3GPP TSG-RAN WG2 Meeting #116bis-e R2-22xxxxx

Online, 17-25 January 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.

* [AT116bis-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: Tuesday 2022-01-25 1800 UTC

* [AT116bis-e][606][Relay] CT1 LS on discovery (CATT)

Scope: Discuss the LS in R2-2200062, determine any RAN2 spec impact, and draft a reply.

Intended outcome: Approvable LS in R2-2201696 and report to Tuesday CB session on spec impact in R2-2201695

Deadline: Monday 2022-01-24 1800 UTC

* [AT116bis-e][607][Relay] Relay UE capabilities (Qualcomm)

Scope: Start discussion of UE capabilities for relaying, with R2-2200178 as an initial input, and attempt to conclude on a baseline set of capabilities for a draft CR to 38.306.

Intended outcome: Report to Tuesday CB session

Deadline: Monday 2022-01-24 1800 UTC

* [AT116bis-e][608][Relay] RAN sharing (Huawei)

Scope: Discuss the issue of RAN sharing for relays, taking into account the related parts of contributions from AI 8.7.2.1. Conclude on what will be supported and analyse spec impact (conclusions to be taken into account by rapporteurs of affected running CRs).

Intended outcome: Report to Tuesday CB session

Deadline: Monday 2022-01-24 1800 UTC

* [AT116bis-e][609][Relay] Open issues on discovery (InterDigital)

Scope: Start discussion of the inputs on discovery from AI 8.7.3.1 with focus on the open issues identified by the rapporteur in R2-2200365, and converge where possible.

Intended outcome: Report to Thursday online session in R2-2101763

Deadline: Wednesday 2022-01-19 1800 UTC

* [AT116bis-e][610][POS] Positioning UE capabilities (Intel)

Scope: Start discussion of UE capabilities for positioning, with R2-2200284 as an initial input, and attempt to conclude on a baseline set of capabilities to be reflected in 38.331/38.306 and 37.355.

Intended outcome: Report to Monday CB session in R2-2201767

Deadline: Friday 2022-01-21 1600 UTC

* [AT116bis-e][611][POS] GNSS integrity (Swift)

Scope: Start discussion of the proposals from R2-2200012 to determine agreeability and resulting spec impact. Extended to develop initial stage 3 proposals taking R2-2201214 into account, including value range and resolution of parameters where possible.

Intended outcome: Report to Wednesday online session in R2-2201761 (including revision of R2-2200012 if needed); for extension, report to Monday CB session in R2-2201765.

Deadline: Tuesday 2022-01-18 2200 UTC – extended to Friday 2022-01-21 1800 UTC

* [AT116bis-e][612][POS] Positioning accuracy enhancements (Apple)

Scope: Discuss the contributions in AI 8.11.7 on accuracy enhancements (excluding PRU topics). Determine agreeable RAN2 spec impact from RAN1 conclusions and identify any issues requiring further RAN2 discussion.

Intended outcome: Report to Monday CB session in R2-2201768, draft LS to RAN1 in R2-2201869

Deadline: Friday 2022-01-21 1600 UTC

* [AT116bis-e][613][POS] BDS and NavIC CRs (CATT)

Scope: Review the draft CRs in R2-2200298/R2-2201070/R2-2200433, collect any comments, and revise the CRs if needed.

Intended outcome: Endorsed draft CRs (without CB) and report in R2-2201775

Deadline: Friday 2022-01-21 1600 UTC

* [AT116bis-e][614][POS] PRUs (Huawei)

Scope: Discuss the contributions on PRUs in AIs 8.11.7/8.11.8 and the related LSs in R2-2200139/R2-2200140, determine agreeable way forward, and analyse RAN2 spec impact. Draft a reply LS to SA2 if needed.

Intended outcome: Report to Monday CB session in R2-2200438 [tdoc number allocated before the meeting], and approvable LS if one is needed

Deadline: Friday 2022-01-21 1600 UTC

* [AT116bis-e][615][Relay] Support of idle/inactive relay UE in path switch (Intel)

Scope: Discuss and attempt to converge on the possible support of a relay UE in RRC\_IDLE or RRC\_INACTIVE during direct-to-indirect path switch.

Intended outcome: Report to online session in R2-2201764

Deadline: Thursday 2022-01-20 1600 UTC

* [AT116bis-e][616][POS] Remaining proposals on latency reduction (Qualcomm)

Scope: Discuss the remaining proposals on validity conditions for preconfigured assistance data, measurement gaps, and PRS processing window.

Intended outcome: Report to CB session in R2-2201875

Deadline: Friday 2022-01-21 1600 UTC

* [AT116bis-e][617][POS] Remaining issues on positioning in RRC\_INACTIVE (Ericsson)

Scope: Discuss the remaining prioritised proposals from R2-2201068.

Intended outcome: Report to CB session in R2-2201772

Deadline: Friday 2022-01-21 1600 UTC

* [AT116bis-e][618][Relay] Remaining issues on relay control plane (OPPO)

Scope: Discuss the remaining proposals from R2-2201407.

Intended outcome: Report to CB session in R2-2201762

Deadline: Monday 2022-01-24 1800 UTC

* [AT116bis-e][619][Relay] Remaining proposals on adaptation layer (Ericsson)

Scope: Discuss the remaining proposals from R2-2200943: P6/P3/P9.

Intended outcome: Report to CB session

Deadline: Monday 2022-01-24 1800 UTC

* [AT116bis-e][620][Relay] LS to SA2 on discovery and data associated to different L2IDs (vivo)

Scope: Draft an LS to SA2 indicating the assumption from proposal 2.1 of R2-2101763.

Intended outcome: Approved LS (with no CB if possible)

Deadline: Monday 2022-01-24 1800 UTC

# 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: 6 tdocs

Email max expectation: 7 threads

### 8.7.1 Organizational

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

Work plan and open issues, for information

[R2-2200038](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200038%20-%20Work%20planning%20for%20R17%20SL%20relay.docx) Work planning for R17 SL relay OPPO, CMCC Work Plan Rel-17 NR\_SL\_relay-Core

* Noted (email discussion [AT116bis-e][600])

[R2-2200365](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200365%20-%20Remaining%20open%20issues%20for%20R17%20SL%20relay.docx) Remaining open issues for R17 SL relay OPPO discussion Rel-17 NR\_SL\_relay-Core

* Noted (email discussion [AT116bis-e][600])

Incoming LS and draft reply

[R2-2200062](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Docs\R2-2200062.zip) LS on the indication of discovery message and PC5-S signalling to ProSe layer (C1-217167; contact: CATT) CT1 LS in Rel-17 5G\_ProSe To:RAN2 Cc:SA2

[R2-2200165](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200165.docx) Indication of Discovery Message and PC5-S Signalling to ProSe Layer CATT discussion Rel-17 NR\_SL\_relay-Core

* Noted (email discussion [AT116bis-e][600])
* To be considered in email discussion [AT116bis-e][606]

[R2-2200366](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200366%20-%20Discussion%20on%20C1-217167.docx) Discussion on C1-217167 OPPO discussion Rel-17 NR\_SL\_relay-Core

* Noted (email discussion [AT116bis-e][600])
* To be considered in email discussion [AT116bis-e][606]
* [AT116bis-e][606][Relay] CT1 LS on discovery (CATT)

Scope: Discuss the LS in R2-2200062, determine any RAN2 spec impact, and draft a reply.

Intended outcome: Approvable LS in R2-2201696 and report to Tuesday CB session on spec impact in R2-2201695

Deadline: Monday 2022-01-24 1800 UTC

R2-2201695 (Summary of [606]) CATT discussion Rel-17 NR\_SL\_relay-Core

R2-2201696 LS reply on the indication of discovery message and PC5-S signalling to ProSe layer CATT LS out Rel-17 NR\_SL\_relay-Core To:CT1 Cc:SA2

UE capability

[R2-2200178](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200178%20-%20Initial%20consideration%20on%20UE%20capability%20of%20sidelink%20relay.doc) Initial consideration on UE capability of sidelink relay Qualcomm Incorporated discussion NR\_SL\_relay-Core

* To be considered in email discussion [AT116bis-e][607]

Running CRs

[R2-2200364](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Docs\R2-2200364.zip) Running CR for TS 38.351 OPPO draft TS Rel-17 38.351 0.2.0 NR\_SL\_relay-Core

* Noted (email discussion [AT116bis-e][600])

[R2-2200658](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200658%20Running%20CR%20of%2038.322%20for%20SL%20relay.docx) Running CR of 38.322 for SL Relay Samsung draftCR Rel-17 38.322 16.2.0 B NR\_SL\_relay-Core

* Noted (email discussion [AT116bis-e][600])

[R2-2200659](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200659%20Running%20CR%20of%2038.323%20for%20SL%20relay.docx) Running CR of 38.323 for SL Relay Samsung draftCR Rel-17 38.323 16.6.0 B NR\_SL\_relay-Core

* Noted (email discussion [AT116bis-e][600])

[R2-2200789](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200789%20Stage%202%20Running%20CR%20on%20Introduction%20of%20R17%20SL%20Relay.docx) Stage 2 Running CR on Introduction of R17 SL Relay MediaTek Inc. draftCR Rel-17 38.300 16.8.0 B NR\_SL\_relay-Core

* Noted (email discussion [AT116bis-e][600])

[R2-2201160](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2201160-%20Running%20CR%20of%2038.304%20for%20SL%20relay.docx) Running CR of 38.304 for SL relay Ericsson draftCR Rel-17 38.304 16.7.0 B NR\_SL\_relay-Core

* Noted (email discussion [AT116bis-e][600])

[R2-2201507](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2201507%20RRC%20running%20CR%20for%20SL%20relay.docx) RRC running CR for SL relay Huawei, HiSilicon draftCR Rel-17 38.331 16.7.0 B NR\_SL\_relay-Core R2-2111490

* Noted (email discussion [AT116bis-e][600])

[R2-2201508](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2201508%20Stage3%20open%20issues%20in%20SL%20relay%20RRC%20running%20CR.docx) Stage3 open issues in RRC running CR Huawei, HiSilicon discussion Rel-17 NR\_SL\_relay-Core

* Noted (email discussion [AT116bis-e][600])
* Above CRs to be updated and endorsed by post-meeting discussion

Comments on running CRs (to be considered by rapporteurs)

[R2-2200944](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200944%20PCR-stage2-corrections.docx) Stage 2 corrections for SL Relay Nokia, Nokia Shanghai Bell, Ericsson draftCR Rel-17 38.300 16.8.0 NR\_SL\_relay-Core

* Noted (email discussion [AT116bis-e][600])

[R2-2200945](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200945%20PCR-RRC-corrections.docx) RRC corrections for SL Relay Nokia, Nokia Shanghai Bell, Ericsson draftCR Rel-17 38.331 16.7.0 NR\_SL\_relay-Core

* Noted (email discussion [AT116bis-e][600])
* Above documents to be taken into account by the rapporteurs of the related running CRs

### 8.7.2 L2 relay specific topics

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

#### 8.7.2.1 Control plane procedures

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

Summary document

[R2-2201407](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2201407%20-%20Summary%20of%20AI%208.7.2.1_V3.0.docx) Summary of AI 8.7.2.1 on CP procedure OPPO discussion Rel-17 NR\_SL\_relay-Core Late

Easy-ones:

Working assumptions and related issues:

Recommendation 0-2: For WA of “Any SIB which the remote UE has a requirement to use (e.g. for relay purpose) can be requested by the remote UE (from the relay UE or the network). [20/23] FFS how to capture this in spec, but this agreement does not automatically imply signalling to request all SIBs.”, agree on a revised version of “Any SIB which the RRC\_IDLE/RRC\_INACTIVE remote UE has a requirement to use (e.g. for relay purpose) can be requested by the remote UE (from the relay UE or the network). RAN2 not pursue further specification work for remote UE using an indirect connection to network to make use of a SIB if it is not supported based on the current spec.”

Recommendation 0-4: For the WA of “cellAccessRelatedInfo from SIB1 [16/23] is forwarded before PC5-RRC connection. FFS the exact signalling”, agree on a revised version of “cellAccessRelatedInfo from SIB1 [16/23] is forwarded before PC5-RRC connection using discovery message when there is no RAN sharing. RAN sharing case is FFS. FFS on using RRC container or not”.

Recommendation 1-3: Carry cellAccessRelatedInfo from SIB1 in discovery message using RRC container.

Discussion:

Lenovo think R0-2 should be slightly reworded as “any SIB which the remote UE needs” without exemplary brackets.

vivo think there is no technical motivation for 0-4 in the case of no RAN sharing; they agree that is RAN sharing is supported it would be needed.

Ericsson would like to keep the current form of 0-2 as it was a compromise from last meeting.

OPPO agree we could keep the current wording of 0-2 rather than discuss further. On 0-4, their understanding is that companies believe in the non-RAN-sharing case, it is still helpful for the remote UE to determine how to make use of these parameters.

Qualcomm understand that in 0-4, the mention of the non-RAN-sharing case is to clarify that the agreement does not imply support of RAN sharing.

Lenovo think the second sentence of 0-2 can only be agreed after we have looked at 0-3 and 1-4. LG agree. OPPO understand that 0-3 and 1-4 are about how to deliver the SIB, not which SIBs would be supported. Ericsson, Intel, and Qualcomm have the same understanding.

CATT think the second FFS in 0-4 should be cancelled if we agree to 1-3.

vivo still think the technical motivation of 0-4 is lacking.

Ericsson ask if we should inform SA2 of the agreements on cellAccessRelatedInfo, and want to confirm that only the cellAccessRelatedInfo would be forwarded. OPPO indicate there is an upcoming proposal that covers the coordination with SA2. Nokia support informing SA2.

Agreements:

Any SIB which the RRC\_IDLE/RRC\_INACTIVE remote UE has a requirement to use (e.g. for relay purpose) can be requested by the remote UE (from the relay UE or the network). RAN2 not pursue further specification work for remote UE using an indirect connection to network to make use of a SIB if it is not supported based on the current spec.

cellAccessRelatedInfo from SIB1 [16/23] is forwarded before PC5-RRC connection using discovery message when there is no RAN sharing. RAN sharing case is FFS.

Carry cellAccessRelatedInfo from SIB1 in discovery message using RRC container.

Paging information:

Recommendation 2-3: RRC\_INACTIVE Remote UE provides minimum value of two UE specific DRX cycles (configured by upper layer and configured by RAN) , 5G-S-TMSI and I-RNTI to relay UE, and RRC\_IDLE UE provides the UE specific DRX cycle (configured by upper layer) and 5G-S-TMSI to relay UE.

Recommendation 2-4: Relay UE uses SUI message to provide remote UE information (i.e. 5G-S-TMSI/I-RNTI) to network.

Agreements:

RRC\_INACTIVE Remote UE provides minimum value of two UE specific DRX cycles (configured by upper layer and configured by RAN) , 5G-S-TMSI and I-RNTI to relay UE, and RRC\_IDLE UE provides the UE specific DRX cycle (configured by upper layer) and 5G-S-TMSI to relay UE.

Relay UE uses SUI message to provide remote UE information (i.e. 5G-S-TMSI/I-RNTI) to network.

Timers:

Recommendation 4-2: Introduce new fields in SIB1 for T300-like/T319-like/T301-like timers to be used by L2 remote UE. For these timers, on top of existing stop conditions as for the legacy timers, add extra stop condition for relayed scenario, i.e., “the (re)selected relay becomes unsuitable” for T300-like timer, “relay (re)selection” for T319-like timer, and “the (re)selected relay becomes unsuitable” for T301-like timer. FFS whether the legacy stop-condition of “when the selected cell becomes unsuitable” is still applicable to T301.

Recommendation 4-3: Not introduce new T311-like timer for L2 remote UE. Add extra stop-condition in the legacy T311 timer for relayed scenario, i.e., “upon (re)selection of a suitable relay”.

Discussion:

Lenovo are fine with the proposals but want to clarify if this directly implies the stage 3 design. Chair understands that it means new timers with new fields in SIB1; OPPO have the same understanding. Lenovo think we should minimise signalling. Ericsson and OPPO think we can discuss in the running CR.

LG wonder in 4-2 if the T300-like timer is similar to the original T300 with “relay UE” replacing “gNB”. OPPO are not sure of the intent of the question but think the key point is that we need to revise the conditions relative to the legacy T300 timer, and further details can be left to stage 3.

Agreements:

Introduce new fields in SIB1 for T300-like/T319-like/T301-like timers to be used by L2 remote UE. For these timers, on top of existing stop conditions as for the legacy timers, add extra stop condition for relayed scenario, i.e., “the (re)selected relay becomes unsuitable” for T300-like timer, “relay (re)selection” for T319-like timer, and “the (re)selected relay becomes unsuitable” for T301-like timer. FFS whether the legacy stop-condition of “when the selected cell becomes unsuitable” is still applicable to T301.

Not introduce new T311-like timer for L2 remote UE. Add extra stop-condition in the legacy T311 timer for relayed scenario, i.e., “upon (re)selection of a suitable relay”.

Other:

Recommendation 4-5: PCI of relay UE serving cell can be delivered to remote UE in the same way as for C-RNTI, i.e., using RRCSetup / RRCResume / RRCReestablishment / RRCReconfiguration.

Recommendation 4-6: For a L2 remote UE which is in RRC\_CONNECTED and has triggered the RRC connection re-establishment procedure, it is up to remote UE implementation to selects either the best relay UE or the best cell, i.e., no consideration of the cell ID of the relay UE. Otherwise, for a L2 remote UE which is in RRC\_CONNECTED and has not triggered the RRC connection re-establishment procedure, the usage of cell ID for the remote UE is up to gNB implementation.

Recommendation 4-7: RAN2 not pursue default Uu RLC configuration for SRB0 messages and SRB1 messages of RRCReestablishment and RRCresume for remote UE.

Discussion:

ZTE think in 4-6, since we leave selection of relay or cell to remote UE implementation, it does not need to prohibit the remote UE from considering the cell ID. Chair thinks it was intended to say “no requirement for consideration of the cell ID”.

Lenovo think the last sentence of 4-6 should refer to “the usage of cell ID for the mobility of the remote UE”.

LG think 4-7 applies only when relay UE is in RRC\_CONNECTED and we should capture this in the proposal. Chair and OPPO understand the proposal is generally not to have the default configuration.

vivo understand that 4-6 implies the remote UE would select a relay/cell above the threshold, but not necessarily the best one. Chair suggests “a suitable” instead of “best”.

InterDigital want to understand the second half of 4-6: Does it mean which cell is selected is up to gNB when the remote UE has not triggered re-establishment, and if so, is this any different from legacy procedures? OPPO understand that it is legacy procedures. Ericsson agree with OPPO.

Ericson are OK in principle with 4-7 but wonder if we do not use a default configuration, whether it means we would have a fixed/specified configuration. OPPO think we have a previous agreement that we rely on network configuration, and the question is whether a default would be defined on top of that. Ericsson wonder how e.g. the ReestablishmentRequest would be delivered via SRB0 in this case. OPPO understand that the SUI message from the relay will indicate the remote UE information to the network, and the network will configure the related Uu RLC channels them. Qualcomm understand the previous agreement was for PC5. Huawei agree with OPPO.

