the summary indicates the existing mechanism may be used.

Nokia wonder if there is anything specific to the on-demand procedure in the MO-LR.

Agreements:

Proposal 4: UE may explicitly request on-demand PRS parameters based on the Rel-16 value ranges. [14/14]

Proposal 6: A UE reason/cause for an on-demand PRS request is not supported. [12/14]

Proposal 7: The posSI message cannot be the response for a UE’s On-Demand PRS request. [13/14]

Proposal 12: The DL-PRS-Configuration ID is only defined by an identifier (ID). [13/14]

Proposal 13: On-demand PRS configuration is at least provided per positioning method. [12/14]

Reasonable support (Potential to be agreed)

On-demand PRS Request:

Proposal 5: The UE may indicate its preferred on-demand PRS pre-defined configuration via a list in decreasing order of preference (i.e., sorted from the UE’s most preferred to least preferred on-demand PRS configuration). [10/14]

Proposal 3: UE may explicitly request one or more the of the on-demand PRS parameters as provided in the RAN1 parameter list. [9/14]

Discussion:

vivo think P3 should have the restriction that the parameters are permitted by the network.

Ericsson wonder if “configurations offered by the network” refers only to predefined configurations.

CATT think P5 is in conflict with our previous agreement that the UE can request one configuration. Chair understands this would extend the previous agreement.

Qualcomm think on P3, the “configurations signalled by the network” part is not necessary and the proposal does not really add to what we agreed last meeting.

Ericsson think P3 is what we agreed previously and the UE may overload the network with explicit requests.

Lenovo understood from the discussion that once we have the explicit request, either we have the blind request, or we allow the explicit request of parameters already supported in the predefined configurations.

Qualcomm did not have this interpretation and think the network should not announce predefined configurations and have the UE request variations of them.

Agreement:

Proposal 5: The UE may indicate its preferred on-demand PRS pre-defined configuration via a list in decreasing order of preference (i.e., sorted from the UE’s most preferred to least preferred on-demand PRS configuration). [10/14]

Capability:

Proposal 14: UE-initiated on-demand PRS capability information is independently requested per positioning method. More than one capability per positioning method may be provided to the LMF based on the applicable request. [9/14]

Discussion:

Huawei understand the PRS can be different for different positioning methods, but think different methods have the same PRS processing capability and wonder if there is a need for separate on-demand capability. Ericsson agree with Huawei.

Nokia think the second sentence of P14 should say the capability for UE-initiated on-demand PRS request is per positioning method.

Lenovo indicate the intention was that the LMF can request capability for multiple positioning methods associated to a UE.

Qualcomm think we need this proposal from an LPP point of view, but we may not need to decide now if the UE has to set the same value if multiple methods are requested. They think we can discuss further if there should be some constraint for the UE to send the same response for different methods (as we did for some other capabilities). Intel agree with Qualcomm. Huawei understand this was done because the capabilities were mandatory in Rel-16 and we should avoid doing it in Rel-17.

Nokia suggest we could agree that the capability is per positioning method, and discuss the multiple request later.

Agreement:

Proposal 14 (modified): UE-initiated on-demand PRS capability information is independently requested/indicated per positioning method.

UE-initiated On-demand PRS Request Management and Control:

Proposal 9-1: To respond to an unfulfilled UE-initiated on-demand PRS request, an error cause may be provided to the UE. [6/14]

Proposal 9-2: To control the number of UE-initiated on-demand PRS requests, a timer may be configured (e.g., prohibit timer, reattempt timer). [6/14]

Discussion:

Lenovo clarify P9-1 was based on the running CR discussion and they did not see a big concern on it.

Intel understand that we do not need to introduce a new error cause value but can use existing cause values.

Huawei think P9-1 is already in the running CR and should be OK to confirm. For P9-2, they think there is a backward compatibility issue because the new timer will be applied for the whole Request Assistance Data message, and it is not in style with the LPP spec. Intel also think we do not generally have prohibit timers in LPP. Ericsson and Qualcomm agree with Huawei.

Qualcomm agree that P9-1 is existing functionality; the draft CR has new error causes, which may not be strictly needed but they see as helpful to the UE. They think the feature works without P9-2.

ZTE agree with P9-1 and think it should be clear if we have a new error cause, it is only used for explicit parameter request.

Agreement:

Proposal 9-1 (modified): To respond to an unfulfilled UE-initiated on-demand PRS request, an error cause may be provided to the UE. To be discussed under running CR if the cause values are new or if we reuse existing values.

Requires Further Discussion

On-demand PRS Request:

Proposal 1: RAN2 to further discuss the need for blind on-demand PRS request support for UE-initiated on-demand PRS.

Discussion:

Ericsson think from network perspective, it is better to have measurements than UE preferences. They see the explicit request as needed only when the network has not given pre-defined configurations.

Qualcomm think any AD request in LPP is “blind”, and the question is whether there is a need to depart from this principle for on-demand PRS. If we constrain when the UE can send the Request Assistance Data, it would be a behavioural change in LPP.

* [AT117-e][631][POS] Remaining OD-PRS issues (Lenovo)

Scope: Discuss P1/P3/P15-1 of R2-2202236 and attempt to converge on the OD-PRS request behaviour.

Intended outcome: Report to Monday CB session in R2-2203601

Deadline: Friday 2022-02-25 1200 UTC

Agreement:

P11/P15-2/P15-3 to be discussed in the running CR discussion.

Proposal 3 (modified): UE may explicitly request one or more the of the on-demand PRS parameters as provided in the RAN1 parameter list as a delta to a pre-defined configuration. [9/14]

Maximum number of On-demand PRS Configurations and Capability:

Proposal 11: The maximum number of on-demand PRS configurations, i.e., maxDL-PRS-Configs-r17 signalled to the UE is to be specified. RAN2 to further discuss the value of maxDL-PRS-Configs-r17.

Proposal 15-1: RAN2 to further discuss the following UE behavioural options upon receiving pre-defined configurations from the network:

• Option A: UE discards the pre-defined on-demand PRS configuration, after sending its preferred configuration(s).

• Option B: UE stores the pre-defined on-demand PRS configuration(s) until the LPP session ends or is overridden by a new set of on-demand PRS configuration(s)

Proposal 15-2: The maxDL-PRS-Configs-r17 defines the number of pre-defined on-demand PRS configurations that may be stored based on the UE’s capability.

Proposal 15-3: If the network provides a set of on-demand PRS configurations that exceed the maxDL-PRS-Configs-r17, a UE error is sent to the LMF and it is up to UE implementation on how to handle it.

Proposals to be noted

Proposal 2: The network is aware of UE-initiated on-demand PRS support via the previous RAN2#116bis-e agreement on introducing LPP capability for UE-initiated On-Demand PRS Request.

Proposal 10: The provision of a partial on-demand PRS configuration is up to network deployment/implementation.

Proposal 16: Association of pre-defined PRS configurations to positioning QoS is not considered in Rel-17.

[R2-2203601](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2203601_%5bAT117-e%5d%5b631%5d%5bPOS%5d%20Open%20issues%20on%20OD-PRS%20(Lenovo)_v12_FinalReport.docx) Report on [AT117-e][631][POS] Remaining OD-PRS issues (Lenovo) Lenovo, Motorola Mobility discussion Rel-17 NR\_pos\_enh-Core

Compromised Proposal

Proposal 1-1:

• If the NW has provided the pre-defined on-demand PRS configurations to the UE, explicit parameter requests from the UE are allowed provided that the request is within the scope of the received pre-defined on-demand PRS configurations.

• If the NW has not provided the pre-defined on-demand PRS configurations to the UE, the UE may blindly request on-demand PRS parameters via an explicit request within the scope of the RAN1 agreed parameter list.

Proposal 1-2: Add a Stage 2 note clarifying the difference between index-based and explicit-based on-demand PRS requests.

Discussion:

Ericsson think for the explicit indication, it would be nice if the network had some control, but they can live with the compromise.

ZTE indicate the current pre-defined request is index-based, and they prefer to separate the explicit and index-based mechanisms. They can follow the majority view.

Easy to Agree

Proposal 2: On-demand PRS configuration is defined with a Need ON tag, i.e., no new additional behaviours are required.

Agreements:

Proposal 1-1:

• If the NW has provided the pre-defined on-demand PRS configurations to the UE, explicit parameter requests from the UE are allowed provided that the request is within the scope of the received pre-defined on-demand PRS configurations.

