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

# Status of At-Meeting Email Discussions

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

* [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

 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

 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

 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

 Deadline: Friday 2022-02-25 1000 UTC

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

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

 Intended outcome: Endorsable CR

 Deadline: Friday 2022-02-25 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

 Deadline: Friday 2022-02-25 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

 Deadline: Friday 2022-02-25 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

 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

 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

 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)

 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

 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

 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

 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

 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

 Deadline: Friday 2022-02-25 1200 UTC

# 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%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2202597%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

[R2-2202598](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2202598%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

[R2-2202599](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2202599%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

# 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%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CDocs%5CR2-2202119.zip) Reply LS to RAN2 on the misalignment in SRS configuration (R3-216009; contact: Samsung) RAN3 LS in Rel-16 To:RAN2 Cc:SA2

[R2-2202406](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5C38305_CR0085_%28Rel-16%29_R2-2202406.docx) Miscellaneous corrections in TS 38.305 CATT CR Rel-16 38.305 16.7.0 0085 - F NR\_pos-Core

### 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%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5C38331_CR2890_%28Rel-16%29_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

[R2-2202596](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2202596%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

### 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%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5C37355_CR0326_%28Rel-16%29_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

[R2-2203275](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2203275_%28CR%2037355%20Reference%20TRP%29.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

[R2-2203277](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2203277_%28CR%2037355%20DL%20PRS%20Resources%20per%20PFL%29.docx) Correction to NR-DL-PRS-ResourcesCapability field description Qualcomm Incorporated CR Rel-16 37.355 16.7.0 0331 - F NR\_pos-Core

[R2-2203367](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2203367%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%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2203531%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

[R2-2203368](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2203368%20LPP%20CR%20Segmentation.docx) Clarification on LPP segmentation Ericsson CR Rel-16 37.355 16.7.0 0334 - F NR\_pos-Core

### 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%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2202127_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

[R2-2202136](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2202136_R3-221411.doc) LS on mapping configuration of sidelink relay (R3-221411; contact: Samsung) RAN3 LS in Rel-17 To:RAN2

[R2-2202952](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2202952%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

Work plan and open issues

[R2-2202201](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2202201%20-%20Work%20planning%20for%20R17%20SL%20relay.docx) Work planning for R17 SL relay OPPO, CMCC Work Plan Rel-17 NR\_SL\_relay-Core

[R2-2202202](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2202202%20-%20Remaining%20open%20issues%20for%20R17%20SL%20relay.docx) Remaining open issues for R17 SL relay OPPO discussion Rel-17 NR\_SL\_relay-Core

Running CRs and related documents

[R2-2202343](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2202343%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

[R2-2203324](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5C38.304_CR0232%28Rel-17%29_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

[R2-2203325](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2203325-%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

[R2-2202543](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2202543_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

[R2-2202544](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2202544%20Discussion%20on%20MAC%20CR.doc) Discussion on remaining issues of MAC CR Apple discussion Rel-17 NR\_SL\_relay-Core

[R2-2202950](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2202950-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

[R2-2202951](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2202951-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

[R2-2202819](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2202819_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

[R2-2202820](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2202820%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

[R2-2202276](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CDocs%5CR2-2202276.zip) Running CR for TS 38.351 OPPO draft TS Rel-17 38.351 0.4.0 NR\_SL\_relay-Core

[R2-2203519](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5C38.306_CR0696%28Rel-17%29_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

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%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2202822%20Report%20of%20%5BPre117-e%5D%5B605%5D%5BRelay%5D%20Open%20issues%20on%20relay%20control%20plane%20procedures%20%28Huawei%29.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.