Apple understand that 4-7 adds some latency because of waiting for the SUI, so they see some advantage to the default configuration, but they can accept majority view.

Xiaomi think we could clarify that we do not pursue fixed or default configuration in 4-7.

Agreements:

PCI of relay UE serving cell can be delivered to remote UE in the same way as for C-RNTI, i.e., using RRCSetup / RRCResume / RRCReestablishment / RRCReconfiguration.

For a L2 remote UE which is in RRC\_CONNECTED and has triggered the RRC connection re-establishment procedure, it is up to remote UE implementation to selects either a suitable relay UE or a suitable cell, i.e., no requirement for consideration of the cell ID of the relay UE. Otherwise, for a L2 remote UE which is in RRC\_CONNECTED and has not triggered the RRC connection re-establishment procedure, the usage of cell ID for the mobility of the remote UE is up to gNB implementation.

RAN2 not pursue default or fixed Uu RLC configuration for SRB0 messages and SRB1 messages of RRCReestablishment and RRCresume for remote UE, i.e. rely on network configuration.

For-discussion ones:

Working assumptions:

Recommendation 0-1: For WA of “A remote UE in RRC\_IDLE/RRC\_INACTIVE initiates RNAU/TAU procedure if the serving cell of the relay UE changes (due to HO or reselection of the relay UE) and the new serving cell is outside of the remote UE’s configured RNA/TA, as legacy procedure.”, agree on a revised version of “A remote UE in RRC\_IDLE/RRC\_INACTIVE initiates RNAU/TAU procedure if the serving cell changes and the new serving cell is outside of the remote UE’s configured RNA/TA, as legacy procedure. For an indirect remote UE, its serving cell is the serving cell of its connected relay UE.”

Recommendation 0-3: For the WA of “Voluntary SIB forwarding by the relay UE, aside from SIB update and SIB request, is left to relay UE implementation”, agree on a revised version of “Voluntary SIB1 forwarding, aside from SIB update and SIB request, is left to relay UE implementation. Voluntary SIB forwarding by the Relay UE for SIB update is allowed.”

Discussion:

On 0-3, Lenovo think the word “voluntary” is hard to understand. They think SIB1 must be provided to the remote UE and we need to guarantee that it is delivered somehow, and consider which information is needed. They also think we should not leave the relay UE free to provide something that is completely unnecessary for the remote UE.

InterDigital think the change to 0-1 diverges from the initial WA. Originally we were focussed on the case that the relay UE changes cell based on HO/reselection, and this is not captured in the new wording.

Ericsson think on 0-3, a smart UE implementation would voluntarily forward only SIB1 and SIB12. They are generally fine with the WA and wonder if we need to over-clarify all the cases.

Lenovo think we cannot leave SIB1 to relay UE implementation in 0-3.

Qualcomm understand “voluntary” in 0-3 to mean “without request from the remote UE”. They understand that we left it to implementation because the remote UE might acquire SIB1 from the gNB directly and it would not be necessary to forward it also from the relay. They think we should cover the case of SIB update in a way that we do not need to depend on a re-request from the remote UE.

LG think SIB1 is always requested by the remote UE if not received directly.

OPPO think the word “voluntary” is important to clarify that this is for the case where the remote UE has not requested, and the overall point of the discussion is that some companies think SIB1 is always delivered by the relay UE without explicit request from the remote UE.

Nokia suggest “unsolicited” instead of “voluntary”, and they agree that SIB1 should be considered always requested.

MediaTek think we need to clarify if SIB1 forwarding is applicable for SIB update. They think there is a problem with the original WA because SIB update and SIB request cover all the cases in which forwarding would be needed. Qualcomm agree with MediaTek.

Ericsson wonder if we can apply the Uu principle where the network needs to guarantee that SIB1 is always delivered to the UE (dedicated or broadcast) so the UE can check SI scheduling. So if the relay UE does not deliver SIB1, the remote UE cannot check the SI scheduling, and we could say the relay UE guarantees SIB1 is always provided. Nokia agree with Ericsson.

Lenovo suggest: (1) SIB1 is always delivered by the relay UE; (2) at least part of SIB1 (besides cellAccessRelatedInfo) is forwarded in the discovery messages.

Agreements:

A remote UE in RRC\_IDLE/RRC\_INACTIVE initiates RNAU/TAU procedure if the serving cell changes (due to cell change by the relay UE) and the new serving cell is outside of the remote UE’s configured RNA/TA, as legacy procedure. For an indirect remote UE, its serving cell is the serving cell of its connected relay UE.

For SIBs that have been requested by the remote UE from the relay UE, the relay UE forwards them in case of SIB update at least for remote UE in idle/inactive (FFS RRC\_CONNECTED).

The relay UE always forwards SIB1 if SIB1 changes at least for remote UE in idle/inactive (FFS RRC\_CONNECTED). The remote UE always is considered to request SIB1 if it has not received it directly from the gNB; FFS if the request is explicit or implicit.

FFS (for further offline discussion this meeting) unsolicited SIB1 forwarding or whether the request-based solution is always used.

SI forwarding:

Recommendation 1-1: For SIB-update in case of RRC\_IDLE/RRC\_INACTIVE remote UE(s), RAN2 further discuss to select between option-1) to forward either all updated SI, option-2) only the SI(s) requested by remote UE(s), or option-3) leave it to relay-UE implementation to select between option-1 or option-2. RAN2 do not pursue further work on enhance the SI-request signalling by remote UE.

Recommendation 1-2: For SIB-update in case of RRC\_CONNECTED remote-UE, no short message forwarding by relay UE, and RAN2 discuss to select between option-1) rely on network implementation to send either all updated SIBs or only the updated SIBs requested by remote UE, and option-2) rely on relay UE to send all updated SIB to remote UE.

Recommendation 1-3a (modified): [wrt forwarding of cellAccessRelatedInfo] RAN2 further discuss to select 1) rely on SA2 to decide which discovery message (primary message or the additional information message), or 2) decide it in RAN2 (if so, discuss to make the selection). FFS on whether cellBarred should be included as well.

Recommendation 1-4: For SIB1, RAN2 discuss how to deliver it, between 1) using discovery message, reuse the conclusion for cellAccessRelatedInfo, or 2) using PC5-RRC message, in the same way as for other SIBs.

Paging:

Recommendation 2-1: RAN2 further discuss to select between option-1) Paging message sent over PC5-RRC uses PagingRecordList IE and rely on relay UE implementation to select between either sending the entire paging record received by the relay UE or sending only information relevant to that remote UE, option-2) Sending the entire PagingRecordList received by the relay UE, and option-3) sending only PagingRecord relevant to that remote UE.

Recommendation 2-2: RAN2 further discuss the PC5-RRC signalling content, which is used for Relay UE in RRC\_CONNECTED configured with paging CSS, to determine whether to monitor POs for a remote UE, between 1) using explicit signalling indicating RRC-state of remote-UE, 2) not using explicit signalling indicating RRC-state of remote-UE.

Recommendation 2-5: Network uses RRCReconfiguration, to carry remote UE paging message to the RRC\_CONNECTED relay UE in dedicated fashion.

Cause value:

Recommendation 3-1: RAN2 further discuss to select between using existing or new cause value for relay UE to establish/resume an RRC connection due to a connection of remote UE, without introducing new AS-layer signalling from remote UE to relay UE.

RAN sharing (discussed in email discussion [608]):

Recommendation 4-1: RAN2 agree the support of RAN sharing scenario for L2 UE-to-Network relay when the remote UE registers to the same PLMN as the relay UE. For the RAN sharing scenario for L2 UE-to-Network relay when the remote UE registers to the different PLMN as the relay UE, RAN2 further discuss to conclude on whether major additional RAN2 specification work is needed.RAN2 send LS to SA2 (and SA3 and RAN3) about RAN2 conclusion.

C-RNTI in RRCRelease:

Recommendation 4-4: RAN2 discuss whether to deliver C-RNTI value via RRCRelease message.

* [AT116bis-e][618][Relay] Remaining issues on relay control plane (OPPO)

Scope: Discuss the remaining proposals from R2-2201407.

Intended outcome: Report to CB session in R2-2201762

Deadline: Monday 2022-01-24 1800 UTC

WA confirmation joint proposal

[R2-2200367](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200367%20-%20Remaining%20WA%20for%20R17%20SL%20Relay_V4.1.docx) Remaining WA for R17 SL Relay OPPO, Qualcomm Incorporated, Samsung, Intel Corporation, Apple, Huawei, HiSilicon, MediaTek Inc., Xiaomi, Nokia, Nokia Shanghai Bell, Ericsson discussion Rel-17 NR\_SL\_relay-Core

The following documents will not be individually treated

[R2-2200166](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200166.docx) Control Plane Procedures of L2 Relay CATT discussion Rel-17 NR\_SL\_relay-Core

[R2-2200172](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200172%20-%20Remaining%20issues%20on%20RRC%20connection%20management%20of%20L2%20U2N%20relay.doc) Remaining issues on RRC connection management of L2 U2N relay Qualcomm Incorporated discussion NR\_SL\_relay-Core

[R2-2200173](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200173%20-%20Remaining%20issues%20on%20paging%20and%20SIB%20forwarding%20in%20L2%20U2N%20relay.doc) Remaining issues on paging and SIB forwarding in L2 U2N relay Qualcomm Incorporated discussion NR\_SL\_relay-Core

[R2-2200226](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200226_SL_CP_Intel.docx) Leftover issues of Control plane procedures for L2 U2N relaying Intel Corporation discussion Rel-17 NR\_SL\_relay-Core

[R2-2200372](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200372-%20Left%20issues%20on%20Control%20Plane%20Aspects%20for%20L2%20Relay.docx) Left Issues on Control Plane Aspects for L2 Relay OPPO discussion Rel-17 NR\_SL\_relay-Core

[R2-2200410](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200410%20Monitoring%20Paging%20by%20a%20U2N%20Relay.doc) Monitoring Paging by a U2N Relay Lenovo, Motorola Mobility discussion NR\_SL\_relay-Core

[R2-2200412](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200412%20SI%20acquisition%20by%20a%20remote%20UE.doc) SI acquisition by a remote UE Lenovo, Motorola Mobility discussion NR\_SL\_relay-Core

[R2-2200471](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200471_%20Open%20issues%20on%20L2%20Control%20Plane%20Procedures.docx) Open issues on L2 Control Plane Procedures vivo discussion

[R2-2200512](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200512%20Discussion%20on%20RRC%20reestablishment%20related%20parameters%20for%20L2%20sidelink%20relay%20v1%20CTC.docx) Discussion on RRC reestablishment related parameters for L2 sidelink relay China Telecom discussion Rel-17 NR\_SL\_relay-Core

[R2-2200551](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200551%20Remaining%20issues%20for%20Control%20plane.docx) Remaining issues for Control plane MediaTek Inc. discussion Rel-17

[R2-2200552](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200552%20RAN%20sharing.docx) RAN sharing MediaTek Inc., CATT, OPPO, Qualcomm Incorporated, ZTE, Huawei, HiSilicon, Apple, InterDigital discussion Rel-17

[R2-2200625](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200625.doc) Left issues on control plane procedures for L2 U2N relay Spreadtrum Communications discussion Rel-17

[R2-2200653](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200653%20Remaining%20issues%20for%20paging%20and%20SI%20delivery.doc) Remaining issues for paging and SI delivery Samsung discussion Rel-17 NR\_SL\_relay-Core

[R2-2200740](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200740%20Discussion%20on%20sidelink%20RLC%20bearer%20management%20for%20L2%20U2N%20relay.docx) Discussion on sidelink RLC bearer management for L2 U2N relay ASUSTeK discussion Rel-17 38.331 NR\_SL\_relay-Core

[R2-2200741](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200741%20Discussion%20on%20missing%20procedural%20text%20for%20applying%20C-RNTI%20of%20Remote%20UE.docx) Discussion on missing procedural text for applying C-RNTI of Remote UE ASUSTeK discussion Rel-17 38.331 NR\_SL\_relay-Core

[R2-2200742](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200742%20Discussion%20on%20missing%20procedural%20text%20for%20Relay%20UE%20to%20apply%20SL-RLC0%20configuration.docx) Discussion on missing procedural text for Relay UE to apply SL-RLC0 configuration ASUSTeK discussion Rel-17 38.331 NR\_SL\_relay-Core

[R2-2200743](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200743%20Reflecting%20Stage%202%20agreement%20on%20sidelink%20resource%20allocation%20mode%20for%20U2N%20relay.docx) Reflecting Stage 2 agreement on sidelink resource allocation mode for U2N relay ASUSTeK discussion Rel-17 38.331 NR\_SL\_relay-Core

[R2-2200776](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200776%20Considerations%20on%20CP%20issues%20v1.0.doc) Considerations on CP issues Lenovo, Motorola Mobility discussion Rel-17

[R2-2200784](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200784%20Further%20Issues%20on%20Paging%20in%20NR%20SL%20Relay.docx) Further Issues on Paging in NR Sidelink Relay Nokia, Nokia Shanghai Bell discussion Rel-17 NR\_SL\_relay-Core

[R2-2200794](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200794%20Discussion%20on%20establishment%20cause%20of%20relay%20UE.doc) Discussion on establishment cause of relay UE Xiaomi, Lenovo, Motorola Mobility, Apple discussion

[R2-2200795](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200795%20Relay%20Connection%20control.doc) Discussion on connection control Xiaomi discussion

[R2-2200796](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200796%20Relay%20Discussion%20on%20SI%20and%20short%20message%20delivery.doc) Discusson on SI delivery Xiaomi discussion

[R2-2200855](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200855%20Control%20plane%20procedure.docx) Control plane procedure CMCC discussion Rel-17 NR\_SL\_relay-Core

[R2-2200908](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200908.doc) Area specific SI issue in L2 relay Sony discussion Rel-17 NR\_SL\_relay-Core

[R2-2200946](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200946%20RAN_Sharing.docx) Discussion on RAN sharing with L2 U2N relays Nokia, Nokia Shanghai Bell discussion Rel-17 NR\_SL\_relay-Core

[R2-2201136](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2201136%20Discussion%20on%20control%20plane%20procedures%20for%20L2%20relay.doc) Discussion on remaining issues on control plane procedures Apple discussion Rel-17 NR\_SL\_relay-Core

[R2-2201144](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2201144%20(R17%20SL%20Relay%20SI_AI8721%20SI%20and%20Paging).doc) Remaining Aspects of Paging and System Information for L2 UE to NW Relays InterDigital discussion Rel-17 FS\_NR\_SL\_relay

[R2-2201145](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2201145%20(R17%20SL%20Relay%20SI_AI8721%20ConnEst%20Procedure).doc) Open Issues on Connection Establishment for UE to NW Relays InterDigital discussion Rel-17 FS\_NR\_SL\_relay

[R2-2201146](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2201146%20(R17%20SL%20Relay%20SI_AI8721%20IDLE_Mobility).doc) IDLE/INACTIVE Remote UE Behaviour during Remote and Relay UE Mobility InterDigital discussion Rel-17 FS\_NR\_SL\_relay

[R2-2201158](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2201158-%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

[R2-2201218](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Docs\R2-2201218.zip) Consideration on the remain issues for control plane procedures LG Electronics France discussion Rel-17

[R2-2201294](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2201294_SL%20Relay%20Access%20Control_Intel.docx) Access control support for U2N relaying Intel Corporation discussion Rel-17 NR\_SL\_relay-Core

[R2-2201345](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2201345%20Consideration%20on%20the%20control%20plane%20procedure%20of%20SL%20relay.doc) Consideration on the control plane procedure of SL relay ZTE, Sanechips discussion Rel-17

[R2-2201509](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2201509%20SI%20forwarding%20and%20paging%20for%20L2%20sidelink%20relay.docx) SI forwarding and paging for L2 sidelink relay Huawei, HiSilicon discussion Rel-17 NR\_SL\_relay-Core

[R2-2201510](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2201510%20RRC%20connection%20management%20for%20L2%20sidelink%20relay.docx) RRC connection management for L2 sidelink relay Huawei, HiSilicon 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 outcome of [Post116-e][604][Relay] Remaining issues on service continuity (Xiaomi)

Email discussion summary

[R2-2200009](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200009%20-%20Summary%20of%20%5bPost116-e%5d%5b604%5d%5bRelay%5d%20Remaining%20issues%20on%20service%20continuity%20(Xiaomi).docx) Summary of [Post116-e][604][Relay] Remaining issues on service continuity (Xiaomi) Xiaomi discussion

Easy proposals:

Measurement and report criteria:

Proposal 1:[Easy] S-measure criterion based on SL/SD-RSRP of serving relay during indirect to direct path switching is not introduced.

Proposal 2:[Easy]Remote UE does not consider the AS criteria for measurement report when performing SL measurement for path switch, except for configured measurement report event.

Events:

Proposal 5:[Easy]Introduce following event during indirect to direct path switch to trigger measurement report to gNB,

 Serving relay is worse than a threshold

Proposal 6:[Easy]Introduce following event during direct to indirect path switch to trigger measurement report to gNB,

 Candidate relay is better than a threshold

Relay UE ID:

Proposal 8:[Easy]Relay UE ID included in measurement report is relay UE’s source L2 ID.

Proposal 9:[Easy]Relay UE in RRC\_CONNECTED reports its source L2 ID to gNB, via SidelinkUEInformationNR.

Agreements:

Proposal 1:[Easy] S-measure criterion based on SL/SD-RSRP of serving relay during indirect to direct path switching is not introduced.

Proposal 2:[Easy]Remote UE does not consider the AS criteria for measurement report when performing SL measurement for path switch, except for configured measurement report event.

Proposal 5:[Easy]Introduce following event during indirect to direct path switch to trigger measurement report to gNB,

 Serving relay is worse than a threshold

Proposal 6:[Easy]Introduce following event during direct to indirect path switch to trigger measurement report to gNB,

 Candidate relay is better than a threshold

Proposal 8:[Easy]Relay UE ID included in measurement report is relay UE’s source L2 ID.

Proposal 9:[Easy]Relay UE in RRC\_CONNECTED reports its source L2 ID to gNB, via SidelinkUEInformationNR.

For discussion:

Allow-/block-list:

Proposal 3: RAN2 to discuss whether Allow-list and/or Block-list of relay UE during direct to indirect path switch is introduced.

Proposal 4: If Allow-list/Block-list of relay UE during direct to indirect path switch is introduced, allow-list/block-list include relay UE’s serving cell ID. FFS whether it could include relay UE ID.

Discussion:

Xiaomi confirm there was a majority for not supporting the allow-list/block-list, mainly because it is not considered critical at this stage of the WI. However, Xiaomi think the impact is limited and we could reuse the Uu design for the basic function.

OPPO, LG, and CATT prefer to go with the majority. Huawei support the lists but can accept majority view.

Cell ID:

Proposal 7: RAN2 to discuss which ID is included in measurement report as relay UE’s cell ID.

Discussion:

Xiaomi and CATT understand that there was support for NCGI if we have RAN sharing, NCI otherwise.

Autonomous reselection cases:

Proposal 10: RAN2 to discuss whether remote UE can perform autonomous relay reselection in other cases besides SL RLF, e.g. upon relay UE’s handover and relay UE’s RLF.