• If the NW has not provided the pre-defined on-demand PRS configurations to the UE, the UE may blindly request on-demand PRS parameters via an explicit request within the scope of the RAN1 agreed parameter list.

Proposal 1-2: Add a Stage 2 note clarifying the difference between index-based and explicit-based on-demand PRS requests.

Proposal 2: On-demand PRS configuration is defined with a Need ON tag, i.e., no new additional behaviours are required.

Other documents

[R2-2202337](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2202337%20-%20Discussion%20on%20remaining%20issues%20for%20on-demand%20DL-PRS.doc) Discussion on remaining issues for on-demand DL-PRS OPPO discussion Rel-17 NR\_pos\_enh-Core

[R2-2202409](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2202409%20Discussion%20on%20the%20remaining%20issues%20of%20on-demand%20PRS.docx) Discussion on the remaining issues of on-demand PRS CATT discussion

[R2-2202859](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2202859%20(R17%20NR%20POS%20WI_AI81123_OnDemandPRS).doc) Remaining Issues for On-demand PRS InterDigital, Inc. discussion Rel-17 NR\_pos\_enh-Core

[R2-2203169](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2203169%20(8.11.2.3)_Remaining%20issue%20for%20on-demand%20DL%20PRS.docx) Remaining issues for the On demand DL PRS Samsung R&D Institute UK discussion

[R2-2203463](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2203463%20On-demand%20PRS%20Open%20Issues_clean.docx) On-demand PRS Open Issues Nokia, Nokia Shanghai Bell discussion Rel-17 NR\_pos\_enh-Core

#### 8.11.2.4 GNSS positioning integrity

Signalling and procedures to support GNSS positioning integrity determination.

Including report of [Pre117-e][610][POS] Open issues on GNSS positioning integrity (ESA)

Email report

[R2-2203525](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2203525%20Summary%20of%20%5bPre117-e%5d%5b610%5d%5bPOS%5d%20Open%20issues%20GNSS%20integrity%20(ESA).docx) [Pre117-e][610][POS] Open issues on GNSS positioning integrity (ESA) ESA discussion Rel-17 NR\_pos\_enh-Core

Potentially easy (described as “Agreed in principle” in report)

Open Issue #1:

Proposal 1. For the purpose of GNSS integrity feature added in Release17, use GNSS-RealTimeIntegrity IE to signal to UE bad satellites (and GNSS constellations).

Proposal 2. Update description of GNSS-RealTimeIntegrity IE and Stage 2 to clarly state what condition can be interpreted as DNU = FALSE.

Note: Annex A contain a modified version of the GNSS-RealTimeIntegrity IE which highlights the list of satellites monitored for integrity. This can be used as input for Stage 3 CR and subject to offline review.

Proposal 3. For the purpose of GNSS integrity feature added in Release17, an additional DNU flag per constellation is not needed.

Open Issue #2:

Proposal 4. For Release 17, the bounding of GNSS errors is based on paired overbounding principle characterized by mean and standard deviation. In future releases provision of full covariance matrix for the orbital covariance can be revisited.

Proposal 6. Agree to include integrity bounds for Clock in the GNSS-SSR-ClockCorrections IE and bounds for Orbit in the existing GNSS-SSR-OrbitCorrections IEs rather than combining them in a new joint IE.

Open Issue #3:

Proposal 7. If possible, reuse existing IEs the following Integrity Residual Risk parameters: Probability of Onset of Constellation Fault, Mean Constellation Fault Duration, Proability of Onset of Satellite Fault, and Mean Satellite Fault Duration.

Note: candidate IEs in order of preference: GNSS-SSR-OrbitCorrections, GNSS-RealTimeIntegrity IE. This can be dealth offline as part of update to stage 3 CR – input from Rapporteur.

Proposal 8. Probability of Onset of Ionosphere Fault and Mean Ionosphere Fault Duration parameters are included in the GNSS-SSR-STEC-Correction. Probability of Onset of Troposphere Fault and Mean Troposphere Fault Duration parameters are included in the GNSS-SSR-GriddedCorrection.

Open Issue #5:

Proposal 10. Agree to enable periodic transmission of assistance data for GNSS integrity.

Proposal 11. Add gnss-Integrity-PeriodicServiceAlert-r17 to the list of periodic GNSS assistance data. FFS if other IEs need to be added (input from Stage 3 rapporteur).

Open Issue #6:

Proposal 13: Adopt the mapping of GNSS Integrity IEs to posSIB as propoed in the table from below:

GNSS Common Assistance Data (clause 6.5.2.2)

posSibType assistanceDataElement

posSibType1-9 GNSS-Integrity-ServiceParameters

posSibType1-10 GNSS-Integrity-ServiceAlert

Open Issue #7, #8 (R2-D1):

Proposal 14. Add TIR and AL to the IntegrityInformationRequest-r17 IE. TTA is FFS. Their value ranges shall be based on table 9.2.4 in TR 38.857.

Open Issue #9 (R2-D2):

Proposal 17. Add HPL and VPL to the IntegrityInfo IE. The value range of these two parameters covers 0 – 500m interval. Resolution is 1cm.

Note: HPL representation e.g., 2D ellipse or Alon-Cross track pair is based on input from Stage 3 rapporteur.

Proposal 18. Add HAL and VAL to the IntegrityInfo IE. The value range of these two parameters covers 0 – 500m interval. Resolution is 1cm.

Note: HAL representation e.g. cicular, 2D ellipse is based on input from Stage 3 rapporteur.

Open Issue #10 (R2-D4):

Proposal 21. Adopt the proposed encoding for GNSS-Integrity-ServiceParameter in Stage 3.

Proposal 22. Adopt the following description for the GNSS-Integrity-ServiceAlert in Stage 3. Service DNU is FFS.

GNSS-Integrity-ServiceAlert field descriptions

ionosphereDoNotUse

This field indicates whether the ionospheric corrections in IEs GNSS-SSR-STEC-Correction IE can be used for integrity related applications (FALSE) or not (TRUE).

troposphereDoNotUse

This field indicates whether the tropospheric corrections in IEs GNSS-SSR-GriddedCorrection IE can be used for integrity related applications (FALSE) or not (TRUE).

Open Issue #11 (R2-D5):

Proposal 23. Adopt the proposed encoding of the SSR-IntegrityCodeBiasBounds.

Open Issue #12 (R2-D6):

Proposal 24. Adopt the proposed encoding of the SSR-IntegrityPhaseBiasBounds.

Open Issue #13 (R2-D7):

Proposal 25. Adopt the proposed encoding for the STEC-IntegrityParameters-r17 and STEC-IntegrityErrorBounds-r17.

Open Issue #14 (R2-D8):

Proposal 26. Adopt the proposed encoding for the SSR-GriddedCorrectionIntegrityParameters-r17 and TropoDelayIntegrityErrorBounds-r17.

Discussion:

Huawei are OK with this set of proposals, but for the RealTimeIntegrity IE, they found the TP indicates the mandatory IE can be left empty, which does not work from an ASN.1 perspective. This can be discussed further in the running CR.

ESA indicate the TP was informative and the signalling details can be further worked on.

Agreements:

Proposal 1. For the purpose of GNSS integrity feature added in Release17, use GNSS-RealTimeIntegrity IE to signal to UE bad satellites (and GNSS constellations).

Proposal 2. Update description of GNSS-RealTimeIntegrity IE and Stage 2 to clarly state what condition can be interpreted as DNU = FALSE.

Note: Annex A contain a modified version of the GNSS-RealTimeIntegrity IE which highlights the list of satellites monitored for integrity. This can be used as input for Stage 3 CR and subject to offline review.

Proposal 3. For the purpose of GNSS integrity feature added in Release17, an additional DNU flag per constellation is not needed.

Open Issue #2:

Proposal 4. For Release 17, the bounding of GNSS errors is based on paired overbounding principle characterized by mean and standard deviation. In future releases provision of full covariance matrix for the orbital covariance can be revisited.

Proposal 6. Agree to include integrity bounds for Clock in the GNSS-SSR-ClockCorrections IE and bounds for Orbit in the existing GNSS-SSR-OrbitCorrections IEs rather than combining them in a new joint IE.