* [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

 Deadline: Tuesday 2022-03-01 1200 UTC

Agenda item summary

[R2-2203591](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2203591%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%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2202184%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%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2202340%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%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2202344.doc) Discussion on notification of cell reselection and HO of a relay UE SHARP Corporation discussion NR\_SL\_relay-Core

[R2-2202345](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2202345.doc) Discussion on SRAP config SHARP Corporation discussion NR\_SL\_relay-Core

[R2-2202357](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2202357.docx) Indication to Upper Layer to Trigger Service Request of L2 Relay CATT discussion Rel-17 NR\_SL\_relay-Core

[R2-2202358](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2202358.docx) Impacts on RAN of AN Release of Relay UE CATT discussion Rel-17 NR\_SL\_relay-Core

[R2-2202379](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2202379%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%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2202411.doc) Remaining open issues on control plane procedures for L2 U2N relay Spreadtrum Communications discussion Rel-17

[R2-2202471](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2202471%20%28R17%20SL%20Relay%20SI_AI8721%20CapturingSIAgreements%29.doc) On Capturing the Agreements Related to SI in the RRC CR InterDigital discussion Rel-17 NR\_SL\_relay-Core

[R2-2202472](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2202472%20%28R17%20SL%20Relay%20SI_AI8721%20CauseValue%29.doc) Cause Value Setting for Connection Establishment for UE to NW Relays InterDigital discussion Rel-17 NR\_SL\_relay-Core

[R2-2202473](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2202473%20%28R17%20SL%20Relay%20SI_AI8721%20HandlingNotificationMessageSidelink%29.doc) Handling the Sidelink Notification Message InterDigital discussion Rel-17 NR\_SL\_relay-Core

[R2-2202567](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2202567.docx) Further Discussion on L2 CP Issue O6.03 vivo discussion

[R2-2202569](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2202569.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%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2202847%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%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2202953%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%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2203135%20CauseCode.docx) Considerations on cause codes Nokia, Nokia Shanghai Bell discussion Rel-17 NR\_SL\_relay\_enh-Core

[R2-2203148](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2203148%20Relay%20Connection%20control.doc) Discussion on connection control open issues Xiaomi discussion

[R2-2203178](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2203178%20Remaining%20issues%20on%20CP.doc) Remaining issues on CP Lenovo, Motorola Mobility discussion NR\_SL\_relay-Core

[R2-2203272](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2203272%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%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2203306_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%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2203308%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%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2203326-%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%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2202356.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].

Other documents

[R2-2202185](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2202185%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%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2202341%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%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2202380%20Remaining%20issues%20on%20service%20continuity.doc) Remaining issues on service continuity ZTE, Sanechips discussion Rel-17

[R2-2202545](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2202545%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%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2202584%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%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2202738_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%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2202821%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%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2202848%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%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2203202.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%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2202200%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%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2202392%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%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2202429%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%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2202675%20-%20Remaining%20issues%20on%20adaptation%20layer.doc) Remaining issue on sidelink adaptation layer Qualcomm Incorporated discussion NR\_SL\_relay-Core

[R2-2202897](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2202897%20Discussion%20on%20UE%27s%20L2%20ID.docx) Discussion on UE's L2 ID Sharp discussion

[R2-2203172](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2203172%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%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2202955%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

Other documents

[R2-2202339](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2202339%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%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2202381%20Miscellaneous%20issues%20on%20bearer%20mapping%20and%20QoS.doc) Miscellaneous issues on bearer mapping and QoS ZTE, Sanechips discussion Rel-17

[R2-2202428](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2202428%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%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2202954%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%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2202378%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

Other documents

[R2-2202186](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2202186%20-%20Remaining%20issues%20on%20discovery%20and%20relay%20%28re%29selection.doc) Remaining issues on discovery and relay (re)selection Qualcomm Incorporated discussion NR\_SL\_relay-Core

[R2-2202412](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2202412.doc) Remaining issues on NotificationMessageSidelink message Spreadtrum Communications discussion Rel-17

[R2-2202568](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2202568.docx) Remaining issues on Discovery and Relay (re)selection vivo discussion

[R2-2202585](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2202585%20Discovery%20and%20Relay%20%28re%29selection%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%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2202849%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%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2203233%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%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2203506.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%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2202676%20-%20Summary%20report%20of%20open%20issues%20on%20relay%20UE%20capabilities%20%28Qualcomm%29.doc) Summary report of offline606 - Open issues on relay UE capabilities (Qualcomm) Qualcomm Incorporated discussion NR\_SL\_relay-Core Late