Discussion:

Xiaomi indicate that there was a small majority. OPPO think we could skip this proposal as it is related to the CP discussion (recommendation 4-6).

UL PDCP lossless behaviour:

Proposal 11: RAN2 to discuss which option to ensure UL PDCP lossless in indirect-to-direct path switch,

 Option 1: No spec impact, i.e., assume loss of UL PDCP PDUs is a corner case or can be addressed by network implementation,

 Option 2: Remote UE retransmits all the PDCP SDUs for which the successful delivery of the corresponding PDCP Data PDU has not been confirmed by PDCP status report in the target side after path switch.

Discussion:

Xiaomi indicate that 13 companies supported option 1 and they think we could agree to this.

Agreements:

Allow-list/block-list of relay UE during direct-to-indirect path switch is not introduced.

If RAN sharing is determined to be supported, relay UE’s cell ID included in measurement report is NCGI; otherwise it is NCI.

No spec impact for ensuring UL PDCP lossless behaviour in indirect-to-direct path switch (assume it is a corner case or can be addressed by network implementation).

* [AT116bis-e][615][Relay] Support of idle/inactive relay UE in path switch (Intel)

Scope: Discuss and attempt to converge on the possible support of a relay UE in RRC\_IDLE or RRC\_INACTIVE during direct-to-indirect path switch.

Intended outcome: Report to online session in R2-2201764

Deadline: Thursday 2022-01-20 1600 UTC

[R2-2201764](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2201764_%5bAT116bis-e%5d%5b615%5d%20Support%20of%20idle-inactive%20relay%20UE%20in%20path%20switch%20(Intel)_summary.docx) [AT116bis-e][615] Support of idle/inactive relay UE in path switch (Intel) - Summary Intel Corporation discussion Rel-17 NR\_SL\_relay-Core

* Revised in R2-2201766

[R2-2201766](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2201766_%5bAT116bis-e%5d%5b615%5d%20Support%20of%20idle-inactive%20relay%20UE%20in%20path%20switch%20(Intel)_summary.docx) [AT116bis-e][615] Support of idle/inactive relay UE in path switch (Intel) - Summary Intel Corporation discussion Rel-17 NR\_SL\_relay-Core

PROPOSAL Recommendation#1a based on almost majority (16/23): gNB cannot fetch the Relay UE context (e.g. from AMF) using the Relay UE’s source L2 ID provided in the sidelink measurement report by the Remote UE.

Discussion:

OPPO support the recommendation but think we do not need to capture it in the spec. InterDigital have the same view, and point out that the proposal seems to apply only to RRC\_IDLE.

PROPOSAL Recommendation#1b based on almost majority (16/23): gNB does not need to have the target Relay UE context with relevant Relaying authorization information available, before choosing the target Relay UE for direct to indirect path switching of the Remote UE.

PROPOSAL Recommendation#2 based on majority (17/23): Option 2 is agreed. i.e. 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.

Discussion:

Intel preferred option 1 but can accept the majority view.

Qualcomm still have some concern because they think there are technical questions not fully addressed by the email discussion. They see a time gap between the measurement report including the L2ID and the handover command, and during this interval they think the idle UE could change its L2ID unbeknownst to the gNB, or it could reselect to another cell. They do not think this is a corner case as the time gap may not be short.

vivo share Qualcomm’s concern and think there are spec impacts that have been raised. They think the direct consequence of supporting this feature would be to introduce more open issues that have to be resolved in the next meeting.

InterDigital suggest we could support RRC\_INACTIVE and leave RRC\_IDLE FFS. MediaTek agree.

Xiaomi understand the time gap issue is also applicable for the inactive relay UE.

Apple think Qualcomm’s concerns can be addressed; for example, if the ID has changed, the relay UE can report both IDs so the gNB can still find the appropriate context. For a relay UE that reselects to another cell, they think this is the same for idle and inactive. So they feel that both idle and inactive can be supported and we do not need a divergent solution.

Samsung agree with Qualcomm.

Huawei cannot accept FFS for RRC\_IDLE and feel we have to decide this meeting. To Qualcomm’s scenario, they think it is up to gNB implementation whether to hand the remote UE over to an idle/inactive relay. They suggest WA to support both.

Ericsson understand that the time gap is on the order of milliseconds, so they do not see it as a big issue. They also think the signalling already supports it and we just need support in the stage 2 for the signalling procedure through the relay UE.

Qualcomm can accept a working assumption if we add a UE capability to support handover to idle/inactive UE.

Apple would like more time to think about the capability, since an idle/inactive UE would not report its capability.

WA: 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.

WA: UE capability for support by the remote UE of handover to idle/inactive UE.

PROPOSAL Recommendation based on majority (18/23)#3: For the delivery of RRCReconfigurationComplete message by the Remote UE, default configuration which can be reconfigured by the network same as SL-RLC1 is used for PC5 RLC channel configuration to support RRC\_IDLE/INACTIVE target Relay UE for direct to indirect path switch procedure.

Discussion:

Chair suggests we agree this proposal conditional on support of the feature.

ZTE think the remote UE can be controlled by the gNB, but it should be clarified how the relay UE uses the default configuration for reception. After completion of the PC5 link setup, they understand remote and relay UE may need to communicate for activation of this default configuration. Huawei understand this is the same thing we do in RRC setup.

Ericsson are OK with the proposal but wonder why we limit only to the service continuity case, instead of applying it in general. They find it strange that we would use a default configuration for this case only, instead of a configuration that always comes from the network.

OPPO understand that in the previous agreement for SRB1, the default configuration is applied to reestablishment and resume, but we have not included this handover confirm case yet. So they see this as consistent with other cases.

Apple think in idle/inactive, only the default configuration can be used because the network does not have the opportunity to reconfigure the relay UE. Qualcomm and Samsung understand the configuration is needed at both sides.

The following documents will not be individually treated

[R2-2200167](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200167.docx) Leftover Issues on Service Continuity for L2 U2N Relay CATT discussion Rel-17 NR\_SL\_relay-Core

[R2-2200174](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200174%20-Remaining%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

[R2-2200227](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200227_SL_ServiceContinuity_Intel.docx) Remaining issues for service continuity in L2 U2N relaying Intel Corporation discussion Rel-17 NR\_SL\_relay-Core

[R2-2200333](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200333%20Remaining%20issues%20for%20service%20continuity.docx) Remaining issues for service continuity MediaTek Inc. discussion Rel-17

[R2-2200402](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200402_Further%20discussions%20on%20open%20issues%20of%20path%20switch.docx) Further discussions on open issues of path switch NEC Corporation discussion Rel-17

[R2-2200472](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200472%20Remaining%20issues%20on%20service%20continuity%20in%20L2%20U2N%20relay.docx) Remaining issues on service continuity in L2 U2N relay vivo discussion

[R2-2200488](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200488%20Discussion%20on%20remaining%20issue%20of%20service%20continuity.docx) Discussion on remaining issue of service continuity OPPO discussion Rel-17 NR\_SL\_relay-Core

[R2-2200513](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200513_Discussion%20on%20service%20continuity%20for%20L2%20UE-to-Network%20relay.docx) Discussion on service continuity for L2 UE-to-Network relay China Telecom discussion Rel-17 NR\_SL\_relay-Core

[R2-2200654](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200654%20Open%20issues%20for%20service%20continuity.doc) Open issues for service continuity Samsung discussion Rel-17 NR\_SL\_relay-Core

[R2-2200744](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200744%20Local%20remote%20UE%20ID%20allocation%20for%20direct%20to%20indirect%20path%20switching.docx) Local remote UE ID allocation for direct to indirect path switching ASUSTeK discussion Rel-17 NR\_SL\_relay-Core

[R2-2200745](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200745%20Multiple%20PDU%20sessions%20handling%20during%20direct%20to%20indirect%20path%20switching.docx) Multiple PDU sessions handling during direct to indirect path switching ASUSTeK discussion Rel-17 NR\_SL\_relay-Core

[R2-2200777](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200777%20Path%20switching%20in%20L2%20U2N%20relay%20v1.0.doc) Path switching in L2 U2N relay case Lenovo, Motorola Mobility discussion Rel-17

[R2-2200793](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200793%20Relay%20Discussion%20on%20service%20continuity.doc) Discussion on service continuity Xiaomi discussion

[R2-2200909](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200909.doc) Service continuity open issues in L2 NR sidelink relay Sony discussion Rel-17 NR\_SL\_relay-Core

[R2-2201056](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2201056_service%20cont.doc) Remaining issues for Service Continuity in L2 relay Kyocera discussion

[R2-2201137](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2201137%20Discussion%20on%20service%20continuity.doc) Discussion on remaining issues on service continuity Apple discussion Rel-17 NR\_SL\_relay-Core

[R2-2201147](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2201147%20(R17%20SL%20Relay%20SI_AI8722%20Service_Continuity).doc) Remaining Issues on Service Continuity for L2 UE to NW Relays InterDigital discussion Rel-17 FS\_NR\_SL\_relay

[R2-2201159](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2201159-%20Remaining%20Issues%20on%20service%20continuity%20for%20L2%20sidelink%20relay.docx) Remaining Issues on Service Continuity for L2 Sidelink relay Ericsson discussion Rel-17 NR\_SL\_relay-Core

[R2-2201246](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2201246%20Remaining%20issues%20on%20direct-to-indirect%20path%20switching.docx) Remaining issues on direct-to-indirect path switching Sharp discussion

[R2-2201346](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2201346%20Discussion%20on%20remaining%20issues%20on%20service%20continuity.doc) Discussion on remaining issues on service continuity ZTE, Sanechips discussion Rel-17

[R2-2201444](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Docs\R2-2201444.zip) Service continuity in direct-to-indirect path switch LG Electronics France discussion Rel-17

[R2-2201462](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2201462%20Support%20of%20idle%20mode%20mobility%20for%20remote-UE%20in%20SL%20U2N%20relay.docx) Support of idle mode mobility for remote-UE in SL UE-to-Nwk relay Nokia, Nokia Shanghai Bell discussion Rel-17 NR\_SL\_relay-Core R2-2110767

[R2-2201511](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2201511%20Remaining%20issues%20on%20service%20continuity%20for%20L2%20U2N%20Relay.docx) Remaining issues on service continuity for L2 UE to NW Relay Huawei, HiSilicon discussion Rel-17 NR\_SL\_relay-Core

#### 8.7.2.3 Adaptation layer design

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

Summary document

[R2-2200943](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200943%20-%20Summary%20of%20AI%208.7.2.3%20on%20the%20adaptation%20layer%20(Ericsson).docx) summary of AI 8.7.2.3 on the adaptation layer Ericsson discussion Rel-17 NR\_SL\_relay-Core Late

Proposal 2 (easy) The size of remote UE Uu RB ID is of 5 bits in the adaptation layer header.

Agreement:

The size of remote UE Uu RB ID is of 5 bits in the adaptation layer header.

Proposal 1 (discussion) For the size of remote UE local ID, RAN2 to down select the following options:

a. Option 1 – 5 bits

b. Option 2 - 8 bits

c. Option 3 – 10 bits

Discussion:

Ericsson understand that views are not extremely strong on this point. Huawei suggest we compromise on b. vivo are concerned about the SL BSR format for mode 1. Qualcomm agree with vivo.

ZTE think 10 bits is better for future compatibility towards multihop. For the BSR, they think the relay UE only needs to report the destination index of the connected remote UE, which does not need to be the same as the local ID.

OPPO think if there are more than 32 remote UEs they could use mode 2.

Intel point out that the Rel-16 limit on SL destinations is 32, and we are not considering multihop now (or even in Rel-18). So they see forward compatibility as not necessary.

Apple ask if the remote UE ID is allocated per relay; Ericsson think we have not answered this yet. Apple think we need a larger size if it is per gNB.

OPPO suggest we downselect to 5 and 8 and see company views.

Between 5 and 8 bits, show of hands:

5 bits: 7

8 bits: 9 (one company indicates 5 if it is per relay)

Huawei think we can extend in future releases with the R bits, but there may be mixed-release deployments and the extended UE ID would not be understood by legacy UEs.

OPPO suggest a WA for 8 bits.

Working assumption:

Remote local UE ID is 8 bits.

Proposal 4 (discussion) Regarding whether remote UE ID is present in PC5 adaptation layer header, RAN2 to down select the following options:

a. Option 1: always absent in this release

b. Option 2: always present in this release

Show of hands:

Option 1: 6

Option 2: 12

Discussion:

Huawei want to understand the motivation; they understand that other changes would be needed for multihop and this is not enough future-proofing for that. They think we should not introduce a field that is useless. Samsung, Intel, and vivo agree.

OPPO think many companies see this as necessary for future-proofing, and think other requirements like a path ID would need future discussion; we do not know that a path ID would be needed for multihop but we do know that a destination UE ID would be needed.

Ericsson think the relay UE does not need to update the SRAP header if we have option 2.

Samsung think there is no technical benefit and doubt if we can take a WA.

Xiaomi point out that there is no multihop in Rel-18 and think we need to be mindful of that. They do not see the need of the field but could accept a WA if it’s clear there is no further spec impact.

vivo think there will be extra spec impact for PC5 intrinsically and the WA violates our earlier agreement to have only bearer mapping in SRAP.

Huawei understand that we need to conclude but think the WA forces us to conclude on P6 which takes more time.

Intel think we can take the WA and revisit it if it proves impossible to agree on P6.

Working assumption:

Remote UE ID is always present in PC5 adaptation layer header. RAN2 does not pursue procedural spec impact for handling it beyond P6 of R2-2200943. To be revisited this meeting in light of any conclusion on P6.

Proposal 6 (discussion) If remote UE local ID is present in PC5 adaption layer header, RAN2 to down select the following options based on which remote UE can obtain the local ID from the gNB:

a. Option 1: via Uu RRC messages, including RRCSetup/RRCReconfiguration/RRCResume/RRCReestablishment

b. Option 2: Via SRAP header of RRCResume / RRCReestablishment

c. Option 3: relay UE forwards the local ID to remote UE via PC5 RRC message

Proposal 3 (discussion) Control PDU is not supported for the adaptation layer in this release.

Proposal 5 (discussion) Regarding how to indicate L2 ID of remote UE in the SUI message by relay UE, RAN2 to down select the following options:

a. Option 1: add a new IE to carry L2 ID of remote UE

b. Option 2: reuse the existing field sl-DestinationIdentity to request TX resources, in addition, introduce an indicator indicating that the destination ID is for relay purpose

Proposal 9 (discussion) RAN2 to discuss whether LCID for PC5 RLC channel is to be allocated by UE as in R16 or specified for Uu SRB0.

Proposal 14 (discussion) Same as in Uu, no spec impact is expected for “As in Uu, a Uu DRB and a Uu SRB are mapped to different RLC channels (i.e., PC5 RLC channel and Uu RLC channel)”.

Discussion:

Huawei understand that there should be some guidance for the gNB to prevent this mapping from being done wrongly; think we could discuss in running CR.

vivo agree with Huawei and think it can be left for the running CR. OPPO, Qualcomm, and Samsung agree.

* [AT116bis-e][619][Relay] Remaining proposals on adaptation layer (Ericsson)

Scope: Discuss the remaining proposals from R2-2200943: P6/P3/P9.

Intended outcome: Report to CB session

Deadline: Monday 2022-01-24 1800 UTC

The following documents will not be individually treated

[R2-2200168](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200168.docx) Leftover Issues on Adaptation Layer Design for L2 U2N Relay CATT discussion Rel-17 NR\_SL\_relay-Core

[R2-2200175](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200175%20-%20Remaining%20issues%20on%20adaptation%20layer%20of%20L2%20U2N%20relay.doc) Remaining issues on adaptation layer of L2 U2N relay Qualcomm Incorporated discussion NR\_SL\_relay-Core

[R2-2200228](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200228_SL_AdaptationLayer_Intel.docx) Open aspects of adaptation layer design for L2 U2N relaying Intel Corporation discussion Rel-17 NR\_SL\_relay-Core

[R2-2200335](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200335%20Remaining%20issues%20for%20Adaptation%20layer%20design%20v02.docx) Remaining issues for Adaptation layer design MediaTek Inc. discussion Rel-17

[R2-2200363](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200363%20-%20Left%20issues%20for%20adaptation%20layer.docx) Left issues for adaptation layer OPPO discussion Rel-17 NR\_SL\_relay-Core

[R2-2200473](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200473%20Adaptation%20Layer%20for%20Uu%20and%20PC5.docx) Adaptation Layer for Uu and PC5 vivo discussion

[R2-2200556](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200556%20SRAP%20layer%20open%20issues%20for%20L2%20U2N%20relay.docx) SRAP layer open issues for L2 U2N relay Huawei, HiSilicon discussion Rel-17 NR\_SL\_relay-Core

[R2-2200567](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200567%20Remaining%20issues%20on%20SRAP.doc) Remaining issues related to SRAP Fujitsu discussion Rel-17 NR\_SL\_relay-Core

[R2-2200655](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200655%20Flow%20control%20for%20L2%20U2N%20relay.doc) Flow control for L2 U2N Relay Samsung, Philips discussion Rel-17 NR\_SL\_relay-Core R2-2110451

[R2-2200856](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200856%20Leftover%20issues%20on%20adaption%20layer%20design.docx) Leftover issues on adaption layer design CMCC discussion Rel-17 NR\_SL\_relay-Core

[R2-2200937](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200937%20-%20Remaining%20issues%20of%20the%20adaptation%20layer.docx) Remaining issues of the adaptation layer Ericsson discussion Rel-17 NR\_SL\_relay-Core

[R2-2201347](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2201347%20Discussion%20on%20adaptation%20layer%20design.doc) Discussion on adaptation layer design ZTE, Sanechips discussion Rel-17

[R2-2201465](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2201465%20Remote%20ID%20for%20the%20adaptation%20layer.docx) Remote ID for the adaptation layer Nokia, Nokia Shanghai Bell discussion NR\_SL\_relay-Core

[R2-2201492](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2201492%20Remote%20UE%20local%20ID.docx) Remote UE local ID in PC5 Adaptation Layer Header Beijing Xiaomi Mobile Software discussion Rel-17

[R2-2201533](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2201533%20Finalizing%20design%20of%20Adapt%20layer_v2.doc) Finalizing design of Adapt layer Samsung Electronics GmbH discussion

#### 8.7.2.4 QoS

Mechanisms for E2E QoS management. This AI will not be treated online. Critical issues, if any, may be handled by email. This agenda item will utilise a summary document.