Open Issue #3:

Proposal 7. If possible, reuse existing IEs the following Integrity Residual Risk parameters: Probability of Onset of Constellation Fault, Mean Constellation Fault Duration, Proability of Onset of Satellite Fault, and Mean Satellite Fault Duration.

Note: candidate IEs in order of preference: GNSS-SSR-OrbitCorrections, GNSS-RealTimeIntegrity IE. This can be dealth offline as part of update to stage 3 CR – input from Rapporteur.

Proposal 8. Probability of Onset of Ionosphere Fault and Mean Ionosphere Fault Duration parameters are included in the GNSS-SSR-STEC-Correction. Probability of Onset of Troposphere Fault and Mean Troposphere Fault Duration parameters are included in the GNSS-SSR-GriddedCorrection.

Open Issue #5:

Proposal 10. Agree to enable periodic transmission of assistance data for GNSS integrity.

Proposal 11. Add gnss-Integrity-PeriodicServiceAlert-r17 to the list of periodic GNSS assistance data. FFS if other IEs need to be added (input from Stage 3 rapporteur).

Open Issue #6:

Proposal 13: Adopt the mapping of GNSS Integrity IEs to posSIB as propoed in the table from below:

GNSS Common Assistance Data (clause 6.5.2.2)

posSibType assistanceDataElement

posSibType1-9 GNSS-Integrity-ServiceParameters

posSibType1-10 GNSS-Integrity-ServiceAlert

Open Issue #7, #8 (R2-D1):

Proposal 14. Add TIR and AL to the IntegrityInformationRequest-r17 IE. TTA is FFS. Their value ranges shall be based on table 9.2.4 in TR 38.857.

Open Issue #9 (R2-D2):

Proposal 17. Add HPL and VPL to the IntegrityInfo IE. The value range of these two parameters covers 0 – 500m interval. Resolution is 1cm.

Note: HPL representation e.g., 2D ellipse or Alon-Cross track pair is based on input from Stage 3 rapporteur.

Open Issue #10 (R2-D4):

Proposal 21. Adopt the proposed encoding for GNSS-Integrity-ServiceParameter in Stage 3.

Proposal 22. Adopt the following description for the GNSS-Integrity-ServiceAlert in Stage 3. Service DNU is FFS.

GNSS-Integrity-ServiceAlert field descriptions

ionosphereDoNotUse

This field indicates whether the ionospheric corrections in IEs GNSS-SSR-STEC-Correction IE can be used for integrity related applications (FALSE) or not (TRUE).

troposphereDoNotUse

This field indicates whether the tropospheric corrections in IEs GNSS-SSR-GriddedCorrection IE can be used for integrity related applications (FALSE) or not (TRUE).

Open Issue #11 (R2-D5):

Proposal 23. Adopt the proposed encoding of the SSR-IntegrityCodeBiasBounds.

Open Issue #12 (R2-D6):

Proposal 24. Adopt the proposed encoding of the SSR-IntegrityPhaseBiasBounds.

Open Issue #13 (R2-D7):

Proposal 25. Adopt the proposed encoding for the STEC-IntegrityParameters-r17 and STEC-IntegrityErrorBounds-r17.

Open Issue #14 (R2-D8):

Proposal 26. Adopt the proposed encoding for the SSR-GriddedCorrectionIntegrityParameters-r17 and TropoDelayIntegrityErrorBounds-r17.

Potentially Agreeable

Open Issue #2:

Proposal 5. For Release 17, besides the 3 required variance parameters for Orbit, the covariance parameters, in along-track/cross-track/radial frame, can be provided optionally.

Open Issue #4:

Proposal 9. Agree not to include additional validaity time parameters together with the bounds parameters.

Open Issue #7, #8 (R2-D1):

Proposal 15. Indicate wehter Reporting Mode 1 or Reporting Mode 2.

Open Issue #9 (R2-D2):

Proposal 19. Add TIR, AL, and TTA to the IntegrityInfo IE.

Proposal 20. Support Reporting Mode 2.

Others & Non-critical items for Rel-17

Proposal 12: Add information about the local environement of the UE.

Proposal 16. A-GNSS RequestLocationInformation includes additional requests about the local environment of the UE: number of detected/used satellites, ambiguity fix status category, CN0, multipath.

[R2-2203593](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2203593%20%5bAT117-e%5d%5b623%5d%5bPOS%5d%20Summary%20-%20Open%20issues%20GNSS%20integrity%20(ESA).docx) [AT117-e][623][POS] Early discussion of integrity issues (ESA) ESA discussion Rel-17 NR\_pos\_enh-Core

Open item #2: (remaining elements) of Cross-Covariance terms

Proposal 1. Covariance parameters for Orbital errors are not included in Rel17. These terms, together with the full cross-covariance matrix, can be revisted in future releases and possibly coordinated with RTCM.

Discussion:

Ericsson think there are technical arguments that the covariance terms are not strongly beneficial in some situations, but these situations are not necessarily typical. They think there could be deployments with reference stations closer together where the errors are an issue. They suggest it could be an optional addition handled with a capability, but they are not sure it is purely an optimization.

ESA indicate that we had several correction data providers participating in the discussion, most of whom felt that this implementation is not widely used. They agree that this should be more thoroughly investigated, but we need to take a decision now.,

Swift think even the providers who indicated it is not widely used were OK to include the parameters optionally. They understand that these parameters are included in SBAS, and here we have more demanding requirements and it makes sense to include these parameters. They can accept that we address it in a future release.

Ericsson wonder if we will compile a list of candidate topics for future releases. Intel indicate that we will not make recommendations for a future release, which is a RP discussion, but we have a general need to coordinate with RTCM and make corresponding updates.

Agreement:

Proposal 1. Covariance parameters for Orbital errors are not included in Rel17. These terms, together with the full cross-covariance matrix, can be revisted in future releases and possibly coordinated with RTCM.

Proposal 2. The validity time of the integrity bounds is set as equal to the validity time of the SSR data. No additional validity time parameter is defined in Rel17.

Discussion:

Swift can accept the proposal, but wonder whether the validity time would then be captured in stage 2. They are not sure if the validity period of the SSR data is defined in stage 2 now.

Qualcomm indicate there is the expiration time in the posSIB, and the validity time for point-to-point is the provision interval. They do not think there are non-periodic use cases for SSR, but if so, the validity time would be the response time.

Ericsson wonder if this means that the UE can assume the validity of the data persists until new data are available. Swift understand it is until the end of the nominal interval. Qualcomm have the same understanding.

Agreement:

Proposal 2. The validity time of the integrity bounds is set as equal to the validity time of the SSR data. No additional validity time parameter is defined in Rel17.

Open Item #7, #8 (R2-D1):

Proposal 3. Release 17 supports only Reporting Mode 1 (PL reporting). Reporting Mode 2 can be revisited in future releases.

Proposal 4. For reporting Mode 1, TTA is not needed.

Open Item #9 (R2-D2):

Proposal 5. Provide TIR as optional parameter in the Integrity Information Result

Discussion:

Nokia wonder what TIR really means in this context. They understand that it is a KPI provided to the UE by the LMF already, and here it seems to mean more of an “achievable TIR”, so we may need to clarify the wording.

ESA clarify that it is an “achievable” TIR, and there can be situations where it is not the same as the value requested by the LMF.

ESA think P18 from the preceding document may no longer be applicable in this light. Qualcomm think if TTA is not needed, AL is not needed either. Swift think the AL is still needed because the PL needs to be compared to the AL. Qualcomm think the LMF can do this comparison and the UE does not need to do it.

Agreements:

Proposal 3. Release 17 supports only Reporting Mode 1 (PL reporting). Reporting Mode 2 can be revisited in future releases.

Proposal 4. For reporting Mode 1, TTA is not needed.