Other documents

[R2-2202359](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2202359.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%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2202164_R4-2202680.doc) LS on SRS for multi-RTT positioning (R4-2202680; contact: Huawei) RAN4 LS in Rel-17 To:RAN1 Cc:RAN2, RAN3

[R2-2202165](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2202165_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

[R2-2202166](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2202166_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

[R2-2202169](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2202169_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

* [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%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2203717%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

Open issues list

[R2-2202488](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2202488%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

Email discussion reports and related documents

[R2-2202492](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2202492_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

[R2-2202493](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2202493%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

[R2-2203363](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2203363%20Comments.docx) Report on RAN1 parameter list impact to RRC running CR Ericsson discussion Rel-17 Late

Running CRs and related documents

[R2-2202489](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2202489_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%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2202490-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

[R2-2202861](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2202861%20%28Running%20CR%20of%2036_305%20GNSS%20Pos%20Integrity%29.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

[R2-2202862](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2202862%20%28Running%20CR%20of%2038_305%20GNSS%20Pos%20Integrity%29.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

[R2-2203310](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2203310_%2837355%20running%20CR%29_v5.docx) Running LPP CR for NR positioning enhancements Qualcomm Incorporated draftCR Rel-17 37.355 16.7.0 B NR\_pos\_enh-Core

[R2-2203362](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2203362%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

Merged CRs

[R2-2202405](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5C36%20305_CR0107_%28Rel-17%29_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

R2-2202491 38.305 CR for Positioning WI Intel Corporation CR Rel-17 38.305 16.7.0 0086 - B NR\_pos\_enh-Core Late

R2-2203315 Introduction of R17 Positioning Enhancements in LPP Qualcomm Incorporated CR Rel-17 37.355 16.7.0 0332 - B NR\_pos\_enh-Core Late

[R2-2203364](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2203364%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

[R2-2202605](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2202605%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

[R2-2202606](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2202606%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

### 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%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2202604%20%5BPre117-e%5D%5B607%5D%5BPOS%5D%20Open%20issues%20on%20positioning%20latency%20enhancements%20%28Huawei%29.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%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2203592-summary-latency-v1.docx) Summary of AI 8.11.2.1 Apple discussion

* Revised in R2-2203596

[R2-2203596](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2203596-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

 Deadline: Friday 2022-02-25 1200 UTC

The following documents will not be individually treated

[R2-2202408](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2202408%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%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2202487.docx) On Latency Reduction open issues Intel Corporation discussion Rel-17 NR\_pos\_enh-Core

[R2-2202592](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2202592-positioning-latency-v0.docx) On remaining issues for latency improvements Apple discussion

[R2-2202603](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2202603%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%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2202858%20%28R17%20NR%20POS%20WI_AI81121_Latency%29.doc) Remaining Issues on Latency Reduction InterDigital, Inc. discussion Rel-17 NR\_pos\_enh-Core

[R2-2202922](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2202922%20MAC%20CE%20for%20pre-MG%20%28de%29activation%20request.docx) MAC CE for pre-MG (de)activation request Samsung discussion Rel-17 NR\_pos\_enh-Core

[R2-2202930](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2202930%20Remaining%20issue%20on%20positioning%20latency%20reduction.doc) Remaining issue on positioning latency reduction Xiaomi discussion

[R2-2203042](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2203042_MultiplePreconfiguredAssistanceData.docx) Way forward for preconfigured assistance data Fraunhofer IIS; Fraunhofer HHI; Ericsson; discussion

[R2-2203088](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2203088%20Discussion%20on%20Latency%20enhancements.docx) Discussion on latency enhancement vivo discussion Rel-17 NR\_pos\_enh-Core

[R2-2203181](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2203181%20Discussion%20on%20open%20issues%20of%20positioning%20latency%20enhancements.docx) Discussion on open issues of positioning latency enhancements ZTE discussion