Summary document

[R2-2201659](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2201659%20Summary%20of%20agenda%20item%208.7.2.4%20(QoS).doc) Summary of agenda item 8.7.2.4 (QoS) Samsung discussion Rel-17 NR\_SL\_relay-Core

The following documents will not be individually treated

[R2-2200169](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200169.docx) Leftover Issues on QoS Management for L2 U2N Relay CATT discussion Rel-17 NR\_SL\_relay-Core

[R2-2200334](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200334%20Remaining%20issues%20for%20QoS.docx) Remaining issues for QoS MediaTek Inc. discussion Rel-17

[R2-2200413](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200413_Considerations%20on%20voice%20and%20video%20support%20for%20Relays.docx) Considerations on voice and video support for Relays Philips International B.V., MediaTek, Vivo, FirstNet, KPN, TNO, Kyocera discussion Rel-17 NR\_SL\_relay-Core R2-2109822

[R2-2200474](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200474_E2E%20QoS.docx) Left issues on E2E QoS management vivo discussion

[R2-2200656](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200656%20QoS%20handling%20for%20SL%20discovery.doc) QoS handling for SL discovery Samsung discussion Rel-17 NR\_SL\_relay-Core

[R2-2200936](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200936%20-%20Aspects%20for%20QoS%20management%20with%20SL%20relay.docx) Aspects for QoS management with SL relay Ericsson discussion Rel-17 NR\_SL\_relay-Core

[R2-2200995](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200995-%20Remaining%20Issues%20in%20QoS%20for%20L2%20Sidelink%20Relay.docx) Remaining Issues in QoS for L2 Sidelink Relay Fraunhofer IIS, Fraunhofer HHI discussion Rel-17

[R2-2201148](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2201148%20(R17%20SL%20Relay%20WI_AI8724%20QoS)%20.doc) Discussion on QoS for L2 UE to NW Relays InterDigital, Philips, Apple discussion Rel-17 FS\_NR\_SL\_relay

R2-2201199 Remaining issues on QoS Huawei, HiSilicon discussion Rel-17 NR\_SL\_relay-Core Withdrawn

[R2-2201348](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2201348%20Discussion%20on%20QoS%20of%20SL%20relay.doc) Discussion on QoS of SL relay ZTE, Sanechips discussion Rel-17

### 8.7.3 L2/L3 common topics

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

#### 8.7.3.1 Discovery

Including 5G ProSe Direct Discovery for the non-relaying case. Re-using LTE discovery as baseline. This agenda item may utilise a summary document (decision to be made based on submitted tdocs).

* [AT116bis-e][609][Relay] Open issues on discovery (InterDigital)

Scope: Start discussion of the inputs on discovery from AI 8.7.3.1 with focus on the open issues identified by the rapporteur in R2-2200365, and converge where possible.

Intended outcome: Report to Thursday online session in R2-2101763

Deadline: Wednesday 2022-01-19 1800 UTC

Email discussion summary

[R2-2201763](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2201763%20-%20summary%20of%20%5b609%5d_Discovery_final_Rapp.doc) Summary of [AT116bis-e][609][Relay] Open Issues on Discovery (InterDigital) InterDigital discussion Rel-17 FS\_NR\_SL\_relay

Easy Agreements:

Multiplexing/LCP impacts:

Proposal 2.1: [17/19] RAN2 assumes that discovery and data transmitted by a UE cannot be multiplexed into the same TB because they are always associated to different destination L2 IDs. RAN2 sends this assumption in an LS to SA2.

Proposal 2.2: [18/19] For SL LCP procedure, only L2 destination IDs associated to discovery can be selected for grants from the dedicated discovery resource pool.

Proposal 2.3: [19/20] For SL LCP procedure, when the dedicated discovery pool is configured, only L2 destination IDs associated to communication can be selected for grants from the shared resource pool. When the dedicated resource pool is not configured, this restriction is not applied.

Discussion:

InterDigital indicate a comment was received suggesting in 2.3 to replace “configured” with “configured/used”, to address interaction with P1.1.

ZTE wonder if P2.3 could apply to both mode 1 and mode 2 UEs, because for mode 1 we have left it to the gNB to determine which pool the UE uses if both are configured. OPPO and Qualcomm understand that it should apply for both modes, and Qualcomm understand that the previous agreement for mode 1 is outdated. CATT and Xiaomi also think it should apply to both modes. Lenovo have the same understanding.

Ericsson have a concern about 2.1 for the relay discovery case; they understand that use of different destination L2IDs for this case is not clear from SA2 side. vivo think in the SA2 TS they indicate that the L2IDs are different for communication and discovery, but when the UE has a self-assigned L2ID the IDs could be the same; they can accept to send an LS to SA2 with this assumption. InterDigital understand that the SA2 conclusion applies to both, but think sending the LS to SA2 gives them the opportunity to correct us if we have something wrong. Apple consider that for relay discovery, there is no case where the IDs are the same, but for non-relay discovery on model B it is possible because of self-assigned ID.

BSR:

Proposal 3.1: [19/19] The UE reports buffer status associated with discovery using the destination index associated to a discovery L2 ID (i.e. no impact to SL BSR MAC CE, or specific LCG ID is needed).

SUI:

Proposal 3.2: [19/20] SUI includes an indication of whether a particular destination L2 ID is associated to discovery.

Indications in SIB12:

Proposal 4.1: [18/19] Whether gNB can support relay/non-relay discovery is indicated in SIB12. Details are discussed as part of stage 3 CR drafting.

Proposal 4.2: Whether SIB12 signalling can differentiate between support of relay vs non-relay discovery is discussed as part of stage 3 CR drafting.

Proposal 4.3: [18/19] Whether gNB supports L2 relay is explicitly indicated in SIB12.

Proposal 4.5: [18/19] No additional indication in SIB12 is required to signal that operation as a L3 relay is not allowed.

Discussion:

ZTE understood initially that P4.1 referred to separate indications for L2 relay, L3 relay, and non-relay discovery cases, which they think is not necessary.

Apple have a similar understanding as ZTE and think we should agree to the high-level principle of which cases should be distinguished.

InterDigital indicate that the intent of P4.1 is not to indicate an explicit bit for discovery, but rather than the UE can determine from SIB12 that discovery is supported, with the details intended to be left to stage 3.

OPPO think non-relay discovery should be indicated explicitly. InterDigital indicate that one possibility would be a bit in SIB12 for discovery and a bit for relay support, which would implicitly say whether the discovery support meant relay or non-relay.

ZTE think on 4.5 that in the SI phase, we discussed the scenario that the gNB does not support both L2 and L3 relay and does not broadcast an indication of support, but L3 relaying operation is allowed. To distinguish from this case, they think it should be possible to indicate operation as an L3 relay is not allowed. Qualcomm think there was a clear majority.

HARQ:

Proposal 5.1: [20/20] HARQ feedback is not supported for SL discovery transmission.

Agreements:

Proposal 2.1: [17/19] RAN2 assumes that discovery and data transmitted by a UE cannot be multiplexed into the same TB because they are always associated to different destination L2 IDs. RAN2 sends this assumption in an LS to SA2.

Proposal 2.2: [18/19] For SL LCP procedure, only L2 destination IDs associated to discovery can be selected for grants from the dedicated discovery resource pool.

Proposal 2.3 (modified): [19/20] For SL LCP procedure, when the dedicated discovery pool is configured/used, only L2 destination IDs associated to communication can be selected for grants from the shared resource pool. When the dedicated resource pool is not configured/used, this restriction is not applied.

Proposal 3.1: [19/19] The UE reports buffer status associated with discovery using the destination index associated to a discovery L2 ID (i.e. no impact to SL BSR MAC CE, or specific LCG ID is needed).

Proposal 3.2: [19/20] SUI includes an indication of whether a particular destination L2 ID is associated to discovery.

The UE can determine from SIB12 whether the gNB supports relay discovery and/or non-relay discovery. Details (including whether SIB12 signalling can differentiate between support of relay vs. non-relay discovery and whether the support is indicated explicitly or implicitly) can be discussed as part of stage 3 CR drafting.

Proposal 4.3: [18/19] Whether gNB supports L2 relay is explicitly indicated in SIB12.

Proposal 4.5: [18/19] No additional indication in SIB12 is required to signal that operation as a L3 relay is not allowed.

Proposal 5.1: [20/20] HARQ feedback is not supported for SL discovery transmission.

Agreements requiring more discussion in RAN2

Proposal 1.1: [12/18] The use of both dedicated and shared resource pools for discovery transmission, when both pools have been configured, is not supported in this release.

Proposal 4.4: RAN2 discusses whether SIB12:

a) signals L3 relaying support implicitly by indicating the support of discovery [11/19]

b) signals support of L3 relaying independently from support of discovery [8/19]

Discussion:

OPPO think from the capability perspective, there is no additional capability for L3 relaying besides discovery. However, they think it is conceivable that the network wants to forbid L3 relay operation.

vivo think since we already agreed to postpone the relay/non-relay discovery distinction to stage 3, we could do the same with this.

Huawei prefer option b and think we need to make the decision at this meeting. They see cases where the gNB may connect to a CN that does not support L3 relaying.

Qualcomm support option a and think that the network capability is related to whether the gNB prefers to disable L3 relay; even if this indication is introduced, the gNB cannot detect that a UE is operating as a L3 relay.

Apple agree with Qualcomm and think option a is more straightforward. They see no need for the network to disable L3 relaying.

Ericsson think from a configurability point of view, option b is preferable and gives more flexibility to the network. They could accept leaving the final decision to stage 3.

ZTE also prefer option b.

LG agree with Apple and Qualcomm; CATT think option a is adequate.

Qualcomm have a strong concern with option b because they think the UE behaviour is not clearly specified in case there is CN support but the gNB forbids it.

Apple understand that L3 relay is not allowed if the network does not provide discovery configuration, and it seems strange if the network allows discovery but not L3 relay.

Huawei understand that we would not specify a UE behaviour for the case described by Qualcomm, but we could specify the signalling.

Agreements:

Proposal 1.1: [12/18] The use of both dedicated and shared resource pools for discovery transmission, when both pools have been configured, is not supported in this release.

Whether L3 relaying support is signalled implicitly by indicating the support of discovery, or signalled independently from support of discovery, can be discussed in stage 3 drafting.

* [AT116bis-e][620][Relay] LS to SA2 on discovery and data associated to different L2IDs (vivo)

Scope: Draft an LS to SA2 indicating the assumption from proposal 2.1 of R2-2101763.

Intended outcome: Approved LS (with no CB if possible)

Deadline: Monday 2022-01-24 1800 UTC

[R2-2200170](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200170.docx) Leftover Issues for Sidelink Discovery CATT discussion Rel-17 NR\_SL\_relay-Core

[R2-2200176](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200176%20-%20Remaining%20issues%20on%20discovery.doc) Remaining issues on discovery Qualcomm Incorporated discussion NR\_SL\_relay-Core

[R2-2200229](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200229_SL_discovery_Intel.docx) Discovery open aspects for U2N relaying Intel Corporation discussion Rel-17 NR\_SL\_relay-Core

[R2-2200411](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200411%20Relay%20Discovery%20in%20L2%20and%20L3%20relay%20case.doc) Relay Discovery in L2 and L3 relay case Lenovo, Motorola Mobility discussion NR\_SL\_relay-Core

[R2-2200475](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200475_Remaining%20Issues%20of%20Discovery%20Message%20Transmission.docx) Remaining Issues of Discovery Message Transmission vivo discussion

[R2-2200486](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200486%20Discussion%20on%20remaining%20issue%20of%20sidelink%20discovery.docx) Discussion on remaining issue of sidelink discovery OPPO discussion Rel-17 NR\_SL\_relay-Core

[R2-2200514](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200514%20Discussion%20on%20SL%20discovery%20remaining%20issues.docx) Discussion on SL discovery remaining issues China Telecom discussion Rel-17 NR\_SL\_relay-Core

[R2-2200657](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200657%20PDCP%20and%20RLC%20aspects%20for%20SL%20discovery.doc) PDCP and RLC aspects for SL discovery Samsung discussion Rel-17 NR\_SL\_relay-Core

[R2-2200934](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200934%20-%20Left%20issues%20for%20SL%20discovery.docx) Left issues for SL discovery Ericsson discussion Rel-17 NR\_SL\_relay-Core

[R2-2201138](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2201138%20Discussion%20on%20remaining%20issues%20on%20relay%20discovery.doc) Discussion on remaining issues on relay discovery Apple discussion Rel-17 NR\_SL\_relay-Core

[R2-2201149](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2201149%20(R17%20SL%20Relay%20WI_AI8731%20Discovery).doc) Using Shared and Dedicated Resource Pools for Discovery InterDigital discussion Rel-17 FS\_NR\_SL\_relay

[R2-2201343](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2201343%20Further%20discussion%20on%20relay%20discovery.doc) Further discussion on Relay discovery ZTE, Sanechips discussion Rel-17

[R2-2201491](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2201491%20Tx%20Resources%20for%20Discovery.docx) Tx Resource Pools for Discovery Beijing Xiaomi Mobile Software discussion Rel-17

[R2-2201512](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2201512%20Remaining%20issues%20on%20relay%20discovery.docx) Remaining issues on relay discovery Huawei, HiSilicon discussion Rel-17 NR\_SL\_relay-Core

#### 8.7.3.2 Relay re selection

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

[R2-2200177](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200177%20-%20Remaining%20issues%20on%20relay%20(re)selection.doc) Remaining issues on relay (re)selection Qualcomm Incorporated discussion NR\_SL\_relay-Core

PC5-RRC notification message:

Proposal 5: Upon reception of the PC5 RRC message for notification, it is up to remote UE implementation whether to release or keep the unicast PC5 link. And if remote UE decides to release the unicast PC5 link, it triggers the legacy L2 release procedure and performs relay reselection.

Proposal 6: For remote UE to make decision on whether to trigger relay (re)selection, the PC5-RRC notification message sent by relay UE includes the cause value, i.e., HO or cell (re)selection or Uu RLF.

Proposal 7: RAN2 confirm that the PC5-RRC message for notification is applied to both L2 and L3 relay.

Discussion:

OPPO share the intention of the proposal but think P5 should say “when” rather than “whether” to release or keep the link. They understand that it needs to release the link to avoid a situation where it later has two links at the same time. Qualcomm think it is possible that the relay UE recovers its Uu link, but their intention is that the remote UE could wait to see if the link is recovered, and if so there is no need to release the link. Ericsson, InterDigital, and vivo agree with Qualcomm.

Intel wonder if the remote UE does not take the decision to perform reselection, what happens to paging; it seems paging will be missed. So they think remote UE behaviour should be defined rather than left purely to implementation, e.g. a limit on the time.

Huawei think it should be left to remote UE implementation, because the remote UE may not be able to select any other relay UE (e.g. a watch that is bonded to one specific phone for relaying). In this case paging would be missed.

Qualcomm think Intel’s scenario can be handled by PC5-S signalling. If the Uu is lost the relay UE will send PC5-S release.

Intel understand that PC5-S is controlled by upper layers and we do not know the delay, but they can accept the set of agreements.

vivo are not OK with P2, because the assumption is that the decision would be with the remote UE and having P2 puts the control with the relay UE. They think we could take P5 now and discuss P2.

Agreements:

Proposal 5: Upon reception of the PC5 RRC message for notification, it is up to remote UE implementation whether to release or keep the unicast PC5 link. And if remote UE decides to release the unicast PC5 link, it triggers the legacy L2 release procedure and performs relay reselection.

Proposal 6: For remote UE to make decision on whether to trigger relay (re)selection, the PC5-RRC notification message sent by relay UE includes the cause value, i.e., HO or cell (re)selection or Uu RLF.

Proposal 7: RAN2 confirm that the PC5-RRC message for notification is applied to both L2 and L3 relay.

PC5-S notification message:

Proposal 2: RAN2 confirm that the agreed “PC5-S message (similar to LTE)” is the Disconnect Request message as captured in Section 6.3.3.3 of TS 23.287. Upon reception of the PC5-S message, remote UE releases the unicast PC5 link and performs relay reselection.

Proposal 3: No need to include the cause value in the “PC5-S message (similar to LTE)”. And it is up to relay UE implementation when to send PC5-S message, e.g., Uu RLF

Proposal 4: RAN2 confirm that the agreed “PC5-S message (similar to LTE)” is applied to both L2 and L3 relay.

[R2-2200422](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200422_U2N%20Relay%20UE%20operation%20Threshold%20Conditions%20-%20Impact%20of%20UE%20mobility.docx) U2N Relay UE operation Threshold Conditions: Impact of UE Mobility Philips International B.V., FirstNet, MediaTek, Lenovo, Motorola Mobility discussion Rel-17 NR\_SL\_relay-Core R2-2109823

Proposal 1: The mobility of the U2N Relay UE should be taken into account in the RSRP thresholds that determine whether the U2N Relay UE can send relay discovery messages.

Proposal 2: The parameters hystMinRelay / hystMaxRelay, used in U2N Relay UE operation threshold conditions, can be adapted to consider the mobility state of the U2N Relay UE by using a scaling factor (similar to q-hystSF in NR).

Proposal 3: It is proposed to modify the running CR for TS 38.331 based on section 2.5 of contribution R2- 2109823.