Proposal 5 (modified). Provide achievable TIR as optional parameter in the Integrity Information Result

Other documents

[R2-2203034](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2203034_UE_Integrity_Fraunhofer_Ericsson_ESA.docx) UE-aided detection of threat to GNSS systems and assistance data signaling Fraunhofer IIS; Fraunhofer HHI; Ericsson; ESA discussion R2-2200955

[R2-2203090](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2203090%20Discussion%20on%20GNSS%20positioning%20integrity.docx) Discussion on GNSS positioning integrity vivo discussion Rel-17 NR\_pos\_enh-Core

[R2-2203199](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2203199%20-%20Reporting%20of%20GNSS%20Positioning%20Integrity%20Result.docx) Reporting of GNSS Positioning Integrity Result Nokia, Nokia Shanghai Bell discussion Rel-17 FS\_NR\_pos\_enh

[R2-2203359](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2203359%20GNSS%20integrity%20open%20issues.docx) On remaining GNSS Integrity open issues Ericsson discussion Rel-17

#### 8.11.2.5 A-GNSS enhancements

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

Running CRs

[R2-2202402](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\37.355_CR0327_(Rel-17)_R2-2202402.docx) Introduction of B2a and B3I signal in BDS system in A-GNSS CATT, CAICT, CMCC, China Telecom, China Unicom, Huawei, HiSilicon, Intel Corporation, ZTE Corporation, CBN, vivo, OPPO, Lenovo, MediaTek Inc, Spreadtrum Communications, Xiaomi. CR Rel-17 37.355 16.7.0 0327 - B NR\_pos\_enh-Core R2-2200298

* Revised in R2-2203609

[R2-2203609](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\37.355_CR0327r1_(Rel-17)_R2-2203609.docx) Introduction of B2a and B3I signal in BDS system in A-GNSS CATT, CAICT, CMCC, China Telecom, China Unicom, Huawei, HiSilicon, Intel Corporation, ZTE Corporation, CBN, vivo, OPPO, Lenovo, MediaTek Inc, Spreadtrum Communications, Xiaomi. CR Rel-17 37.355 16.7.0 0327 1 B NR\_pos\_enh-Core R2-2200298

* Endorsed

[R2-2202403](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\36.305_CR0106_(Rel-17)_R2-2202403.docx) Introduction of B2a and B3I signal in BDS system in A-GNSS CATT, CAICT, CMCC, China Telecom, China Unicom, Huawei, HiSilicon, Intel Corporation, ZTE Corporation, CBN, vivo, OPPO, Lenovo, MediaTek Inc, Spreadtrum Communications, Xiaomi. CR Rel-17 36.305 16.4.0 0106 - B NR\_pos\_enh-Core R2-2109485

* Revised in R2-2203610

[R2-2203610](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\36.305_CR0106r1_(Rel-17)_R2-2203610.docx) Introduction of B2a and B3I signal in BDS system in A-GNSS CATT, CAICT, CMCC, China Telecom, China Unicom, Huawei, HiSilicon, Intel Corporation, ZTE Corporation, CBN, vivo, OPPO, Lenovo, MediaTek Inc, Spreadtrum Communications, Xiaomi. CR Rel-17 36.305 16.4.0

0106 1 B NR\_pos\_enh-Core R2-2109485

* Endorsed

[R2-2202404](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\38.305_CR0084_(Rel-17)_R2-2202404%7f.docx) Introduction of B2a and B3I signal in BDS system in A-GNSS CATT, CAICT, CMCC, China Telecom, China Unicom, Huawei, HiSilicon, Intel Corporation, ZTE Corporation, CBN, vivo, OPPO, Lenovo, MediaTek Inc, Spreadtrum Communications, Xiaomi. CR Rel-17 38.305 16.7.0 0084 - B NR\_pos\_enh-Core R2-2109485

* Revised in R2-2203611

[R2-2203611](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\38.305_CR0084r1_(Rel-17)_R2-2203611.docx) Introduction of B2a and B3I signal in BDS system in A-GNSS CATT, CAICT, CMCC, China Telecom, China Unicom, Huawei, HiSilicon, Intel Corporation, ZTE Corporation, CBN, vivo, OPPO, Lenovo, MediaTek Inc, Spreadtrum Communications, Xiaomi. CR Rel-17 38.305 16.7.0 0084 1 B NR\_pos\_enh-Core R2-2109485

* Endorsed

[R2-2203612](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2203612%20Report%20of%20%5bAT117e%5d%5b601%5d%5bPOS%5d%20BDS%20running%20CRs%20(CATT).docx) Report of [AT117-e][601][POS] BDS running CRs (CATT) CATT discussion Late

* Noted
* [AT117-e][601][POS] BDS running CRs (CATT)

Scope: Review the following CRs, collect comments, and update if necessary:

* R2-2202402 (BDS introduction to 37.355)
* R2-2202403 (BDS introduction to 36.305)
* R2-2202404 (BDS introduction to 38.305)

Intended outcome: Endorsable CRs and report in R2-2203612

Deadline: Friday 2022-02-25 1000 UTC

[R2-2202607](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2202607%20Draft%20running%20CR%20for%20stage2%20spec%20for%20NAVIC%20in%20R17%20positioning.docx) Draft running CR for stage2 spec for NAVIC in R17 positioning Huawei, HiSilicon draftCR Rel-17 38.305 16.7.0 B NR\_pos\_enh-Core

* Revised in R2-2203615

[R2-2203615](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2203615%20Draft%20running%20CR%20for%20stage2%20spec%20for%20NAVIC%20in%20R17%20positioning.docx) Draft running CR for stage2 spec for NAVIC in R17 positioning Huawei, HiSilicon draftCR Rel-17 38.305 16.7.0 B NR\_pos\_enh-Core

* Endorsed

[R2-2203710](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2203710%20NaVIC.docx) Introduction of NavIC for broadcast support Ericsson draftCR Rel-17 38.331 16.7.0 B NR\_pos\_enh-Core

* Endorsed
* [AT117-e][602][POS] NavIC running CRs (Ericsson/Huawei)

Scope: Review the following CRs, collect comments, and update if necessary:

* R2-2202607 (NavIC introduction to 38.305)
* R2-2203710 (NavIC introduction to 38.331)

Intended outcome: Endorsable CRs and report in R2-2203608

Deadline: Friday 2022-02-25 1000 UTC

[R2-2203608](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2203608.docx) [AT117-e][602][POS] NavIC running CRs (Ericsson/Huawei) Ericsson discussion Rel-17

* Noted

#### 8.11.2.6 Accuracy enhancements

Input on the accuracy enhancement objectives led by RAN1.

Including report of [Pre117-e][611][POS] Open issues on positioning accuracy enhancements (CATT)

Email report

[R2-2202410](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2202410%20Report%20of%20%5bPre117-e%5d%5b611%5d%5bPOS%5d%20Open%20issues%20on%20positioning%20accuracy%20enhancements%20(CATT).docx) Report of [Pre117-e][611][POS] Open issues on positioning accuracy enhancements (CATT) CATT discussion Late

Potentially easy to agree (clear majority):

UE Tx TEG association

Proposal 1: RAN2 to agree the SRS-TEG association reporting, if any, shall always be reported along with the UE Rx – Tx time difference measurement report for Multi-RTT without no additional periodicities (8/11) and to agree the TP on report of association for Multi-RTT in the annex (11/12). FFS if CarrierPointA is required in the association, FFS the associated resourcesetIDgroup.

Proposal 2: RAN2 to agree to configure UE TxTEG Report Config in SRS-Config IE and a new RRC message to report the changes of UE TxTEG (9/11).

Proposal 5: RAN2 to agree each of association information of UL SRS resources with timestamp indicating the change of the Tx TEG association (8/12) and agree the TP of UE-TxTEG-Report-v17xy-IEs via RRC in the annex.

Discussion:

vivo think there is a typo in P1: “without no” should be “with no”.

Qualcomm think the FFS points in P1 are not aligned with the RAN1 spreadsheet that was implemented in the running CR. CATT clarify that some companies commented that these parameters were needed, but there was no additional feedback.

Nokia think P5 is not really essential given that RAN1 agreed only periodic reporting, and in general we should clarify which positioning methods are impacted; they think P1 applies to multi-RTT and UL-TDOA while P2 is for UL-TDOA.

CATT think P5 is for UL-TDOA, and P1 is for multi-RTT (but not UL-TDOA). On P2, they agree that it is specific to UL-TDOA. They also note that the current RRC running CR is not aligned with P2.

Agreements:

Proposal 1 (modified): The SRS-TEG association reporting, if any, shall always be reported along with the UE Rx – Tx time difference measurement report for Multi-RTT with no additional periodicities (8/11) and to agree the TP on report of association for Multi-RTT in the annex (11/12). Any additional parameters can be discussed in the running CRs pending RAN1 input.

Proposal 2 (modified): For UL-TDOA, configure UE TxTEG Report Config in SRS-Config IE and a new RRC message to report the changes of UE TxTEG (9/11).