[R2-2203204](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2203204_Pos_latency.docx) Considerations on positioning measurement report latency Sony discussion Rel-17 NR\_pos\_enh-Core

[R2-2203211](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2203211%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%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2203360%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%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2203524_Pre117%20POS%20609_Open%20issues%20on%20positioning%20in%20RRC_INACTIVE%20%28InterDigital%29_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

 Deadline: Friday 2022-02-25 1200 UTC

Other documents

[R2-2202338](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2202338-%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%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2202601%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%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2202602%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%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2203089%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%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2203091%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%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2203180%20Discussion%20on%20UL%20positioning%20configuration%20in%20RRC_INACTIVE.docx) Discussion on UL positioning configuration in RRC\_INACTIVE ZTE discussion

[R2-2203443](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2203443_%28Positioning%20in%20RRC_INACTIVE%29.docx) Remaining issues for positioning of UEs in RRC\_INACTIVE State Qualcomm Incorporated discussion

[R2-2203444](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2203444_%28LS%20to%20SA2%20on%20RRC_INACTIVE%29.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%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2203445%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

#### 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%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2202236_%5BPre117-e%5D%5B608%5D%5BPOS%5D%20Open%20issues%20on%20on-demand%20PRS%20%28Lenovo%29_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

 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.

Other documents

[R2-2202337](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2202337%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%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2202409%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%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2202859%20%28R17%20NR%20POS%20WI_AI81123_OnDemandPRS%29.doc) Remaining Issues for On-demand PRS InterDigital, Inc. discussion Rel-17 NR\_pos\_enh-Core

[R2-2203169](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2203169%20%288.11.2.3%29_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%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2203463%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%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2203525%20Summary%20of%20%5BPre117-e%5D%5B610%5D%5BPOS%5D%20Open%20issues%20GNSS%20integrity%20%28ESA%29.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%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2203593%20%5BAT117-e%5D%5B623%5D%5BPOS%5D%20Summary%20-%20Open%20issues%20GNSS%20integrity%20%28ESA%29.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%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2203034_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%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2203090%20Discussion%20on%20GNSS%20positioning%20integrity.docx) Discussion on GNSS positioning integrity vivo discussion Rel-17 NR\_pos\_enh-Core

[R2-2203199](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2203199%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%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2203359%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%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5C37.355_CR0327_%28Rel-17%29_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

[R2-2202403](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5C36.305_CR0106_%28Rel-17%29_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

[R2-2202404](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5C38.305_CR0084_%28Rel-17%29_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

[R2-2202607](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2202607%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

[R2-2203710](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2203710%20NaVIC.docx) Introduction of NavIC for broadcast support Ericsson draftCR Rel-17 38.331 16.7.0 B NR\_pos\_enh-Core

#### 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%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2202410%20Report%20of%20%5BPre117-e%5D%5B611%5D%5BPOS%5D%20Open%20issues%20on%20positioning%20accuracy%20enhancements%20%28CATT%29.docx) Report of [Pre117-e][611][POS] Open issues on positioning accuracy enhancements (CATT) CATT discussion Late

Other documents

[R2-2202593](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2202593-UE-TX-TEG-RRC-v0.docx) On UE Tx TEG association for UL-TDOA via RRC Apple discussion

[R2-2202860](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2202860%20%28R17%20NR%20POS%20WI%20AI81126_AccEnh%29.doc) Remaining Issues for Accuracy Enhancements InterDigital, Inc. discussion Rel-17 NR\_pos\_enh-Core

[R2-2203205](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2203205_Pos_TEG.docx) Considerations on Timing Error aspects Sony discussion Rel-17 NR\_pos\_enh-Core

[R2-2203361](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2203361%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%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2203462%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%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2202494_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

Running CRs

[R2-2202495](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2202495%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

[R2-2202496](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202202-03%20-%20RAN2_117-e%2C%20Online%5CExtracts%5CR2-2202496%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

### 8.11.3 Other

Any other topics on NR positioning enhancements.