[R2-2200171](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200171.docx) Leftover Issues for Relay Reselection CATT discussion Rel-17 NR\_SL\_relay-Core

[R2-2200476](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200476_Remaining%20Issues%20on%20Relay%20(re)selection.docx) Remaining issues on Relay (re)selection vivo discussion

[R2-2200487](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200487%20Discussion%20on%20remaining%20issue%20of%20relay%20reselection.docx) Discussion on remaining issues of NR sidelink relay (re)selection OPPO discussion Rel-17 NR\_SL\_relay-Core

[R2-2200626](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200626.doc) Left issues on NotificationMessageSidelink message Spreadtrum Communications discussion Rel-17

[R2-2200778](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200778%20Relay%20(re)selection%20in%20L2%20and%20L3%20relay%20case%20v1.0.doc) Relay (re)selection for L2 and L3 relay Lenovo, Motorola Mobility discussion Rel-17

[R2-2200935](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200935%20-%20Aspects%20for%20SL%20relay%20selection%20and%20reselection.docx) Aspects for SL relay selection and reselection Ericsson discussion Rel-17 NR\_SL\_relay-Core

[R2-2201198](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2201198.docx) Discussion on relay reselection aspects Huawei, HiSilicon discussion Rel-17 NR\_SL\_relay-Core

[R2-2201344](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2201344%20Further%20discussion%20on%20relay%20selection.doc) Further discussion on Relay selection ZTE, Sanechips discussion Rel-17

## 8.11 NR positioning enhancements

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

Time budget: 2 TU

Tdoc Limitation: 7 tdocs

Email max expectation: 7 threads

### 8.11.1 Organizational

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

Open issue list and work planning (including UE capabilities)

[R2-2200285](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200285%20Open%20issue%20lists%20on%20Rel-17%20positioning%20WI.docx) Open issue lists on Rel-17 positioning WI Intel Corporation discussion Rel-17 NR\_pos\_enh-Core

* Noted (email discussion [AT116bis-e][600])

[R2-2200284](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200284%20Rel-17%20positioning%20capabilities.docx) Rel-17 positioning capabilities Intel Corporation discussion Rel-17 NR\_pos\_enh-Core

* Noted (email discussion [AT116bis-e][600])

Incoming LS with RAN2 in Cc:

[R2-2200113](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200113_R3-216235.docx) Reply LS on location estimates in local co-ordinates (R3-216235; contact: Huawei) RAN3 LS in Rel-17 5G\_eLCS\_ph2 To:RAN1, SA2 Cc:RAN2

* Noted (email discussion [AT116bis-e][600])

Incoming LSs with “take into account” action

[R2-2200074](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200074_R1-2112784.docx) LS on latency improvement for PRS measurement with MG (R1-2112784; contact: Huawei) RAN1 LS in Rel-17 NR\_pos\_enh To:RAN2, RAN3

* Noted (email discussion [AT116bis-e][600])

[R2-2200082](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200082_R1-2112844.docx) LS on TRP beam/antenna information (R1-2112844; contact: Ericsson) RAN1 LS in Rel-17 NR\_pos\_enh To:RAN2, RAN3

* Noted (email discussion [AT116bis-e][600])

[R2-2200083](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200083_R1-2112846.docx) LS on configuration and transmission of SRS for positioning in RRC\_INACTIVE state (R1-2112846; contact: Intel) RAN1 LS in Rel-17 NR\_pos\_enh-Core To:RAN2

* Noted (email discussion [AT116bis-e][600])

[R2-2200089](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200089_R1-2112881.docx) LS on PRS processing window (R1-2112881; contact: Huawei) RAN1 LS in Rel-17 NR\_pos\_enh To:RAN2, RAN3

* Noted (email discussion [AT116bis-e][600])

[R2-2200092](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200092_R1-2112968.docx) LS on the reporting of the Tx TEG association information (R1-2112968; contact: CATT) RAN1 LS in Rel-17 NR\_pos\_enh-Core To:RAN2, RAN4 Cc:RAN3

* Noted (email discussion [AT116bis-e][600])

[R2-2200139](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200139_S2-2109104.docx) Reply LS on Response LS on Positioning Reference Units (PRUs) for enhancing positioning performance (S2-2109104; contact: Huawei) SA2 LS in Rel-17 NR\_pos\_enh-Core To:RAN2 Cc:RAN1, RAN3

* Noted (email discussion [AT116bis-e][600])

[R2-2200140](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200140_S2-2109105.docx) Response LS on Positioning Reference Units (PRUs) for enhancing positioning performance (S2-2109105; contact: CATT) SA2 LS in Rel-17 5G\_eLCS\_ph2 To:RAN1, RAN2 Cc:RAN3

* Noted (email discussion [AT116bis-e][600])
* All above LSs to be considered in the discussion of the corresponding agenda items

Draft replies

[R2-2200302](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200302%20Reply%20LS%20on%20the%20Response%20LS%20on%20Positioning%20Reference%20Units%20(PRUs)%20for%20enhancing%20positioning%20performance.docx) [Draft]Reply LS on the Response LS on Positioning Reference Units (PRUs) for enhancing positioning performance CATT LS out Rel-17 NR\_pos\_enh-Core To:SA2 Cc:RAN1, RAN3

* Noted (email discussion [AT116bis-e][600])
* To be considered in the discussion of PRUs ([AT116bis-e][614])

Draft replies not from LS contact company

[R2-2200523](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200523%20%5bDraft%5d%20Response%20LS%20on%20the%20latency%20improvement%20for%20PRS%20measurement%20with%20MG.docx) [Draft] Response LS on the latency improvement for PRS measurement with MG ZTE LS out To:RAN1 Cc:RAN3

* Noted (email discussion [AT116bis-e][600])

[R2-2200524](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200524%20%5bDraft%5d%20Response%20LS%20on%20the%20PRS%20processing%20window.docx) [Draft] Response LS on the PRS processing window ZTE LS out To:RAN1 Cc:RAN3

* Noted (email discussion [AT116bis-e][600])

[R2-2200525](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200525%20%5bDraft%5d%20Response%20LS%20on%20the%20reporting%20of%20the%20Tx%20TEG%20association%20information.docx) [Draft] Response LS on the reporting of the Tx TEG association information ZTE LS out To:RAN1 Cc:RAN3,RAN4

* Noted (email discussion [AT116bis-e][600])

[R2-2200526](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200526%20%5bDraft%5d%20Response%20LS%20on%20the%20TRP%20beam%20antenna%20information.docx) [Draft] Response LS on the TRP beam antenna information ZTE LS out To:RAN1 Cc:RAN3

* Noted (email discussion [AT116bis-e][600])
* Concerns from the above draft LSs can be raised in the corresponding technical discussions

Running CRs

[R2-2200282](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200282-Running%2038.305.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

* Noted (email discussion [AT116bis-e][600])

[R2-2200431](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200431%20Running%20MAC%20CR%20for%20R17%20Positioning.docx) Draft running CR for MAC spec in R17 positioning Huawei, HiSilicon draftCR Rel-17 38.321 16.7.0 B NR\_pos\_enh-Core

* Noted (email discussion [AT116bis-e][600])

[R2-2200432](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200432%20Draft%20running%20CR%20for%20LTE%20RRC%20spec%20for%20GNSS%20integrity%20in%20R17%20positioning.docx) Draft running CR for LTE RRC spec for GNSS integrity in R17 positioning Huawei, HiSilicon draftCR Rel-17 36.331 16.7.0 B NR\_pos\_enh-Core

* Noted (email discussion [AT116bis-e][600])

[R2-2200959](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200959_(37355%20running%20CR)_v1.docx) Running LPP CR for NR positioning enhancements Qualcomm Incorporated draftCR Rel-17 37.355 16.7.0 B NR\_pos\_enh

* Noted (email discussion [AT116bis-e][600])

[R2-2201390](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2201390_(Running%20CR%20of%2036_305%20GNSS%20Pos%20Integrity).docx) Running CR of 36.305 for GNSS Positioning Integrity InterDigital, Inc. draftCR Rel-17 36.305 16.4.0 B NR\_pos\_enh-Core

* Noted (email discussion [AT116bis-e][600])

[R2-2201391](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2201391_(Running%20CR%20of%2038_305%20GNSS%20Pos%20Integrity).docx) Running CR of 38.305 for GNSS Positioning Integrity InterDigital, Inc. draftCR Rel-17 38.305 16.7.0 B NR\_pos\_enh-Core

* Noted (email discussion [AT116bis-e][600])
* Above CRs to be updated and endorsed by post-meeting discussion
* [AT116bis-e][610][POS] Positioning UE capabilities (Intel)

Scope: Start discussion of UE capabilities for positioning, with R2-2200284 as an initial input, and attempt to conclude on a baseline set of capabilities to be reflected in 38.331/38.306 and 37.355.

Intended outcome: Report to Monday CB session in R2-2201767

Deadline: Friday 2022-01-21 1600 UTC

[R2-2201767](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2201767_Summary%20of%20offline%20610-v11_Summary.docx) Report of offline discussion [AT116bis-e][610][POS] Positioning UE capabilities (Intel) Intel Corporation discussion Rel-17 NR\_pos\_enh-Core

Easy agreements:

Proposal 3.1-1: [Easy agreements] [10/10] Confirms the following principle on how to handle positioning capability:

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

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

- RAN2 determined UE capabilities should be maintained in running UE capability CRs. RRC/TS38.306 should be merged into the Mega CRs and LPP should be merged into LPP running CR;

- Include an annex containing the RAN2 determined UE capabilities in the feature list format in the running UE capability CRs (similar to annex containing RAN2 agreements) for easy compilation into the TR38.822 in the later stage.

Proposal 3.1-2: [Easy agreements] [8/10] RAN2 leads the discussion on positioning capability for RAN2 led items “Latency reduction( scheduled location time, storing UE capability in the AMF and preconfigured AD)”, “On-Demand PRS”, “positioning in RRC\_INACTIVE” and “GNSS integrity”. RAN1 and RAN4 may provide inputs on L1 related capabilities.

Proposal 3.2.1.2-1: [Easy agreements] [8/9] For storing LPP capability in the AMF, do not introduce “variability indicator ” in LPP capability.

Proposal 3.2.1.3-1: [Easy agreements] [10/10] Include the capability to support preconfigured assistance data in each method ProvideCapabilities message, where “method” can be any of the LPP positioning methods. FFS on the granularity, e.g. whether add validity area.

Proposal 3.2.3-1: [Easy agreements] [10/10] For On-Demand PRS, introduce LPP capability on UE-initiated On-Demand PRS Request;

Discussion:

Intel indicate that P3.1-1 is already reflected in the LPP running CR. They think P3.1-2 does not need to be discussed. They think P3.2.1.3-1 should refer only to the methods involving DL-PRS.

Huawei think since the UE can change the LPP capability, the stored capability feature is not useful without this indicator. CATT think it can be indicated between LMF and AMF, but Huawei are not sure then how the LMF knows. Qualcomm agree with Huawei but see no way to fix it in this release.

ZTE wonder about 3.2.1.3-1; does preconfigured assistance data need to include support of the validity area, and if not, what does it encompass?

Qualcomm are unsure what capability we would capture for preconfigured assistance data; the validity area is agreed, but they are not sure if we need a capability for preconfigured assistance data or for a validity area (resp. other validity criteria if we agree them).

Huawei can accept no validity indicator for this release.

Intel think P3.2.1.3-1 is acceptably captured in the current LPP running CR, and we have the separate discussion on other validity criteria.

Agreements:

Proposal 3.2.1.2-1: [Easy agreements] [8/9] For storing LPP capability in the AMF, do not introduce “variability indicator ” in LPP capability.

Proposal 3.2.1.3-1 (modified): [Easy agreements] [10/10] Include the capability to support validity area in each method ProvideCapabilities message, where “method” can be any of the LPP positioning methods that rely on DL-PRS. FFS on other validity criteria.

Proposal 3.2.3-1: [Easy agreements] [10/10] For On-Demand PRS, introduce LPP capability on UE-initiated On-Demand PRS Request;

Online discussion:

Proposal 3.2.3-2: [Online discussion] [7/10] The capability “UE-initiated On-Demand PRS Request” is put under each PRS related positioning method (DL-AoD, DL-TDOA, Multi-RTT). If the UE supports it, the UE shall indicate it for all supported PRS related positioning methods (DL-AoD, DL-TDOA, Multi-RTT).

Proposal 3.2.4-1: [Online discussion] Follow RAN2 agreements “RRC state is transparent to LMF and no different handling on PRS for different RRC state”, RAN2 should avoid to optimize these aspects even if RAN1 agrees to introduce RRC\_INACTIVE specific LPP capabilities (27-6, 27-16, 27-17, 27-18a, 27-18b, 27-18c, 27-19).

Postpone:

Proposal 3.2.2-1: [Postpone]Postpone the capability discussion on GNSS integrity , wait for the outcome from GNSS integrity discussion.

Proposal 3.2.4-2: [postpone] Wait for RAN1 decision on whether UL related RRC\_INACTIVE specific capabilities (27-15, 27-16, 27-19) should be captured in RRC or LPP.

### 8.11.2 Latency enhancements

Enhancements of signalling, and procedures for improving positioning latency of the Rel-16 NR positioning methods, for DL and DL+UL positioning methods. Including scheduled location time, preconfigured assistance data, UE capability storage, measurement gap and PRS priority; any other topics will be treated at lower priority. This agenda item will utilise a summary document.

Summary document

[R2-2201652](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2201652_(Summary%20Latency%20Reduction)_v2.docx) Summary on agenda item 8.11.2 on Latency Enhancements Qualcomm Incorporated discussion Rel-17 NR\_pos\_enh-Core

Scheduled Location Time:

Proposal 1a: Include a "Scheduled Location Time" with measurement time window in LPP CommonIEsRequestLocationInformation, defining the desired time when the location measurements or location estimate is to be obtained/valid.

Proposal 1b: The time base for the scheduled location time T should support UTC Time, GNSS Time, LTE/NR Network Time, and Relative Time.

Proposal 1c: The Measurement Time Window might be asymmetric – instead of being T-t to T+t, might be T-t1 to T+t2.

Proposal 1d: Include the capability to support scheduled location in each method-ProvideCapabilites message, where 'method' can be any of the LPP positioning methods. The capability should indicate the time base(s) supported for scheduling location measurements.

Proposal 1e: The "response time" can be carried in the following messages:

- LPP capability request

- NRPPa positioning information request

- NRPPa positioning activation request

Discussion:

vivo are OK with P1a/P1b but do not prefer P1c and think no measurement window is needed. Qualcomm understand that the window should tell the UE in what window the measurement should be made, and the proposal matches what is in LPPe.

Qualcomm think P1e is not quite of a piece with the other proposals and are not sure why the response time would be in the capability signalling.

ZTE think the response time is already adequate to define when the UE should report, and if the scheduled location time is known to the LMF it can schedule the response time properly. However, they can accept the scheduled location time if the majority want it.

OPPO agree with vivo that P1c is not needed and think it has not been discussed before. They think the function of the scheduled location time is OK but the window is not needed.

Nokia agree with P1a; for P1b, they think we could simplify to one solution instead of having multiple time reference options. On P1e, they are not sure why the response time needs to be signalled in the capability.

Intel indicate SA2 agreed to provide the location time to allow the UE to enter CM\_CONNECTED; they do not see a requirement to have a window or to make it per-method. Qualcomm think the support may be different per method, e.g. not supporting the scheduled time for E-CID where available measurements are reported. This is also why they propose different time references, because different methods use different time.

Ericsson think the need for the feature is unclear and it could be done in the LCS layer.

Xiaomi wonder how the UE will schedule the measurement if a gap is needed, since the gNB controls the gap timing. On P1e, they think if the response time is included, the preparation phase can be completed in advance.

Lenovo ask if the scheduled time is carried with RequestLocationInformation, can the same effect be achieved with a shorter responseTime? They also wonder if P1a considers only the first positioning fix or also subsequent fixes.

Intel think these questions are related to how the UE uses the scheduled time; they understand that is a reference for when the UE would enter connected mode, not when it would do the measurement. They would prefer that we just follow SA2 guidance and leave to UE implementation how to use it.

Qualcomm think the UE can trigger a gap request when it needs it, and for the periodic fixes raised by Lenovo, they understand that the time applies to the first fix and the rest follow with the configured periodicity. On the comment from Intel, they understand that the position fix should be valid at the scheduled location time, so the UE should do everything possible to ensure this including scheduling measurements as well as transition to connected mode.

Agreements:

Proposal 1a (modified): Include a "Scheduled Location Time" with measurement time information in LPP CommonIEsRequestLocationInformation, defining the desired time when the location measurements or location estimate is to be obtained/valid. FFS if the information is an absolute time or a window.

Proposal 1d: Include the capability to support scheduled location in each method-ProvideCapabilities message, where 'method' can be any of the LPP positioning methods. The capability should indicate the time base(s) supported for scheduling location measurements.

Proposal 1f: Based on decisions and agreements made on Proposals 1a-1e, Rapporteur for LPP running CR should take the TP in [13] R2-2200962 into account.

Pre-configured Assistance Data:

Stage 2:

Proposal 2a: Decide on additional Stage 2 impacts after further progress and agreements on "pre-configured assistance data" has been made (e.g., Proposals 3 below). Rapporteur for Stage 2 running CR will update Stage 2 accordingly.

Proposal 2b: If "pre-configured assistance data" turns out to be functionally different compared to current Assistance Data Transfer mechanisms, a definition of "pre-configured assistance data" should be added to e.g., Stage 2.

Validity Conditions:

Proposal 3a: Pre-configured assistance data can be associated with a "validity area". FFS on details.

Proposal 3b: Pre-configured assistance data can be associated with a "validity time". FFS on details.

Proposal 3c: Pre-configured assistance data can be explicitly modified or released. FFS on details.

Proposal 3d: Pre-configured assistance data can consist of multiple instances, where each instance is applicable to a different area within the network. FFS on details.

Discussion:

Nokia think only area validity is needed. CATT have the same understanding.

Qualcomm think we could apply P3a/P3b to DL-PRS assistance data and both of these are functionally needed. In general, they see that the DL-PRS assistance data should not be associated with a specific configuration; they do not see the need for P3c and think it would make the LMF remember the AD configuration per UE, including potentially sharing this information between multiple LMFs. InterDigital have the same understanding.

ZTE agree with Qualcomm regarding P3a/P3b; on P3c, they think modification is already supported in the current spec and do not see the latency benefit of having a release operation.

Intel understand that if we do not have P3c, we need to specify whenever the UE receives assistance data, it releases any stored AD. They think P3c is clearer regarding sync between the UE and the network.

Lenovo share Qualcomm’s concern on P3c.

vivo agree with Intel that the modification in P3c provides useful flexibility, and they think P3a/P3b are essential.

CATT have a concern about the validity time, because the network does not know the UE’s mobility state and has a hard time selecting an appropriate validity time. So they think it is not workable from network side. Ericsson also have a concern and think the PRS may be dynamic, e.g. because of the on-demand mechanism. Ericsson also support P3d; Fraunhofer agree in this respect.

Intel doubt if P3d is needed and do not see the use case where the network needs to provide multiple configurations over a very large area.

Qualcomm wonder if we would have the validity information in broadcast also or only in LPP.

OPPO think P3d is functionally similar to P3a and allows the network to configure AD for different areas.

Agreements:

Proposal 3a (modified): Pre-configured DL-PRS assistance data can be associated with a "validity area" at least in LPP. FFS on details and whether it would be included in RRC broadcast.

Proposal 3e: Based on agreements and further progress on Proposals 3a-3d, specific UE behaviour/procedures may need to be specified. FFS on details.

Measurement Gaps for Positioning:

RRC:

Proposal 4a: The pre-configured Measurement Gap Configurations for Positioning are provided via RRCReconfiguration message. FFS whether an existing IE can be re-used for adding the pre-configured Measurement Gap Configurations for Positioning or whether a new IE should be introduced.

Proposal 4b: The content of a pre-configured Measurement Gap for Positioning Configuration includes at least the existing measurement gap parameter and an ID. Other parameter are FFS.

Proposal 4c: The existing RRC LocationMeasurementIndication procedure to request the positioning measurement gaps can still be used by a UE, even when pre-configured measurement gaps are provided to the UE.

Proposal 4d: Concurrent measurement gap can only be associated with only multiple pre-configured gaps for positioning, but there can be only one activated measurement gap at a time.

Proposal 4e: Network-Controlled Small Gap is not supported for PRS measurement.

MAC:

Proposal 5a: A new UL MAC CE for positioning measurement gap activation and deactivation request is introduced.

Proposal 5b: The new UL MAC CE for positioning measurement gap activation and deactivation request includes at least the ID of the pre-configured positioning measurement gap configuration for which the activation/deactivation is requested. Other parameter are FFS.

Proposal 5c: A new DL MAC CE for positioning measurement gap activation and deactivation command is introduced.

Note, if this Proposal is agreed, RAN2 may need to send an LS to RAN1 confirming that DL MAC CE can also be used for positioning measurement gap deactivation.

Proposal 5d: The new DL MAC CE for positioning measurement gap activation and deactivation command includes at least the ID of the pre-configured positioning measurement gap configuration which has been configured/activated by the gNB. Other parameter are FFS.

Proposal 5e: The Scheduling Request should be triggered when there is no PUSCH and UL MAC CE for positioning measurement gap activation/deactivation request is triggered.

Discussion:

Ericsson think it is unfortunate that RAN1 took this agreement and they do not see a latency benefit; they think RRC configuration will work and is easier to extend.

Nokia think the RAN4 LS suggested that it should be RRC, and this should be discussed in RAN2, but they are not sure how best to resolve the discrepancy.

CATT think option 1 in the RAN1 LS is not workable, because it is hard for the LMF to activate the measurement gap: The LMF does not know the actual DL-PRS resources that the UE measures, and it does not know the MG configuration. They think the use of a MAC CE is appropriate and it is not necessary to introduce another mechanism.