Proposal 5 (modified): Each of association information of UL SRS resources with timestamp indicating the change of the Tx TEG association (8/12) and agree the TP of UE-TxTEG-Report-v17xy-IEs via RRC in the annex.

Broadcast of TRP Tx TEG info and Measurement report

Proposal 6: RAN2 to agree new posSibType6-5 NR-DL-PRS-TRP-TEG-Info for the TRP Tx TEG info (10/11) and the TP of NR-DL-PRS-TRP-TEG-Info for broadcast(8/11) in the annex, FFS the description on resource association.

Proposal 8: RAN2 to agree the stage-3 design of RSTD measurements from different DL PRS resources per UE Rx TEG report in the annex (10/12).

Proposal 9: RAN2 to agree the updated stage-3 design of UE Rx-Tx time difference measurements obtained from different DL PRS resources per UE Rx TEG/ RxTx TEG in the annex (9/9), FFS the nr-UE-Tx-TEG-ID-r17 in case2 and case3.

Discussion:

Qualcomm ask on P9 if it is agreed that case 4 is removed. CATT think it should be removed because RAN1 deleted the FFS part in their parameters already. For the UE Tx TEG ID in case 2 and case 3, this is still FFS, but they understand the LMF needs the nr-UE-Tx-TEG-ID in cases 2 and 3.

Nokia understand on P9, there was a RAN1 agreement that the nr-UE-Tx-TEG-ID is optional.

Qualcomm think it depends on how we decide to implement; at the moment they have a CHOICE with the different pairs of parameters available from the RAN1 decision, and the alternative would be a SEQUENCE of optional items. They think the CHOICE structure addresses Nokia’s comment. On the Tx TEG, Qualcomm are not sure if it should be included finally, but it is in the beginning of the message (independent of the TRP measurement) and it would be sufficient to have an index to it in the measurement. Qualcomm think the FFS in P9 will be clarified from RAN1.

Agreements:

Proposal 6: RAN2 to agree new posSibType6-5 NR-DL-PRS-TRP-TEG-Info for the TRP Tx TEG info (10/11) and the TP of NR-DL-PRS-TRP-TEG-Info for broadcast(8/11) in the annex, FFS the description on resource association.

Proposal 8: RAN2 to agree the stage-3 design of RSTD measurements from different DL PRS resources per UE Rx TEG report in the annex (10/12).

Proposal 9 (modified): RAN2 to agree the updated stage-3 design of UE Rx-Tx time difference measurements obtained from different DL PRS resources per UE Rx TEG/ RxTx TEG in the annex (9/9), FFS the nr-UE-Tx-TEG-ID-r17 in case2 and case3 (pending RAN1).

DL-AoD enhancement

Proposal 14: RAN2 to agree the following option is taken on supporting LMF to provide the TRP beam/antenna information to UE: Option a: New IE to carry the TRP beam/antenna information, e.g., NR-TRP-BeamAntennaInfo in running CR of TS37.355. (8/12)

Proposal 16: As for the TRP beam/antenna information provided by the LMF to the UE for UE-based DL-AoD, RAN2 to agree that the peak power value that is used as the reference for other resource powers on a specific angle is not provided (12/12).

Proposal 17: RAN2 to agree that the value ranges of the relative power of DL-PRS resource should be decided by RAN1 (11/12).

Proposal 18: RAN2 to agree that keep RSRP still as mandatory within the measurement results info provided by UE to LMF for DL-AOD in R17 (10/12) ), and it may be revised if there is clear agreement from RAN1..

Proposal 19: RAN2 to agree that the value ranges of the RSRPP should be decided by RAN1 (11/12).

Proposal 20: RAN2 to agree that the angle assistance information (expected angel value and uncertainty) should be per TRP (12/12).

Proposal 21: RAN2 to agree to extend the R16 IE NR-DL-PRS-AssistanceDataPerTRP-r16 to carry the expected angle assistance information (like expected RSTD and expected RSTD uncertainty)(7/12), FFS with restrictions only applied for DL-AOD positioning method waiting for RAN1 feedback.

Proposal 22: RAN2 to agree that the value ranges of the expected angle assistance (expected angel value and uncertainty) relative power of DL-PRS resource should be decided by RAN1 (8/11).

Proposal 23: RAN2 to agree to extend the R16 IE NR-DL-PRS-Resource-r16 to carry the R17 DL-PRS resource priority list information, with restrictions that it is only applied for DL-AOD positioning method (8/12).

Proposal 24: RAN2 to agree that it is up to RAN1 to decide whether further description of UE behaviour needed related to the measurements and/or reporting is needed related to the prioritization of DL-AOD reporting.

Discussion:

Nokia understand P16 also applies to UE-assisted DL-AoD. CATT think this is not right according to RAN1’s parameter table; the BeamAntennaInfo is specific to UE-based, because the UE needs it to compute the position.

Qualcomm agree that the RAN1 spreadsheet only indicates UE-based, but they think we don’t need to distinguish which AD are for which mode and method; for this reason they have a generic bitmap in the running CR. On P21 and P23, they can accept majority view, but want to raise the point that if we include the expected angles and the resource priority list, it works but we have to keep in mind that the DL-PRS AD can be broadcasted, and we do not know which method the UE will use it for—thus we should not say that it is restricted to DL-AoD. They also understand RAN1 indicated that the UE can request this AD, and the UE may need the expected angle. The consequence is that whenever the UE requests the expected angle it would get the DL-PRS information, and Qualcomm would prefer to keep them separate.

vivo think in P23, “priority list” should be “subset information” to align with RAN1.

Huawei understand Qualcomm’s point, but think this is not creating a new precedent in the LPP spec; PRS is similar, where the AD are common but the use can be per positioning method.

Nokia agree with Qualcomm on P21 and would prefer to keep the angle assistance separate from the PRS assistance data, but they can accept the majority view.

Agreements:

Proposal 14: RAN2 to agree the following option is taken on supporting LMF to provide the TRP beam/antenna information to UE: Option a: New IE to carry the TRP beam/antenna information, e.g., NR-TRP-BeamAntennaInfo in running CR of TS37.355. (8/12)

Proposal 16: As for the TRP beam/antenna information provided by the LMF to the UE for UE-based DL-AoD, RAN2 to agree that the peak power value that is used as the reference for other resource powers on a specific angle is not provided (12/12).

Proposal 17: RAN2 to agree that the value ranges of the relative power of DL-PRS resource should be decided by RAN1 (11/12).

Proposal 18: RAN2 to agree that keep RSRP still as mandatory within the measurement results info provided by UE to LMF for DL-AOD in R17 (10/12) ), and it may be revised if there is clear agreement from RAN1.

Proposal 19: RAN2 to agree that the value ranges of the RSRPP should be decided by RAN1 (11/12).

Proposal 20: RAN2 to agree that the angle assistance information (expected angel value and uncertainty) should be per TRP (12/12).

Proposal 21: RAN2 to agree to extend the R16 IE NR-DL-PRS-AssistanceDataPerTRP-r16 to carry the expected angle assistance information (like expected RSTD and expected RSTD uncertainty)(7/12), FFS with restrictions only applied for DL-AOD positioning method waiting for RAN1 feedback.

Proposal 22: RAN2 to agree that the value ranges of the expected angle assistance (expected angel value and uncertainty) relative power of DL-PRS resource should be decided by RAN1 (8/11).

Proposal 23 (modified): RAN2 to agree to extend the R16 IE NR-DL-PRS-Resource-r16 to carry the R17 DL-PRS resource subset information, with restrictions that it is only applied for DL-AOD positioning method (8/12).

Proposal 24: RAN2 to agree that it is up to RAN1 to decide whether further description of UE behaviour needed related to the measurements and/or reporting is needed related to the prioritization of DL-AOD reporting.

LOS/NLOS indicator

Proposal 25: RAN2 to agree the LOS/NLOS indicator associated with UE measurement report and associated TRP and resource id (if there is) in each measurement report (10/12). FFS the associated resource id in additional path case.

Discussion:

CATT indicate that the FFS part on the additional path case is a situation where the RAN1 parameter list is not clear, but they think RAN2 can discuss it directly. In their understanding the additional path does not include resource ID.

Lenovo understand that RAN1#107-e decided not to pursue additional path case for the LoS/NLoS indicator. Qualcomm have the same understanding. We can add it if RAN1 add it.