Qualcomm understand that at the beginning of the WI, we decided to leave this as a RAN1 topic, and now we have concerns with the RAN1 decision. From a functional point of view they do not see a problem. They understand that if we do not need the MAC CEs, we do not need the MG preconfiguration feature as a whole. ZTE agree with Qualcomm; so do Huawei.

Huawei think we should follow RAN1 unless there is a problem. On Nokia’s point, they think the agreement from RAN4 was from the perspective of MG enhancement and the RAN1 agreement is from the perspective of positioning latency reduction.

vivo agree with Qualcomm and Huawei about the RAN1 conclusion, and on the CATT question, they think option 1 can work if seen as assistance data from the LMF to the gNB for the MG configuration.

Ericsson could accept a working assumption. Nokia are not fundamentally worried about the proposal but want to make sure RAN1/4 are clear on what we are doing.

Huawei note there was an agreement under MG enhancements not to have a new DL MAC CE.

CATT do not support LMF activation of the measurement gap and want it to be clear in the LS to RAN1 that we have the gNB activating the measurement gap.

Intel understand that what RAN1 agreed is that the LMF can indicate something to the gNB, and then the gNB can use the MAC CE-based activation, with the details up to RAN3. Huawei agree.

Agreements:

Proposal 5a: A new UL MAC CE for positioning measurement gap activation and deactivation request is introduced.

Proposal 5b: The new UL MAC CE for positioning measurement gap activation and deactivation request includes at least the ID of the pre-configured positioning measurement gap configuration for which the activation/deactivation is requested. Other parameter are FFS.

Proposal 5c (modified): A new DL MAC CE for positioning measurement gap activation and deactivation command is introduced for positioning latency reduction. LS to RAN1/4 indicating our conclusion, and confirming that DL MAC CE can also be used for positioning measurement gap deactivation as well as activation (to be drafted by email).

Proposal 5d: The new DL MAC CE for positioning measurement gap activation and deactivation command includes at least the ID of the pre-configured positioning measurement gap configuration which has been configured/activated by the gNB. Other parameter are FFS.

Proposal 5e: The Scheduling Request should be triggered when there is no PUSCH and UL MAC CE for positioning measurement gap activation/deactivation request is triggered.

Proposal 5f: Based on decisions and agreements made on Proposals 5a-5e, Rapporteur for MAC running CR should take the TPs in [4] R2-2200304 and [7] R2-2200430 into account.

NRPPa:

Proposal 6a: The information that needs to be transferred between LMF and gNB to support the positioning measurement gap configuration and pre-configuration may include one or more of the following options:

- DL-PRS configuration of the relevant TRPs

- Positioning measurement gap capabilities of the UE

- Positioning QoS

- Explicit Positioning measurement gap configuration information (e.g., as defined in RRC GapConfig)

- Positioning measurement gap configuration information as defined in RRC LocationMeasurementIndication message

FFS on other option(s).

FFS on which option(s) are needed.

FFS on whether different information content is needed for positioning measurement gap configuration and positioning measurement gap pre-configuration.

Stage 2:

Proposal 7a: Based on decisions and agreements made on Proposals 4-6, Rapporteur for Stage 2 running CR should take the TPs in [5] R2-2200326 and [7] R2-2200430 into account.

PRS Processing Window

RRC:

Proposal 8a: The PRS processing window configuration can be provided to the UE via RRCReconfiguration using one of the following options:

- configured per BWP

- included in MeasConfig

FFS on other option(s).

Proposal 8b: Based on decisions and agreements made on Proposal 8a, Rapporteur for RRC running CR should take the TP in [15] R2-2201069 into account.

MAC:

Proposal 9a: A new DL MAC CE for PRS Processing Window activation and deactivation command is introduced.

Note, if this Proposal is agreed, RAN2 may need to send an LS to RAN1 confirming that DL MAC CE can also be used for PRS Processing Window deactivation.

Proposal 9b: The new DL MAC CE for PRS Processing Window activation and deactivation command includes at least the ID of the pre-configured PRS Processing Window configuration. Other parameter are FFS.

Proposal 9c: The UE behaviour related to the PRS Processing Window feature is captured in the MAC specification.

Proposal 9d: RAN2 to discuss and decide, whether UL MAC CE can also be used for PRS processing window activation/deactivation. If agreed, RAN2 may need to send an LS to RAN1.

Proposal 9e: Based on decisions and agreements made on Proposals 9a-d, Rapporteur for MAC running CR should take the TPs in [7] R2-2200430 into account.

NRPPa:

Proposal 10a: The information that needs to be transferred between LMF and gNB to support PRS Processing Windows may include one or more of the following options:

- DL-PRS configuration of the relevant TRPs

- PRS Processing Window capabilities of the UE

- PRS Processing Window configuration information analogous to RRC LocationMeasurementIndication message

- Priority assigned to DL-PRS

FFS on other option(s).

FFS on which option(s) are needed.

Stage 2:

Proposal 11a: Based on decisions and agreements made on Proposals 8-10, Rapporteur for Stage 2 running CR should take the TPs in [5] R2-2200326 and [7] R2-2200430 into account.

Other:

Proposal 12a: Company Proposals in section 4.3 should be discussed individually if time permits.

Proposal 13a: Company Proposals in section 5 should be discussed individually if time permits.

* [AT116bis-e][616][POS] Remaining proposals on latency reduction (Qualcomm)

Scope: Discuss the remaining proposals on validity conditions for preconfigured assistance data, measurement gaps, and PRS processing window.

Intended outcome: Report to CB session in R2-2201875

Deadline: Friday 2022-01-21 1600 UTC

[R2-2201875](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2201875_(%5b616%5d%5bPOS%5d%20Latency%20Reduction)_Summary.docx) Summary of [AT116bis-e][616][POS] Remaining proposals on latency reduction Qualcomm Incorporated discussion Rel-17 NR\_pos\_enh-Core

Easy agreements:

Measurement Gaps

Proposal 4: The pre-configured Measurement Gap Configurations for Positioning are provided via RRCReconfiguration message. The pre-configured Measurement Gap Configurations for Positioning are included in IE MeasGapConfig.

Proposal 5: The content of the pre-configured Measurement Gap Configurations for Positioning includes at least the existing measurement gap parameters together with an ID identifying each Measurement Gap Configuration for Positioning.

Proposal 6: The existing RRC LocationMeasurementIndication procedure to request the positioning measurement gaps can still be used by a UE, even when pre-configured measurement gaps are provided to the UE.

Agreements:

Proposal 4: The pre-configured Measurement Gap Configurations for Positioning are provided via RRCReconfiguration message. The pre-configured Measurement Gap Configurations for Positioning are included in IE MeasGapConfig.

Proposal 5: The content of the pre-configured Measurement Gap Configurations for Positioning includes at least the existing measurement gap parameters together with an ID identifying each Measurement Gap Configuration for Positioning.

Proposal 6: The existing RRC LocationMeasurementIndication procedure to request the positioning measurement gaps can still be used by a UE, even when pre-configured measurement gaps are provided to the UE.

PRS Processing Windows

Proposal 7: The PRS processing window configuration is provided via RRCReconfiguration message. Whether PRS processing window configuration is provided per BWP or not is up to RAN1 to decide.

Proposal 8: A new DL MAC CE for PRS Processing Window activation and deactivation command is introduced.

Proposal 9: The new DL MAC CE for PRS Processing Window activation and deactivation command includes at least the ID of the pre-configured PRS Processing Window configuration, at least in the case when multiple PRS Processing Windows can be configured.

Proposal 10: The UE behaviour related to the PRS Processing Window feature is captured in the MAC specification.

Agreements:

Proposal 7: The PRS processing window configuration is provided via RRCReconfiguration message. Whether PRS processing window configuration is provided per BWP or not is up to RAN1 to decide.

Proposal 8: A new DL MAC CE for PRS Processing Window activation and deactivation command is introduced.

Proposal 9: The new DL MAC CE for PRS Processing Window activation and deactivation command includes at least the ID of the pre-configured PRS Processing Window configuration, at least in the case when multiple PRS Processing Windows can be configured.

Proposal 10: The UE behaviour related to the PRS Processing Window feature is captured in the MAC specification.

Potential easy agreements:

Validity Conditions for DL-PRS Assistance Data

Proposal 3: Pre-configured DL-PRS assistance data can consist of multiple instances, where each instance is applicable to a different area within the network. FFS on additional specification impacts and whether this can already be supported with the agreement made that pre-configured DL-PRS assistance data can be associated with a "validity area".

Discussion:

OPPO can accept preconfigured DL-PRS AD in multiple instances, but wonder if we should discuss a capability for the number of instances in the next meeting or the post-meeting discussion. Intel think we should have a general discussion on what the UE can support, and then decide on the capability; they will capture it as an open issue.

Qualcomm think there may be a special case where we only need one instance and each TRP has its own area ID.

Agreement:

Proposal 3: Pre-configured DL-PRS assistance data can consist of multiple instances, where each instance is applicable to a different area within the network. FFS on additional specification impacts and whether this can already be supported with the agreement made that pre-configured DL-PRS assistance data can be associated with a "validity area". Single instance of AD is not excluded; FFS if there would be signalling for multiple area IDs in the same instance. Signalling details can be discussed in the LPP running CR discussion.

Proposals requiring further discussions:

Validity Conditions for DL-PRS Assistance Data

Proposal 1: RAN2 to discuss further whether pre-configured assistance data should be associated with a "validity time" or not.

Proposal 2: RAN2 to discuss further whether pre-configured assistance data could be explicitly modified or released.

Conclusions (no immediate RAN2 action):

- On the concurrent measurement gap, RAN2 wait for further input from RAN1/RAN4.

- On the Network-Controlled Small Gap, RAN2 wait for further input from RAN1/RAN4.

- An LMF needs to provide "assistance information" to a gNB to support measurement gap (pre-)configuration.

- The information that needs to be transferred between LMF and gNB to support the positioning measurement gap (pre-)configuration can be decided by RAN3.

- Whether UL MAC CE can also be used for PRS processing window activation/deactivation should be decided by RAN1.

- The information that needs to be transferred between LMF and gNB to support the PRS Processing Windows configuration can be decided by RAN3.

Discussion:

Huawei understand that RAN4 have excluded NCSG for PRS measurement.

Nokia think RAN1 have agreed on MAC CE signalling for preconfigured measurement gap activation/deactivation, we found that not useful, and we need some alignment. Should be handled as an open issue. Intel understood that there was a majority to align with the RAN1 agreement in offline discussion, and they think it should be discussed as part of MG coordination in the main session.

Agreements:

- On the concurrent measurement gap, RAN2 wait for further input from RAN1/RAN4.

- On the Network-Controlled Small Gap, RAN2 wait for further input from RAN1/RAN4.

- An LMF needs to provide "assistance information" to a gNB to support measurement gap (pre-)configuration.

- The information that needs to be transferred between LMF and gNB to support the positioning measurement gap (pre-)configuration can be decided by RAN3.

- Whether UL MAC CE can also be used for PRS processing window activation/deactivation should be decided by RAN1.

- The information that needs to be transferred between LMF and gNB to support the PRS Processing Windows configuration can be decided by RAN3.

The following documents will not be individually treated

[R2-2200256](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200256%20Discussion%20on%20positioning%20latency%20reduction.docx) Discussion on positioning latency reduction ZTE discussion

[R2-2200278](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200278.docx) Leftover issues on Latency reduction Intel Corporation discussion Rel-17 NR\_pos\_enh-Core

[R2-2200279](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200279.docx) RAN1 issues on Latency reduction Intel Corporation discussion Rel-17 NR\_pos\_enh-Core

[R2-2200304](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200304%20Discussion%20on%20latency%20reduction%20enhancement.docx) Discussion on latency reduction enhancement CATT discussion Rel-17 NR\_pos\_enh-Core

[R2-2200326](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200326%20Discussion%20on%20latency%20enhancement_cl.docx) Discussion on latency enhancement vivo discussion Rel-17 NR\_pos\_enh-Core

[R2-2200428](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200428%20Discussion%20on%20pre-configured%20PRS.docx) Discussion on PRS preconfiguration Huawei, HiSilicon discussion Rel-17 NR\_pos\_enh-Core

[R2-2200430](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200430%20Discussion%20on%20MGenh%20and%20PPW%20for%20positioning%20latency%20reduction.docx) Discussion on MG/PPW enhancement for positioning Huawei, HiSilicon discussion Rel-17 NR\_pos\_enh-Core

[R2-2200559](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Docs\R2-2200559.zip) Further consideration of positioning latency enhancements OPPO discussion Rel-17 NR\_pos\_enh-Core

[R2-2200709](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200709%20Positioning%20enhancement%20on%20latency%20reduction.doc) Positioning enhancement on latency reduction. Xiaomi discussion

[R2-2200730](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200730%20Discussion%20on%20the%20response%20time.docx) Discussion on the response time Samsung discussion Rel-17 NR\_pos\_enh-Core

[R2-2200914](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200914_Pos_latency.docx) Considerations on positioning latency Sony discussion Rel-17 NR\_pos\_enh-Core

[R2-2200958](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200958_RRC_INACTIVE_Fraunhofer_Ericsson_Lenovo_Vivo.docx) Providing a list of AD for reducing signalling load and latency Fraunhofer IIS; Fraunhofer HHI; Ericsson; Lenovo; Vivo discussion

[R2-2200962](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200962_(Scheduling%20Location%20in%20Advance).docx) Remaining Issues on Scheduling Location in Advance Qualcomm Incorporated discussion

[R2-2200988](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200988_PosLatencyReduction_LenMM.docx) On Positioning Latency Reduction Enhancements Lenovo, Motorola Mobility discussion Rel-17

[R2-2201069](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2201069%20RRC%20and%20MAC%20Impacts.docx) Discussion On RRC and MAC Impacts, TP on RRC Impacts Ericsson discussion Rel-17

[R2-2201184](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2201184%20(R17%20NR%20POS%20WI_AI8112_Latency).doc) Discussion on Enhancements for Latency Reduction InterDigital, Inc. discussion Rel-17 NR\_pos\_enh-Core

[R2-2201185](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2201185%20(R17%20NR%20POS%20WI_AI8112_Latency_MG).doc) Discussion on Measurement Gap and PRS Priority Enhancements InterDigital, Inc. discussion Rel-17 NR\_pos\_enh-Core

[R2-2201309](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2201309%20(8.11.2)%20Simulation%20study%20for%20multiple%20QoS%20class%20handling%20for%20latency%20reduction.docx) Simulation study for multiple QoS class handling for latency reduction Samsung R&D Institute UK discussion

[R2-2201311](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2201311%20(8.11.2)%20multiple%20QoS%20handling%20for%20latency%20reduction.docx) Handling of multiple QoS for latency reduction Samsung R&D Institute UK discussion R2-2111083

[R2-2201312](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2201312%20(8.11.2)%20latency%20reduction%20by%20MG%20config.docx) Latency reduction via new measurement gap activation Samsung R&D Institute UK discussion

### 8.11.3 RRC\_INACTIVE

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

Summary document

[R2-2201068](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2201068%20RRC%20Inactive%20Summary.docx) Summary of AI 8.11.3 RRC\_INACTIVE Ericsson discussion Rel-17 Late

Easy Proposals:

Proposal 1 To support UL positioning in RRC\_INACTIVE, reuse SDT TA timer for TA validation.

Proposal 2 To support UL positioning in RRC\_INACTIVE, reuse RSRP change based solution for TA validation

Proposal 3 The SRSp configuration is considered as invalid if TA is not valid.

Proposal 4 When cell reselection is performed and UE initiates RRC resume procedure to the cell which is different from the cell in which the SRSp is configured, the TA timer configuration for SRS should be released.

Proposal 5 The SRSp configuration is released when the UE sends RRCResumeRequest to an gNB other than the gNB where it is released to RRC\_INACTIVE state.

Proposal 6 BWP info together with the SRS-PosResourceSet IE is included in RRCRelease message for SRS configuration in RRC\_INACTIVE.

Proposal 7 RAN2 confirms RAN1 agreement that UE may be configured to transmit UL SRS for Positioning where the following parameters are additionally configured for the transmission of the SRS for Positioning during the RRC\_INACTIVE state: frequency location and bandwidth, SCS, CP length.

Proposal 8 Add the restriction on AP SRS in the field description of resourceType “The aperiodic is not applicable for the UE in RRC\_INACTIVE.”.

Discussion:

Qualcomm wonder what the “reuse” in P1/P2 means; they are not clear if the proposal is for a new similar timer or to reuse the exact same timer. Huawei have the same question. Ericsson understood the intention was to reuse the mechanism with a separate timer.

ZTE are fine with following the SDT mechanism for release, but think it is only workable when there is no cell reselection. So they think the validity conditions need discussion. CATT agree and think P1-P5 have a precondition that the SRSp is configured for the original cell.

Huawei think the cell reselection issue is addressed by P5.

OPPO agree with P3 and think the configuration is cell-specific; they wonder if we need to release the SRSp configuration if the TA is not valid. Huawei think we have not agreed this for CG-SDT.

Intel think we do not optimise positioning for mobility in RRC\_CONNECTED and therefore do not need to worry about the cell reselection case in RRC\_INACTIVE. Ericsson agree with Intel.

Huawei think we are repeating discussion from CG-SDT, and in that case, the reason the UE does not release the resource is because the network is unaware that the UE reselected; the UE releases the resource only on transmission of RRCResumeRequest.

Intel think this is a different case from CG-SDT in that the SRSp may be measured by other gNBs that received the configuration from LMF, and these gNBs cannot continue their measurement if the UE changes cell. Huawei think this would be an optimisation and prefer to keep the CG-SDT approach.

Agreements:

Proposal 1 (modified) To support UL positioning in RRC\_INACTIVE, reuse SDT TA timer mechanism (with a separate timer with similar function) for TA validation.

Proposal 2 To support UL positioning in RRC\_INACTIVE, reuse RSRP change based solution for TA validation

Proposal 3 The SRSp configuration is considered as invalid if TA is not valid.

Proposal 4 When cell reselection is performed and UE initiates RRC resume procedure to the cell which is different from the cell in which the SRSp is configured, the TA timer configuration for SRS should be released.

Proposal 5 (modified) The SRSp configuration is released when the UE sends RRCResumeRequest to a cell other than the cell where it is released to RRC\_INACTIVE state.

Proposal 6 BWP info together with the SRS-PosResourceSet IE is included in RRCRelease message for SRS configuration in RRC\_INACTIVE.

Proposal 7 RAN2 confirms RAN1 agreement that UE may be configured to transmit UL SRS for Positioning where the following parameters are additionally configured for the transmission of the SRS for Positioning during the RRC\_INACTIVE state: frequency location and bandwidth, SCS, CP length.

Proposal 8 Add the restriction on AP SRS in the field description of resourceType “The aperiodic is not applicable for the UE in RRC\_INACTIVE.”.

FFS if the TA timer configuration is invalidated upon any cell reselection.