Ericsson think there is no decision from RAN1 that the case does not exist, explicitly, and the agreement could be read in different ways. Qualcomm think we can wait for an update from RAN1.

Nokia think we should be clear about the applicable positioning methods; they think it is for all RAT-dependent methods.

Intel think we could apply it to all RAT-dependent methods, but think for E-CID there may be a problem. Huawei and Nokia also think we could exclude E-CID.

Agreement:

The LOS/NLOS indicator is associated with UE measurement report and associated TRP and resource id (if there is) in each measurement report, for all RAT-dependent methods except E-CID.

Need further discussion:

UE Tx TEG association for UL-TDOA via RRC

Proposal 3: RAN2 to further discuss the configurable intervals on report of association of TxTEG via RRC is ms120, ms240, ms480, ms640, ms1024, ms2048, ms5120, ms10240 (7/12).

Proposal 4: RAN2 to further discuss the reportingAmount as 1 for single request/response, and other value of reportingAmount-r17: r2, r4, r8, r16, r32, r64, infinity (6/12).

Discussion:

Huawei understand on P3 that there is no big need to align with the SRS periodicity; for each instance of TEG reports, it can include multiple associations with different timestamps. On P4, they think infinity applies when TEG reporting is under control of RRC (i.e. “until RRC deconfigures reporting”).

Nokia think on P4 the amount 1 is not needed, since the RAN1 agreement is only for periodic reporting.

Qualcomm think on the SRS alignment, a UE can only report new Tx TEGs after it has transmitted SRS, but they do not think the interval needs to be exactly aligned with the SRS periodicities; it should have some sensible relation, e.g. multiples of what is possible for the SRS. The problem is if a report interval comes in the middle of an SRS transmission. On P4, they think one-shot reporting is the normal case.

Huawei indicate RAN1 agreed single request/response is supported.

Ericsson think the periodicity values in the proposal are not random; they are intended to be aligned with gNB measurement intervals as configured by the LMF. They agree with Qualcomm that it should have a sensible relation to the SRS period, but the SRS period can be very short. On P4, they think we only need one-shot reporting and are not sure what infinity would mean, but they can accept Huawei’s interpretation.

CATT think both interval and amount are required, and they think only 1 and infinity are needed for the amounts. They agree that the intervals should be sensible in relation to the SRS period.

Agreements:

Proposal 3 (modified): The configurable intervals on report of association of TxTEG via RRC are ms120, ms240, ms480, ms640, ms1024, ms2048, ms5120, ms10240. Relation to SRS intervals can be further checked in running CR discussion.

reportingAmount can be 1 or infinity.

Support of measurements

Proposal 7: RAN2 to further discuss if restrict the PRS number per target TRP in a UE measurement report (5/9).

Discussion:

CATT indicate only five companies wanted the restriction.

Qualcomm think we don’t need to capture the restriction because it is in RAN1 specs how many measurements can be reported per TRP.

* [AT117-e][618][POS] Beam and antenna information for DL-AoD accuracy enhancements (CATT)

Scope: Treat P10/P11/P12/P13/P15 of R2-2202410 and attempt to converge.

Intended outcome: Report to Monday online session in R2-2203621

Deadline: Friday 2022-02-25 1000 UTC

[R2-2203621](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2203621%20Report%20of%20%5bAT117-e%5d%5b618%5d%5bPOS%5d%20Beam%20and%20antenna%20information%20(CATT).docx) Report of [AT117-e][618][POS] Beam and antenna information for DL-AoD accuracy enhancements (CATT) CATT discussion

Easy to agree (clear majority):

Proposal 1: RAN2 to agree that the beam/antenna information request only applies to the UE-based DL-AOD positioning method (11/11).

Proposal 2: RAN2 to agree that the following assistance data need to be requested by UE for UE-based DL-AoD:

‑ losNlosInfo (10/11);

‑ beam/antenna information (11/11);

Proposal 3: RAN2 to agree that the following assistance data need to be requested by UE for UE-based DL-TDOA:

‑ losNlosInfo (9/11);

‑ trpTEG-Info (10/11);

Proposal 5: RAN2 to agree that both the azimuth and elevation can be optional, but at least one should be provided within the beam/antenna information (10/11).

Discussion:

Qualcomm think the UE does not “need to” request AD; these proposals should say “may be requested”.

Agreements:

Proposal 1: RAN2 to agree that the beam/antenna information request only applies to the UE-based DL-AOD positioning method (11/11).

Proposal 2 (modified): The following assistance data may be requested by UE for UE-based DL-AoD:

‑ losNlosInfo (10/11);

‑ beam/antenna information (11/11);

Proposal 3 (modified): The following assistance data may be requested by UE for UE-based DL-TDOA:

‑ losNlosInfo (9/11);

‑ trpTEG-Info (10/11);

Proposal 5: RAN2 to agree that both the azimuth and elevation can be optional, but at least one should be provided within the beam/antenna information (10/11).

Potentially to agree:

Proposal 4: RAN2 to agree to introduce positioning specific IE nr-PosCalcAssistanceRequest-r17 for UE-based DL-AoD and DL-TDOA separately, based on the assistance information need to be requested by UE as in P2 and P3 (7/11).

Proposal 6: RAN2 to agree the TP of option1 (change the azimuth-r17 and elevation-r17 both to be optional, but add a restriction in the field description that at least azimuth or elevation should be present) (7/11).

Discussion:

Qualcomm indicate these proposals are not in the running CR now; there is a bitmap of assistance data, and these proposals would constrain the use of certain bits for certain methods.

Intel think the running CR way and P4 can both work, but they think P4 is clear because there are AD fields that are not applicable to both methods.

Huawei think P4 is a Rel-16 issue with the PRS AD request structure, and we don’t need to change it now. Qualcomm confirm that the bitmap includes all AD including the Rel-16 fields; in Rel-16 we had only one bit for PosCalcAssistance, and now we add finer-grained AD.

Qualcomm think P4 would create a situation where requesting the Rel-17 AD brought all the Rel-16 AD along with it. They think P4 is the opposite of what we did with GNSS, where we left the selection of AD to implementation. Huawei are OK with this explanation.

Qualcomm clarify the bitmap is new in Rel-17, but includes the Rel-16 AD. In Rel-16 we had only one bit for all PosCalc AD.

Show of hands:

P4 approach: 1

Current running CR approach with bitmap: Possibly 4 (Tohru failure)

Agreements:

Keep the running CR approach for PosCalc AD; can be further discussed in running CR discussion if anything should change.

Proposal 6: RAN2 to agree the TP of option1 (change the azimuth-r17 and elevation-r17 both to be optional, but add a restriction in the field description that at least azimuth or elevation should be present) (7/11).

Need further discussion:

Proposal 7: RAN2 to discuss to send LS to RAN1 for confirming whether the beam/antenna information across different TRPs may be the same.

Discussion:

CATT indicate it was raised in the discussion that there could be signalling for this case, but we would need guidance from RAN1.

Ericsson think we discussed a similar idea in Rel-16 for beam information, and they think this was discussed and agreed in RAN1 this week. They do not think we need to ask RAN1. We can just reuse the associated TRP beam information.

Intel tend to agree with Ericsson that this is similar to what we have in Rel-16, and they think we can take it into account in the ASN.1 discussion.

Other documents

[R2-2202593](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2202593-UE-TX-TEG-RRC-v0.docx) On UE Tx TEG association for UL-TDOA via RRC Apple discussion

[R2-2202860](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2202860%20(R17%20NR%20POS%20WI%20AI81126_AccEnh).doc) Remaining Issues for Accuracy Enhancements InterDigital, Inc. discussion Rel-17 NR\_pos\_enh-Core

[R2-2203205](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2203205_Pos_TEG.docx) Considerations on Timing Error aspects Sony discussion Rel-17 NR\_pos\_enh-Core

[R2-2203361](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2203361%20LPP%20Accuracy%20enhancements%20and%20On-Demand%20PRS.docx) LPP Remaining Issues on Accuracy enhancements and On-Demand PRS Ericsson discussion Rel-17

[R2-2203462](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2203462%20TEG%20definitions.docx) Timing Error Group (TEG) definition Nokia, Nokia Shanghai Bell discussion Rel-17 NR\_pos\_enh-Core

#### 8.11.2.7 UE capabilities

Including report of [Pre117-e][612][POS] Open issues on positioning UE capabilities (Intel)

Email report

[R2-2202494](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2202494_Report%20of%20Pre117-612-v01_Rapp.docx) Report of [Pre117-e][612][POS] Open issues on positioning UE capabilities (Intel) Intel Corporation discussion Rel-17 NR\_pos\_enh-Core Late

Discussion:

Intel indicate RAN1 have provided an update of the feature list, and all our agreements will be accordingly updated.