LS related Proposals:

Proposal 14 RAN2 to decide how to capture the stage 2 details in specification

A. It is not necessary to introduce the new positioning procedures in stage 2 specification for RRC inactive UE positioning [8]

B. Send LS to SA2 to let SA2 decide the spec impacts [12, 3]. Use [R2-2200961] as baseline

C. Capture in TS 38.305 [12]

Proposal 23 RAN2 to send an LS to RAN4 as provided in [14] asking UE measurements validity when UE has performed measurements in different RRC states. Should the previous measurements be discarded, or can it be continued after state transition.

Discussion:

Huawei understand the intention of P23 but think this is already being discussed in RAN4. From RAN2 perspective they do not see stage 3 impact.

Intel think the only impact would be if RAN4 agree that the measurement in different RRC states would be different, and then we would have to trigger the UE to stop measurements at state transition. Since we have not received anything from RAN4, they consider that we don’t have to do anything.

Proposals expected to be treated:

Stage 2:

[UL] Proposal 9 RAN2 to agree to one of the options when to provide Event Report Ack.

A. A note can be added in procedure proposed by [7] saying Step 5 may appear after step 7

B. It is agreed that event report ACK is provided once the UL-positioning has been successfully configured at the UE and TRPs

Discussion:

Qualcomm think the acknowledgement should be sent when everything has finished, and from a UE point of view we should have the same behaviour independent of the positioning method.

vivo think if the ack is triggered after the SRSp configuration is completed, it is not aligned with SA2 specs and the UE behaviour becomes different in different RRC states.

Huawei think option B is aligned with the stage 2 proposal from the Huawei/joint document. The concern is that the gNB might accidentally release the UE prematurely, and they think this case is not common or critical to address; they think the LMF can prevent a premature release without SRSp configuration. Intel agree that we do not need to address this case.

Qualcomm think as a baseline, we should have common behaviour for all positioning methods. If the network sends it earlier, it can do that as a matter of implementation, but this is not in line with what SA2 have described.

Proposal 10 RAN2 to discuss the need for gNB to be aware of precisely when to transit the UE to Inactive and further ensuring the transition is not to idle; if needed; which option to opt for;

A. RAN3 based NRPPa Assistance Information

B. Similar to existing “"end indication"”

C. UE to indicate gNB about ongoing downlink positioning session

Proposal 11 RAN2 to decide whether the LPP moreMessagesOnTheWay/noMoreMessages flag should be visible at the serving gNB when sending the RRC Resume Request + Event Report

Discussion:

Qualcomm think the gNB should have assistance information from somewhere, and the UE is in the best position to provide it by making moreMessageOnTheWay visible to the gNB. However, they understand that RAN3 have agreed on option A, but do not see how it can work after the beginning of the session.

Intel do not see a strong need to have this indication, but think RAN3’s agreement on option A resolves the issue and we should avoid duplicated discussion. Huawei and vivo agree with Intel.

ZTE think the gNB will wait long enough that if LPP messages are being transmitted, the gNB will wait. Qualcomm think the gNB does not know if these are LPP messages.

CATT agree that RAN3 have discussed option A, but they prefer option B in combination with it.

Agreement:

RAN2 will not make additional effort to make the gNB aware of when to transit the UE to RRC\_INACTIVE (left to gNB implementation and RAN3 solution).

Discussion:

vivo do not think the indication is useful; the gNB implementation can handle it.

Assistance data delivery:

Proposal 12 RAN2 to discuss whether to revert the agreement to provide AD during ongoing SDT procedure or add the procedure in stage2.

WA on preconfigured SRS in RRC\_CONNECTED:

[UL] Proposal 13 RAN2 to discuss not to support pre-configuration of positioning SRS in RRC\_CONNECTED.

Stage 2 spec impact (contingent on conclusion of P14):

Proposal 15 If there is consensus to capture the stage 2 details in TS 38.305 then the baseline is taken from [6] (Huawei et al.) paper.

Proposal 16 If If there is consensus to capture the stage 2 details in TS 38.305 then RAN2 to discuss whether a common flow is used to depict UL and UL+DL positioning.

Proposal 17 If If there is consensus to capture the stage 2 details in TS 38.305 then RAN2 to discuss whether UE can include the LCS Event Report an embedded LPP Request Assistance Data message with IE NR-Multi-RTT-RequestAssistanceData and nr-AdType set to 'ul-srs' to request an UL-SRS for Multi-RTT positioning.

Proposal 18 RAN2 to discuss the need to capture LPP PDU and LCS message transfer procedures with SDT in RRC\_INACTIVE state in Stage 2 TS 38.305 [8].

Proposal 19 RAN2 to discuss whether to capture LPP PDU and LCS message transfer in RRC\_INACTIVE state in TS 38.305.

Segmentation:

Proposal 20 RAN2 to discuss whether LPP Segmentation violates any architectural constrains (application layer segmenting data to enable a certain transport selection by lower layer) and if this should be allowed.

LCS service types:

Proposal 21 RAN2 to decide which service types can be supported using SDT active period

RRM measurements:

Proposal 22 RAN2 to discuss support of RRC\_INACTIVE reporting of RRM measurements along with other DL-based positioning methods.

[UL] Proposal 24 RAN2 to discuss whether UE UL SRS configuration provided in one mode is applicable in other; if yes, RAN2 to discuss whether an indication can be used from NW to UE to support such continuity.

* [AT116bis-e][617][POS] Remaining issues on positioning in RRC\_INACTIVE (Ericsson)

Scope: Discuss the remaining prioritised proposals from R2-2201068.

Intended outcome: Report to CB session in R2-2201772

Deadline: Friday 2022-01-21 1600 UTC

[R2-2201772](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2201772%20Inactive%20Summary.docx) [AT116bis-e][617][POS] Remaining issues on positioning in RRC\_INACTIVE (Ericsson) Ericsson discussion Rel-17

Potential Stage 3 related for UL SRS Tx In RRC Inactive:

Proposal 3 The agreement with WA: pre-configure positioning SRS in RRC\_CONNECTED is removed.

Proposal 12 No indication is added from NW to UE for the continuity of UL SRS Tx when transiting from one mode to other.

Proposal 11 Send an LS to RAN4 asking whether the (measurement) requirements in inactive mode and connected mode are different.

Discussion:

ZTE suggest sending an LS to RAN4 on whether SRS configured in one state can be used in another.

Ericsson indicate that we may not be able to turn an LS around in the available time, and maybe this can be addressed in Rel-18. They understand that most companies’ view is that the posSRS have to be configured by RRCRelease.

Huawei would like to clarify if the LS to RAN4 as proposed by ZTE would be only for UL-SRS, and think the applicability of posSRS in different states is not a RAN4 issue.

Ericsson think it is related to the question in P11.

Intel think P12 can be agreed; they see the indication as an optimization. Regarding P3, they do not see a problem with reverting the WA. Huawei and CATT agree with Intel.

ZTE think if we are going to send an LS, we could discuss P3 and P12 afterwards; if we are going to take the proposals, we do not need the LS.

Ericsson understand that we do not need the LS if we agree P3/P12.

ZTE can accept P3 for Rel-17. For P12, they would like it to be open for Rel-18.

Fraunhofer can accept P3.

Nokia are fine with P12; on P3, they can accept majority view but are a bit surprised that there is uncertainty about whether we have a clear definition of preconfiguration.

Qualcomm think we agreed on a definition of preconfiguration for DL-PRS. On P12, they think it is not necessary to have a negative agreement.

Agreements:

Proposal 3 The agreement with WA: pre-configure positioning SRS in RRC\_CONNECTED is removed.

Proposal 12 (modified) No indication is added in Rel-17 from NW to UE for the continuity of UL SRS Tx when transiting from one mode to other.

Scope of RRC Inactive:

Proposal 10 All LCS service types are allowed to use SDT.

Stage 2 Note Only or Detailed Description:

Proposal 4 RAN2 to decide whether note is sufficient or overall procedure needs to be captured for DL, UL and UL+DL positioning in RRC Inactivate mode

Proposal 2 RAN2 to decide whether note is sufficient or overall procedure needs to be captured for Positioning AD delivery using SDT

Proposal 8 RAN2 to decide whether note is sufficient or overall procedure needs to be captured for LPP PDU and LCS message transfer in RRC Inactivate mode

Proposal 5 RAN2 to agree not to add elaborative description/flow diagrams in TS 38.305.

Stage 2 Other Proposal dependent upon above P4, P2, P8 and P5:

Proposal 1 If the UL-only and UL and DL positioning is agreed to capture in the specification; A note is added to say that when to send Event Report ACK is up to NW implementation

Proposal 6 RAN2 to wait to decide whether to go for common flow or separate flow; i.e to be discussed after the outcome of previous proposals 4 and 5.

Proposal 7 It is not necessary to capture explicitly in stage 2 that UE can include in the LCS Event Report an embedded LPP Request Assistance Data message with IE NR-Multi-RTT-RequestAssistanceData and nr-AdType set to 'ul-srs' to request an UL-SRS for Multi-RTT positioning.

Potential Rel-18 Discussion:

Proposal 9 RAN2 to discuss segmentation in Rel-18.

The following documents will not be individually treated

[R2-2200257](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200257%20Discussion%20on%20positioning%20in%20RRC%20INACTIVE%20state.docx) Discussion on positioning in RRC INACTIVE state ZTE discussion

[R2-2200280](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200280%20Support%20of%20UL&UL+DL%20positioning%20in%20RRC_INACTIVE.docx) Support of UL&UL+DL positioning in RRC\_INACTIVE Intel Corporation discussion Rel-17 NR\_pos\_enh-Core

[R2-2200295](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200295%20Impact%20on%20SA2%20with%20DL%20NR%20Positioning%20in%20RRC_INACTIVE%20state.docx) Impact on SA2 with DL NR positioning in RRC\_INACTIVE CATT, Ericsson discussion Rel-17 NR\_pos\_enh-Core

[R2-2200296](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200296%20Considerations%20on%20UL%20NR%20Positioning%20in%20RRC_INACTIVE%20state.docx) Discussion on UL NR Positioning in RRC\_INACTIVE state CATT discussion Rel-17 NR\_pos\_enh-Core

[R2-2200327](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200327%20Discussion%20on%20positioning%20in%20RRC_INACTIVE_cl.docx) Discussion on positioning in RRC\_INACTIVE vivo discussion Rel-17 NR\_pos\_enh-Core

[R2-2200424](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200424%20Way-forward%20for%20RRC_INACTIVE%20positioning.docx) Way-forward for RRC\_INACTIVE positioning Huawei, CATT, China Unicom, CMCC, Fraunhofer, Futurewei, HiSilicon, Intel Corporation, Spreadtrum Communications, OPPO, VIVO, Xiaomi, ZTE Corporation discussion Rel-17 NR\_pos\_enh-Core

[R2-2200425](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200425%20Remaining%20issues%20on%20RRC_INACTIVE%20DL%20Postioning.docx) Remaining issues on RRC\_INACTIVE DL Postioning Huawei, HiSilicon discussion Rel-17 NR\_pos\_enh-Core

[R2-2200710](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200710%20Discussion%20on%20positioning%20for%20UE%20in%20RRC%20Inactive.doc) Discussion on positioning for UE in RRC Inactive Xiaomi discussion

[R2-2200731](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200731%20Discussion%20on%20the%20measurement%20reporting%20in%20RRC_INACTIVE.docx) Discussion on the measurement reporting in RRC\_INACTIVE Samsung discussion Rel-17 NR\_pos\_enh-Core

[R2-2200781](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200781-%20Discussion%20on%20Positioning%20in%20RRC_INACTIVE%20state.docx) Discussion on Positioning in RRC\_INACTIVE state OPPO discussion Rel-17 NR\_pos\_enh-Core

[R2-2200957](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200957_RRC_INACTIVE_Uplink_Fraunhofer.docx) Remaining Details for RRC\_INACTIVE Positioning in Uplink Fraunhofer IIS; Fraunhofer HHI discussion Rel-17 R2-2110249

[R2-2200963](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200963_(Positioning%20in%20RRC_INACTIVE).docx) Remaining issues for positioning of UEs in RRC\_INACTIVE State Qualcomm Incorporated discussion

[R2-2200989](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200989_RRCInactive_Positioning_LenMM.docx) Remaining aspects on RRC\_INACTIVE Positioning Lenovo, Motorola Mobility discussion Rel-17

[R2-2201065](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2201065%20RRC%20Inactive%20.docx) Discussion on RRC Inactive mode Positioning Ericsson discussion Rel-17

[R2-2201186](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2201186%20(R17%20NR%20POS%20WI%20AI8113_INACTIVE).doc) Discussion on Positioning in RRC INACTIVE state InterDigital, Inc. discussion Rel-17 NR\_pos\_enh-Core

[R2-2201528](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2201528.docx) Positioning in RRC\_INACTIVE Nokia Germany discussion Rel-17

[R2-2200961](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200961_(LS%20to%20SA2%20on%20RRC_INACTIVE).docx) [draft] LS on Positioning in RRC\_INACTIVE State Qualcomm Incorporated LS out Rel-17 NR\_pos\_enh To:SA2 Cc:RAN3

### 8.11.4 On-demand PRS

Specify UE-initiated and LMF-initiated on-demand transmission and reception of DL PRS for DL and DL+UL positioning for UE-based and UE-assisted positioning solutions.

Including outcome of [Post116-e][601][POS] Network control and UE request for on-demand PRS parameters (Ericsson)

Email discussion summary

[R2-2200047](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200047%20ODPRS.docx) Report on Procedures and signalling for on-demand PRS Ericsson discussion

Proposal 1 On demand PRS request based upon explicit indication is supported. RAN2 further discusses (via other Proposals) the details whether any parameter/value or only NW indicated parameter/value to be included in the request; i.e Proposal 2.

Discussion:

Qualcomm wonder if this just confirms RAN1 agreements or adds something else, e.g. additional parameters. They are OK with the RAN1 agreements.

Apple wonder if RAN1 actually agreed to have an explicit indication, and what the benefit of requesting specific parameters would be (if that is the intent of the proposal).

Ericsson indicate that RAN1 gave detailed parameters for what the UE can request, and our discussion came to reasonable consensus that there is a need for requesting the parameters explicitly, e.g. in case there are not predefined configurations. In their view the main question is whether the UE can request additional parameter values beyond what the network indicates, but it is clear from RAN1 that there is a request and what the concerned parameters are.

CATT think RAN1 have the expertise for determining the parameters, and RAN2 should focus on the parameters that were sent from RAN1.

Nokia think RAN1 did not agree to an “explicit indication”, and note that these proposals do not use the term “predefined configuration” (i.e. with an index) but think the point is whether we would rely on such a predefined configuration or also allow the UE to request parameters flexibly. They would prefer to rely on an index to simplify implementation for the LMF. Fraunhofer have the same concern.

Proposal 3 UE initiates on-demand PRS request only after NW provides the available DL-PRS configurations to UE either using posSIB or LPP dedicated Signaling.

Discussion:

Nokia are concerned about the word “available” and whether it means that only predefined configurations are supported. They are OK with the proposal if it refers to predefined PRS configurations. Qualcomm have the same understanding.

ZTE think if the UE can only request based on the network configuration, it may be hard to design appropriate configurations.

Lenovo think that relying only on the available DL-PRS configurations may be too limiting. They are OK with proposal 3 but think we should not rely on that alone.

Qualcomm think there should be no indication required from the network; the UE can always request. For the case that the LCS client resides in the UE, their concern is that the UE would not have a way to request DL-PRS when the DL-PRS are not yet switched on, especially if broadcast AD would not be mandatory for the functionality.

Intel think if the client in the UE wants to request DL-PRS AD, the existing mechanism is sufficient and we don’t need to rely on the on-demand mechanism.

Huawei think the issue is network capability: If the UE requests something (e.g. bandwidth) that the network does not support, the request is useless, and we cannot require all LMFs to support on-demand PRS request. They think we could first agree on the predefined configuration and leave the explicit parameters as FFS.

vivo think the LMF could provide a range of values that the UE could select the explicit parameters from.

CATT understand that Qualcomm’s concern is for MO-LR on-demand cases, where the UE would not be able to formulate the MO-LR if there is no posSIB broadcast.

Ericsson understood that there are concerns about using this mechanism in the MO-LR case and potentially having a request for something the network does not support.

Qualcomm think it is critical to be able to do a blind request from the UE, but it would be OK to have the RequestAssistanceData include a request for what the network supports. They note that the UE today can request assistance data that the network does not support, and the network then will not provide it.

Chair understands that this would mean the UE indicates in RequestAssistanceData that it wants to request something, and the LMF replies with the indication that it can support on-demand requests. Intel have a concern for the additional latency. Ericsson think there is also a preference from some companies that the network would indicate capability in advance.

Huawei think for predefined configurations, the network should still send the configuration first; otherwise there is no way the UE can send the blind request. They understand that if the LMF has received the UE capability for on-demand PRS, it should always send the predefined configurations to the UE.

Sony think different UEs may have different preferences at different times, so even if the UE capability is known to the LMF, the UE should be able to request explicit parameters for what it needs at the moment. They agree with Qualcomm that the network should not be forced to indicate in advance what is available.

Huawei think for MO-LR, the UE can indicate its capability piggybacked on the LCS message, allowing the network to know that it supports on-demand PRS, and the network could reply with a ProvideAssistanceData indicating what is available.

Chair understands we have two proposed models: (1) MO-LR indicates the blind request and the LMF may or may not reply with a configuration, or (2) MO-LR indicates the capability or need for on-demand PRS, and the LMF replies with what configurations are available.

Proposal 4 UE does not need to include NR ECID (RRM measurements) in MO-LR message while requesting for DL-PRS AD .

Proposal 5 For NW control mechanism on on-Demand PRS, UE requests on-demand PRS only on prior reception of on-demand PRS configuration.

Proposal 6 For On-Demand PRS, posSI cannot be the response for On-Demand PRS request.

Agreements:

If the LMF indicates predefined configurations, the UE can request them via LPP RequestAssistanceData.

Proposal 2 RAN2 to discuss and decide for explcit indication whether any parameter/value or only NW indicated parameter/value can be included in the request.

Discussion:

Ericsson think there was a majority for explicit indication, and the question is whether the network provides the bounds based on the Rel-16 parameters. They understand that it works either way and we should understand if there is a big concern.

Nokia think the explicit indication is too complex for the LMF. Qualcomm see it as unnecessary complexity.

Agreement:

LPP signalling supports index-based and explicit request of DL-PRS parameters from the UE. The UE is not required to implement requesting explicit parameters and the LMF is not required to grant them if the UE does request.