Qualcomm wonder on P3.2.1-1 if it also includes E-CID. Intel indicate the intention was to include E-CID.

Agreements:

Granularity of response time:

Proposal point 3.2.1-1: [for agreements] [6/9] 10ms Finer granularity is only applied for NR RAT dependent positioning methods;

Capabilities for integrity:

Proposal point 3.2.2-1: [for agreements] [10/10] For GNSS integrity capability, adapt capabilities captured in the running LPP CR R2-2201723 as baseline;

TPs for individual capability items:

Proposal point 3.3.1-1: [for agreements] [8/8] 27-1 TEG is captured as

[TPs in R2-2202494]

Proposal point 3.3.2-1: [for agreements] 27-2, 27-13, 27-13a, 27-14, 27-14a are captured as

[TPs in R2-2202494]

Proposal point 3.3.3-1: [for agreements] 27-3/27-6 are captured as

[TPs in R2-2202494]

Proposal point 3.3.4-1: [for agreements] 27-4, 27-12 are captured as

[TPs in R2-2202494]

Proposal point 3.3.5-1: [for agreements] 27-7 are captured as

[TPs in R2-2202494]

Proposal point 3.3.7-1: [for agreements] 27-9 are captured as

[TP in R2-2202494]

Proposal point 3.3.8-1: [for agreements] 27-10, 27-10a, 27-11 are captured as

[TPs in R2-2202494]

Proposal point 3.3.9-1: [for agreements] 27-20, 27-21, 27-22are captured as

[TP in R2-2202494]

Proposal point 3.3.10-1: [for agreements] 27-15---27-19 are captured as

[TPs in R2-2202494]

Proposal point 3.4-1: [for agreements] 14-1 are captured as

[TPs in R2-2202494]

Running CRs

[R2-2202495](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2202495%20-%20Running%2038.331%20CR%20on%20positioning%20capbilities-v00.docx) Running 331 CR for Positioning UE capabilities Intel Corporation draftCR Rel-17 38.331 16.7.0 B NR\_pos\_enh-Core Late

* Revised in R2-2203624

[R2-2203624](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2203624-%20Running%2038.331%20CR%20on%20positioning%20capbilities-v02.docx) Running 331 CR for Positioning UE capabilities Intel Corporation draftCR Rel-17 38.331 16.7.0 B NR\_pos\_enh-Core

* Revised in R2-2203630

[R2-2203630](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2203630%20-%2038.331%20CR%20on%20positioning%20capbilities-v03.docx) 38.331 capability CR for the positioning enhancements WI Intel Corporation draftCR Rel-17 38.331 16.7.0 B NR\_pos\_enh-Core

* Endorsed for merge into the mega CR

[R2-2202496](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2202496%20-%20Running%2038.306%20CR%20on%20positioning%20capbilities-v00.docx) Running 306 CR for Positioning UE capabilities Intel Corporation draftCR Rel-17 38.306 16.7.0 B NR\_pos\_enh-Core Late

* Revised in R2-2203626

[R2-2203626](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2203626%20-%20Running%2038.306%20CR%20on%20positioning%20capbilities-v02.docx) Running 306 CR for Positioning UE capabilities Intel Corporation draftCR Rel-17 38.306 16.7.0 B NR\_pos\_enh-Core

* Revised in R2-2203941

[R2-2203941](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2203941%20-%2038.306%20CR%20on%20positioning%20capbilities-v03.docx) 38.306 capability CR for the positioning enhancements WI Intel Corporation draftCR Rel-17 38.306 16.7.0 B NR\_pos\_enh-Core

* Endorsed for merge into the mega CR
* [AT117-e][605][POS] Capability running CRs (Intel)

Scope: Review and update the following CRs:

* R2-2202495 (capability running CR to 38.331)
* R2-2202496 (capability running CR to 38.306)

Intended outcome: Endorsable CRs

Deadline: Friday 2022-02-25 1000 UTC – extended to Wednesday 2022-03-02 1000 UTC to take account of any additional RAN1 input

[R2-2203623](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2203623%20_Report%20of%20At117-605-v00.docx) Report of [AT117-e][605][POS] Capability running CRs (Intel) Intel Corporation discussion Rel-17 NR\_pos\_enh-Core

=> Noted

[R2-2204024](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2204024%20_Report%20of%20At117-605-v02_Rapp.docx) Report of [AT117-e][605][POS] Capability running CRs (Intel) Intel Corporation discussion Rel-17 NR\_pos\_enh-Core

=> Noted

### 8.11.3 Other

Any other topics on NR positioning enhancements.

# Annex: 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.

* [AT117-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 2022-03-03 1000 UTC

Positioning running CRs:

* [AT117-e][601][POS] BDS running CRs (CATT)

Scope: Review the following CRs, collect comments, and update if necessary:

* R2-2202402 (BDS introduction to 37.355)
* R2-2202403 (BDS introduction to 36.305)
* R2-2202404 (BDS introduction to 38.305)

Intended outcome: Endorsable CRs and report in R2-2203612

Deadline: Friday 2022-02-25 1000 UTC

* [AT117-e][602][POS] NavIC running CRs (Ericsson/Huawei)

Scope: Review the following CRs, collect comments, and update if necessary:

* R2-2202607 (NavIC introduction to 38.305)
* R2-2203710 (NavIC introduction to 38.331)

Intended outcome: Endorsable CRs and report in R2-2203608

Deadline: Friday 2022-02-25 1000 UTC

* [AT117-e][603][POS] Integrity stage 2 CRs (InterDigital)

Scope: Review and update the following CRs:

* R2-2202861 (integrity introduction to 36.305)
* R2-2202862 (integrity introduction to 38.305)

Intended outcome: Endorsable CRs

Deadline: Friday 2022-02-25 1000 UTC

* [AT117-e][604][POS] RAT-dependent positioning running CR to 38.305 (Intel)

Scope: Review and update the CR in R2-2202490.

Intended outcome: Endorsable CR in R2-2203605

Deadline: Friday 2022-02-25 1000 UTC

* [AT117-e][605][POS] Capability running CRs (Intel)

Scope: Review and update the following CRs:

* R2-2202495 (capability running CR to 38.331)
* R2-2202496 (capability running CR to 38.306)

Intended outcome: Endorsable CRs; extension: Endorsable CRs for merge into mega CRs

Deadline: Friday 2022-02-25 1000 UTC – extended to Wednesday 2022-03-02 1000 UTC to take account of any additional RAN1 input

* [AT117-e][606][POS] LPP running CR (Qualcomm)

Scope: Review and update the CR in R2-2203310.

Intended outcome: Endorsable CR in R2-2203619 and report in R2-2203620; extension: Agreeable CR

Deadline: Friday 2022-02-25 1000 UTC – extended to Wednesday 2022-03-02 1000 UTC

* [AT117-e][607][POS] Positioning running CR to 38.331 (Ericsson)

Scope: Review and update the CR in R2-2203364, including merge of the draft CRs in R2-2203362 and R2-2203445.

Intended outcome: Endorsable CR in R2-2203602; extension: Agreeable CR

Deadline: Friday 2022-02-25 1000 UTC – extended to Wednesday 2022-03-02 1000 UTC

* [AT117-e][608][POS] Positioning running CR to 38.321 (Huawei)

Scope: Review and update the CR in R2-2202605.

Intended outcome: Endorsable CR in R2-2203616; extension: Agreeable CR

Deadline: Friday 2022-02-25 1000 UTC – extended to Wednesday 2022-03-02 1000 UTC

* [AT117-e][609][POS] Positioning running CR to 36.331 (Huawei)

Scope: Review and update the CR in R2-2202606.

Intended outcome: Endorsable CR in R2-2203617

Deadline: Friday 2022-02-25 1000 UTC

Relay running CRs:

* [AT117-e][610][Relay] Relay running CR to 38.300 (MediaTek)

Scope: Review and update the CR in R2-2202343.

Intended outcome: Agreeable CR

Deadline: Tuesday 2022-03-01 1200 UTC

* [AT117-e][611][Relay] Relay running CR to 38.304 (Ericsson)

Scope: Review and update the CR in R2-2203324.

Intended outcome: Agreeable CR

Deadline: Tuesday 2022-03-01 1200 UTC

* [AT117-e][612][Relay] Relay running CR to 38.306 (Qualcomm)

Scope: Review and update the CR in R2-2203519.

Intended outcome: Agreeable CR

Deadline: Tuesday 2022-03-01 1200 UTC

* [AT117-e][613][Relay] Relay running CR to 38.321 (Apple)

Scope: Review and update the CR in R2-2202543.

Intended outcome: Agreeable CR

Deadline: Tuesday 2022-03-01 1200 UTC

* [AT117-e][614][Relay] Relay running CRs to 38.322/38.323 (Samsung)

Scope: Review and update the CRs in R2-2202950 and R2-2202951.

Intended outcome: Agreeable CR

Deadline: Tuesday 2022-03-01 1200 UTC

* [AT117-e][615][Relay] Relay running CR to 38.331 (Huawei)

Scope: Review and update the CR in R2-2202819.

Intended outcome: Agreeable CR

Deadline: Tuesday 2022-03-01 1200 UTC

* [AT117-e][616][Relay] Relay running CR to 38.351 (OPPO)

Scope: Review and update the CR in R2-2202276.

Intended outcome: Agreeable CR in R2-2203594

Deadline: Tuesday 2022-03-01 1200 UTC

Other discussions:

* [AT117-e][617][POS] LS to RAN1 on positioning issues needing further input (Intel)

Scope: Draft an LS to RAN1 based on the outcome of [Pre117-e][614], taking into account other issues identified in the pre-meeting discussions where guidance from RAN1 is needed.

Intended outcome: Approvable LS in R2-2203717

Deadline: Wednesday 2022-02-23 0200 UTC

* [AT117-e][618][POS] Beam and antenna information for DL-AoD accuracy enhancements (CATT)

Scope: Treat P10/P11/P12/P13/P15 of R2-2202410 and attempt to converge.

Intended outcome: Report to Monday online session in R2-2203621

Deadline: Friday 2022-02-25 1000 UTC

* [AT117-e][619][Relay] Flow control and pre-emptive BSR mechanisms (Samsung)

Scope: Discuss P1-P3 of R2-2202955 and determine if agreeable mechanisms can be developed. The features can be considered independently of each other.

Intended outcome: Endorsable TPs to affected specifications; report in R2-2203600

Deadline: Thursday 2022-02-24 1200 UTC

* [AT117-e][620][Relay] Reply LS to RAN3 on mapping configuration (Samsung)

Scope: Draft a reply to the LS in R2-2202136.

Intended outcome: Approved LS (preferably without CB) in R2-2203599 and report in R2-2203598

Deadline: Thursday 2022-02-24 1200 UTC

* [AT117-e][621][Relay] Additional issues on service continuity (OPPO)

Scope: Filter the issues raised in company tdocs under agenda item 8.7.2.2, determine if any critical issues need resolution, and attempt to converge on any critical issues.

Intended outcome: Report to Friday online session in R2-2203595

Deadline: Thursday 2022-02-24 1200 UTC

* [AT117-e][622][Relay] Remaining issues on discovery and (re)selection (ZTE)

Scope:

* Discuss the “for discussion” proposals from R2-2202378 and attempt to converge.
* Filter the issues raised in company tdocs under agenda item 8.7.2.5, determine if any critical issues need resolution, and attempt to converge on any critical issues.

Intended outcome: Report to Friday online session in R2-2203763

Deadline: Thursday 2022-02-24 1200 UTC

* [AT117-e][623][POS] Early discussion of integrity issues (ESA)

Scope: Discuss the need for signalling cross-covariance terms in the integrity assistance data, and identify if there are other critical issues that need treatment outside the running CR discussions.

Intended outcome: Report to Wednesday online session in R2-2203593

Deadline: Wednesday 2022-02-23 0200 UTC

* [AT117-e][624][POS] Agenda item 5.5 (Huawei)

Scope: Treat documents R2-2202597, R2-2202598, and R2-2202599 and conclude on the CRs.

Intended outcome: Agreed CRs (without CB)

Deadline: Wednesday 2022-03-02 1000 UTC

* [AT117-e][625][POS] Agenda item 6.3.2 (CATT)

Scope: Treat documents R2-2202407 and R2-2202596 and conclude on the CRs.

Intended outcome: Agreed CRs (without CB)

Deadline: Wednesday 2022-03-02 1000 UTC

* [AT117-e][626][POS] Agenda item 6.3.3 (Ericsson)

Scope: Treat documents R2-2202224, R2-2203275, R2-2203277, R2-2203531, and R2-2203368 and conclude on the CRs.

Intended outcome: Agreed CRs (without CB)

Deadline: Wednesday 2022-03-02 1000 UTC

* [AT117-e][627][Relay] Remaining issues on control plane (Huawei)

Scope:

* Discuss emergency case for relay UE setting cause value

Intended outcome: Report to CB session in R2-2203942

Deadline: Tuesday 2022-03-01 1200 UTC

* [AT117-e][628][POS] Remaining proposals from latency reduction summary (Apple)

Scope: Filter remaining proposals from R2-2203596 to determine which issues are critical to resolve, and progress towards consensus on critical issues.

Intended outcome: Report to Monday CB session in R2-2203622

Deadline: Friday 2022-02-25 1200 UTC

* [AT117-e][629][POS] LS to SA2 on RRC\_INACTIVE positioning (Qualcomm)

Scope: Draft an LS to SA2 indicating our agreements on Low Power Periodic and Triggered 5GC-MT-LR Procedures with SDT for DL-only and RAT-Independent positioning (based on agreed baseline from RAN2#115-e), for UL-only positioning, and for UL+DL positioning (baseline based on R2-2203443), and asking them to take it into account. Include also the information that we have agreed to have RRC state not visible to LMF.

Intended outcome: Approved LS (preferably without CB)

Deadline: Wednesday 2022-03-02 0200 UTC

* [AT117-e][630][POS] Remaining proposals on RRC\_INACTIVE (InterDigital)

Scope:

* Discuss P8 and P10 of R2-2203524 and attempt to reach consensus.
* Check the LS in R2-2202166 and determine if there is impact to our specs.

Intended outcome: Report to Monday CB session in R2-2203607

Deadline: Friday 2022-02-25 1200 UTC

* [AT117-e][631][POS] Remaining OD-PRS issues (Lenovo)

Scope: Discuss P1/P3/P15-1 of R2-2202236 and attempt to converge on the OD-PRS request behaviour.

Intended outcome: Report to Monday CB session in R2-2203601

Deadline: Friday 2022-02-25 1200 UTC

* [AT117-e][632][POS] Merged CR to 38.305 (Intel)

Scope: Merge the endorsed positioning CRs to 38.305.

Intended outcome: Agreeable CR

Deadline: Wednesday 2022-03-02 1000 UTC

* [AT117-e][633][POS] Merged CR to 36.305 (CATT)

Scope: Merge the endorsed positioning CRs to 36.305.

Intended outcome: Agreeable CR

Deadline: Wednesday 2022-03-02 1000 UTC

# Post-Meeting Email Discussions

* [Post117-e][601][Relay] Relay CR to 38.331 (Huawei)

Scope: Update the CR in R2-2203943.

Intended outcome: Agreed CR

Deadline: Thursday 2022-03-10 xxxx UTC (for RP)

* [Post117-e][602][Relay] Relay CR to 38.300 (MediaTek)

Scope: Update and check the CR in R2-2203944.

Intended outcome: Agreed CR

Deadline: Thursday 2022-03-10 xxxx UTC (for RP)

* [Post117-e][603][Relay] Relay CR to 38.323 (Samsung)

Scope: Update and check the CR in R2-2203966.

Intended outcome: Agreed CR

Deadline: Thursday 2022-03-10 xxxx UTC (for RP)

* [Post117-e][604][POS] Positioning CR to 38.331 (Ericsson)

Scope: Update and check the CR in R2-2204022.

Intended outcome: Agreed CR

Deadline: Thursday 2022-03-10 xxxx UTC (for RP)