Other documents

[R2-2200258](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200258%20Discussion%20on%20on-demand%20PRS.docx) Discussion on on-demand PRS ZTE discussion

[R2-2200281](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200281.docx) Support of On-Demand PRS request Intel Corporation discussion Rel-17 NR\_pos\_enh-Core

[R2-2200303](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200303%20Discussion%20on%20on-demand%20PRS.docx) Discussion on on-demand PRS CATT discussion Rel-17 NR\_pos\_enh-Core

[R2-2200328](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200328%20Discussion%20on%20on-demand%20PRS_cl.docx) Discussion on on-demand PRS vivo discussion Rel-17 NR\_pos\_enh-Core

[R2-2200426](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200426%20Discussion%20on%20on-demand%20PRS.docx) Discussion on on-demand PRS Huawei, HiSilicon discussion Rel-17 NR\_pos\_enh-Core

[R2-2200711](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200711%20Positioning%20enhancement%20about%20on-demand%20DL%20PRS%20.doc) Positioning enhancement about on-demand DL PRS Xiaomi discussion

[R2-2200780](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200780%20-%20Discussion%20on%20on-demand%20DL-PRS.doc) Discussion on on-demand DL-PRS OPPO discussion Rel-17 NR\_pos\_enh-Core

[R2-2200915](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200915_Pos_PRS_Ondemand.docx) Considerations on positioning PRS On-demand and two stage beam sweeping Sony discussion Rel-17 NR\_pos\_enh-Core

[R2-2200956](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200956_OnDemandPRS_Fraunhofer.docx) On-demand PRS Fraunhofer IIS, Fraunhofer HHI discussion Rel-17 R2-2110247 Withdrawn

[R2-2200964](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200964_(On-demand%20PRS).docx) Remaining issues for on-demand DL-PRS Qualcomm Incorporated discussion

[R2-2200993](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200993_On-DemandPRS_LenMM.docx) Remaining issues on On-Demand DL-PRS Lenovo, Motorola Mobility discussion Rel-17

[R2-2201067](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2201067%20On-demand%20PRS.docx) Remaining issues on On-demand PRS Ericsson discussion Rel-17

[R2-2201103](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2201103-on-demand-PRS-v0.docx) On the need for additional On-Demand PRS enhancements Apple discussion NR\_pos\_enh-Core

[R2-2201187](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2201187%20(R17%20NR%20POS%20WI_AI8114_OnDemandPRS).doc) Discussion on On-demand PRS InterDigital, Inc. discussion Rel-17 NR\_pos\_enh-Core

[R2-2201257](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2201257.docx) Network Control Mechanisms for On-demand PRS Nokia, Nokia Shanghai Bell discussion Rel-17 NR\_pos\_enh-Core

[R2-2201267](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2201267.docx) On the on-demand PRS Stage 2 Nokia, Nokia Shanghai Bell discussion Rel-17 NR\_pos\_enh-Core

[R2-2201273](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2201273.docx) Pre-configured and Pre-defined PRS Nokia, Nokia Shanghai Bell discussion Rel-17 NR\_pos\_enh-Core

[R2-2201313](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2201313%20(8.11.4)%20on%20demand%20PRS%20for%20positioning.docx) On-demand PRS request and configuration Samsung R&D Institute UK discussion

[R2-2201627](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2201627_OnDemandPRS_Fraunhofer.docx) On-demand PRS Fraunhofer IIS, Fraunhofer HHI discussion Rel-17 R2-2110247

### 8.11.5 GNSS positioning integrity

Signalling, and procedures to support GNSS positioning integrity determination.

Including outcome of [Post116-e][602][POS] Stage 2 baseline for integrity assistance data (Swift)

* [AT116bis-e][611][POS] GNSS integrity (Swift)

Scope: Start discussion of the proposals from R2-2200012 to determine agreeability and resulting spec impact. Extended to develop initial stage 3 proposals taking R2-2201214 into account, including value range and resolution of parameters where possible.

Intended outcome: Report to Wednesday online session in R2-2201761 (including revision of R2-2200012 if needed); for extension, report to Monday CB session in R2-2201765.

Deadline: Tuesday 2022-01-18 2200 UTC – extended to Friday 2022-01-21 1800 UTC

[R2-2201761](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2201761%20-%20%5bAT116bis-e%5d%5b611%5d%5bPOS%5d%20GNSS%20integrity%20(Swift)_SUMMARY.docx) Report of [AT116bis-e][611][POS] GNSS integrity (Swift) Swift discussion

Proposal 1: RAN2 agrees to add the Integrity Principle of Operation (Clause 8.1.1a) text from Appendix A (R2-2201761) into TS 36.305 and TS 38.305.

Proposal 2: Agree to add the descriptions from Appendix A (R2-2201761) for the SSR Code Bias (8.1.2.1.23), SSR Phase Bias (8.1.2.1.24), SSR STEC Corrections (8.1.2.1.25) and SSR Gridded Corrections (8.1.2.1.26) as baseline. Final wording is subject to the outcomes of Stage 3 and depends on which integrity IEs and associated fields are included in LPP.

Proposal 3: Agree to add the Integrity Service Parameters (8.1.2.1.29) and Integrity Alerts (8.1.2.1.30) descriptions from Appendix A (R2-2201761) into TS 36.305 and TS 38.305.

Proposal 4: RAN2 agrees to include the description for the Orbit Clock Error Bounds, as per Appendix A (R2-2201761), but the final description is FFS subject to the Stage 3 discussions on whether option (b), (c) or (d) is preferred (or another alternative):

(b) Duplicate within the SSR Orbit and Clock IEs (NW determines which to include).

(c) Add orbit and clock integrity bounds (mean, sigma) to the existing Orbit and Clock IEs (but without the full covariance).

(d) Define a separate message as a new IE (i.e. a combined message for the Orbit Clock Error Bounds).

Discussion:

Qualcomm think the current stage 2 description only covers alternative c, and if we pick another alternative we will need to make some revisions to the stage 2.

Proposal 5: RAN2 agrees to include the Integrity Residual Risk Parameters into their existing corresponding GNSS IEs (as per Appendix A (R2-2201761). This discussion is also subject to the Stage 3 outcomes regarding which IEs and associated fields to define for integrity.

Proposal 6: Agree to add Section 8.1.2.1b-1 and Table 8.1.2.1b-1 (as per Appendix A (R2-2201761)) into TS 36.305 and TS 38.305. The field names in Table 8.1.2.1b-1 are subject to the outcomes of Stage 3 regarding which integrity IEs and associated fields to include in LPP.

Agreements:

Proposal 1: RAN2 agrees to add the Integrity Principle of Operation (Clause 8.1.1a) text from Appendix A (R2-2201761) into TS 36.305 and TS 38.305.

Proposal 2: Agree to add the descriptions from Appendix A (R2-2201761) for the SSR Code Bias (8.1.2.1.23), SSR Phase Bias (8.1.2.1.24), SSR STEC Corrections (8.1.2.1.25) and SSR Gridded Corrections (8.1.2.1.26) as baseline. Final wording is subject to the outcomes of Stage 3 and depends on which integrity IEs and associated fields are included in LPP.

Proposal 3: Agree to add the Integrity Service Parameters (8.1.2.1.29) and Integrity Alerts (8.1.2.1.30) descriptions from Appendix A (R2-2201761) into TS 36.305 and TS 38.305.

Proposal 4: RAN2 agrees to include the description for the Orbit Clock Error Bounds, as per Appendix A (R2-2201761), but the final description is FFS subject to the Stage 3 discussions on whether option (b), (c) or (d) is preferred (or another alternative):

(b) Duplicate within the SSR Orbit and Clock IEs (NW determines which to include).

(c) Add orbit and clock integrity bounds (mean, sigma) to the existing Orbit and Clock IEs (but without the full covariance).

(d) Define a separate message as a new IE (i.e. a combined message for the Orbit Clock Error Bounds).

Proposal 5: RAN2 agrees to include the Integrity Residual Risk Parameters into their existing corresponding GNSS IEs (as per Appendix A (R2-2201761). This discussion is also subject to the Stage 3 outcomes regarding which IEs and associated fields to define for integrity.

Proposal 6: Agree to add Section 8.1.2.1b-1 and Table 8.1.2.1b-1 (as per Appendix A (R2-2201761)) into TS 36.305 and TS 38.305. The field names in Table 8.1.2.1b-1 are subject to the outcomes of Stage 3 regarding which integrity IEs and associated fields to include in LPP.

[R2-2201765](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2201765%20-%20%5bAT116bis-e%5d%5b611%5d%5bPOS%5d%20GNSS%20integrity%20Extended%20(Swift).docx) [AT116bis-e][611][POS] GNSS integrity - Extended Discussion (Stage 3) (Swift) Swift discussion

Easily Agreeable

Based on the comments above and in alignment with Stage 2 we suggest that the following proposals are easily agreeable at the comebacks.

Proposal 1: Agree to add a new IE for the Integrity Service Parameters which contains the irMinimum and irMaximum fields. The IE will be included under GNSS-CommonAssistData.

Proposal 2: Agree to add a new IE for Integrity Service Alerts under GNSS-CommonAssistData which contains the Ionosphere DNU and Troposphere DNU.

FFS on whether to also include the Service DNU.

Proposal 4: Agree to add the Mean and Standard Deviation parameters for the Integrity Bounds within the existing SSR-Code-Bias, SSR-Phase-Bias, SSR-STEC-Correction and SSR-GriddedCorrection IEs in LPP, as per Table 3.2-1 in R2-2201765.

Proposal 6: RAN2 agrees to update Stage 2 with a description of the Mean Fault Duration parameters. The following changes are proposed in addition to the Stage 2 text updates that were agreed in R2-2201765, for inclusion into the running Stage 2 CR:

[Chair’s note: See R2-2201765 for the properly formatted and change-marked version of this proposal]

8.1.2.1.31 Integrity Residual Risk Parameters

Integrity Residual Risk Parameters are used to provide the residual risk parameters related to the satellite, constellation, ionosphere and troposphere residual risk probabilities. These parameters include a Probability of Onset which is defined per unit of time and represents the probability that the feared event begins. The Mean Duration represents the expected mean duration of the corresponding feared event and is used to convert the Probability of Onset to a probability that the feared event is present at any given time, i.e.

P(Feared Event is Present)= Mean Duration\*Probability of Onset of Feared Event

Proposal 8: Agree to include the Integrity Correlation Times parameters from Table 3.2-3 (R2-2201765) within the SSR-STEC-Correction and SSR-GriddedCorrection IEs in LPP, with updated field names as follows:

tCorrelationIonosphere changed to ionoRangeErrorCorrelationTime

tCorrelationIonosphereRate changed to ionoRangeRateErrorCorrelationTime

tCorrelationTroposphere changed to tropoRangeRateErrorCorrelationTime

tCorrelationTroposphereRate changed to tropoRangeRateErrorCorrelationTime

Agreements:

Proposal 1: Agree to add a new IE for the Integrity Service Parameters which contains the irMinimum and irMaximum fields. The IE will be included under GNSS-CommonAssistData.

Proposal 2: Agree to add a new IE for Integrity Service Alerts under GNSS-CommonAssistData which contains the Ionosphere DNU and Troposphere DNU.

FFS on whether to also include the Service DNU.

Proposal 4: Agree to add the Mean and Standard Deviation parameters for the Integrity Bounds within the existing SSR-Code-Bias, SSR-Phase-Bias, SSR-STEC-Correction and SSR-GriddedCorrection IEs in LPP, as per Table 3.2-1 in R2-2201765.

Proposal 6: RAN2 agrees to update Stage 2 with a description of the Mean Fault Duration parameters. The following changes are proposed in addition to the Stage 2 text updates that were agreed in R2-2201765, for inclusion into the running Stage 2 CR:

[Chair’s note: See R2-2201765 for the properly formatted and change-marked version of this agreement]

8.1.2.1.31 Integrity Residual Risk Parameters

Integrity Residual Risk Parameters are used to provide the residual risk parameters related to the satellite, constellation, ionosphere and troposphere residual risk probabilities. These parameters include a Probability of Onset which is defined per unit of time and represents the probability that the feared event begins. The Mean Duration represents the expected mean duration of the corresponding feared event and is used to convert the Probability of Onset to a probability that the feared event is present at any given time, i.e.

P(Feared Event is Present)= Mean Duration\*Probability of Onset of Feared Event

Proposal 8: Agree to include the Integrity Correlation Times parameters from Table 3.2-3 (R2-2201765) within the SSR-STEC-Correction and SSR-GriddedCorrection IEs in LPP, with updated field names as follows:

tCorrelationIonosphere changed to ionoRangeErrorCorrelationTime

tCorrelationIonosphereRate changed to ionoRangeRateErrorCorrelationTime

tCorrelationTroposphere changed to tropoRangeRateErrorCorrelationTime

tCorrelationTroposphereRate changed to tropoRangeRateErrorCorrelationTime

Open Issues

Based on the comments above, the following are suggested as open issues for post-meeting discussion.

Proposal 3 (Open Issue): RAN2 to discuss whether to modify the existing GNSS-RealTimeIntegrity IE or create a new IE to accommodate the Alerts for the satellite/constellation specific DNUs under GNSS-GenericAssistData.

Discuss whether a Constellation DNU and per-signal DNU should be included in addition to the SV DNU.

Proposal 5 (Open Issue): RAN2 to discuss whether or not the cross-covariance should be included for the Orbit and Clock integrity bounds and whether these bounds should be included as a new IE or within the existing SSR Orbit and Clock IEs.

Proposal 7 (Open Issue): RAN2 to discuss whether the Residual Risk parameters proposed in Table 3.2-2 (R2-2201765) should be integrated into their corresponding SSR correction IEs or within a separate standalone IE.

Proposal 9 (Open Issue): RAN2 to discuss whether a validity period needs to be defined for each of the bounds and what value ranges are appropriate if so.

Proposal 10 (Open Issue): RAN2 to discuss which of the assistance data should be sent as periodic assistance data.

Proposal 11 (Open Issue): RAN2 to discuss whether broadcast is supported for positioning integrity in Release 17 or a future release.

Discussion:

Qualcomm think we could resolve P11 by agreeing that we introduce a new posSIB for the new AD for integrity.

Ericsson think there is a general issue with SI scheduling and adding a posSIB exacerbates it.

Agreements:

Introduce a new posSIB for the new assistance data added for integrity.

Email discussion summary

[R2-2200012](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200012_%5bPost116-e%5d%5b602%5d%5bPOS%5d%20Stage%202%20Integrity%20AD%20Summary.docx) [Post116-e][602][POS] Stage 2 baseline for integrity assistance data (Swift) Swift discussion 36.305

Comments on running CRs

[R2-2200013](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200013_Running_CR%20of%2036_305%20GNSS%20Pos%20Integrity.docx) Running CR on 36.305 for Stage 2 integrity assistance data Swift draftCR Rel-17 36.305 16.4.0 B NR\_pos\_enh-Core

[R2-2200014](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200014_Running%20CR%20of%2038_305%20GNSS%20Pos%20Integrity.docx) Running CR on 38.305 for Stage 2 integrity assistance data Swift draftCR Rel-17 38.305 16.7.0 B NR\_pos\_enh-Core

Other documents

[R2-2200185](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200185%20Signalling%20for%20GNSS%20Positioning%20Integrity%20Framework.docx) Signalling for GNSS Positioning Integrity Framework Nokia, Nokia Shanghai Bell discussion Rel-17 FS\_NR\_pos\_enh

[R2-2200259](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200259%20Discussion%20on%20positioning%20integrity.docx) Discussion on positioning integrity ZTE discussion

[R2-2200329](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200329%20Discussion%20on%20GNSS%20positioning%20integrity_cl.docx) Discussion on GNSS positioning integrity vivo discussion Rel-17 NR\_pos\_enh-Core

[R2-2200427](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200427%20Remaining%20issues%20on%20positioning%20integrity.docx) Remaining issues on positioning integrity Huawei, HiSilicon discussion Rel-17 NR\_pos\_enh-Core

[R2-2200955](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200955_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 R2-2110246

[R2-2201063](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2201063%20GNSS%20Integrity.docx) On GNSS Integrity Ericsson discussion Rel-17

[R2-2201188](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2201188%20(R17%20NR%20POS%20WI%20AI8115_GNSS_Integrity).doc) Discussion on GNSS Positioning Integrity InterDigital, Inc. discussion Rel-17 NR\_pos\_enh-Core

[R2-2201214](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2201214%20-%20Stage3_GNSS_Integrity.docx) Stage 3 Proposals on GNSS Positioning Integrity Swift Navigation, Mitsubishi Electric Corporation, Ericsson discussion Rel-17

[R2-2201314](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2201314%20(8.11.5)%20Consideration%20on%20the%20signalling%20design%20for%20Positioning%20Integrity%20for%20UE%20based%20method.docx) Consideration on the signalling design for Positioning Integrity for UE-based method Samsung R&D Institute UK discussion

### 8.11.6 A-GNSS enhancements

Including support of BDS B2a and B3I signals and support of NavIC. This agenda item will not be treated online. Critical issues, if any, may be handled by email.

* [AT116bis-e][613][POS] BDS and NavIC CRs (CATT)

Scope: Review the draft CRs in R2-2200298/R2-2201070/R2-2200433, collect any comments, and revise the CRs if needed.

Intended outcome: Endorsed draft CRs (without CB) and report in R2-2201775

Deadline: Friday 2022-01-21 1600 UTC

[R2-2201775](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2201775%20Report%20of%20%5bAT116bis-e%5d%5b613%5d%5bPOS%5d%20BDS%20and%20NavIC%20CRs%20(CATT).docx) [AT116bis-e][613][POS] BDS and NavIC CRs (CATT) CATT discussion Rel-17 NR\_pos\_enh-Core

* Noted (email discussion [AT116bis-e][613])

[R2-2200298](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200298%20Introduction%20of%20B2a%20and%20B3I%20signal%20in%20BDS%20system%20in%20A-GNSS.docx) Introduction of B2a and B3I signal in BDS system in A-GNSS CATT, CAICT draftCR Rel-17 37.355 16.7.0 B NR\_pos\_enh-Core

* Endorsed (email discussion [AT116bis-e][613])

[R2-2201070](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2201070%20NavIC%20RRC.docx) Impacts of NavIC in NR RRC Ericsson discussion Rel-17

* Noted (email discussion [AT116bis-e][613])
* Related draft CR in R2-2201774

[R2-2200433](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200433%20Draft%20running%20CR%20for%20stage2%20spec%20for%20NavIC%20in%20R17%20positioning.docx) Draft running CR for stage2 spec for NAVIC in R17 positioning Huawei, HiSilicon draftCR Rel-17 38.305 16.7.0 B NR\_pos\_enh-Core

* Revised in R2-2201773 (email discussion [AT116bis-e][613])

R2-2201773 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

[R2-2201774](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2201774%20NavIC%20RRC.docx) Introduction of NavIC for broadcast support Ericsson draftCR Rel-17 38.331 16.7.0 B NR\_pos\_enh-Core

* Endorsed (email discussion [AT116bis-e][613])

### 8.11.7 Accuracy enhancements

Input on the accuracy enhancement objectives led by RAN1. This agenda item will not be treated online. Critical issues, if any, may be handled by email.

PRUs

* [AT116bis-e][614][POS] PRUs (Huawei)

Scope: Discuss the contributions on PRUs in AIs 8.11.7/8.11.8 and the related LSs in R2-2200139/R2-2200140, determine agreeable way forward, and analyse RAN2 spec impact. Draft a reply LS to SA2 if needed.

Intended outcome: Report to Monday CB session in R2-2200438 [tdoc number allocated before the meeting], and approvable LS if one is needed

Deadline: Friday 2022-01-21 1600 UTC

[Summary tdoc moved from AI 8.11.8]

[R2-2200438](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200438%20%5bAT116bis-e%5d%5b614%5d%5bPOS%5d%20PRUs%20(Huawei)_v18_summary2.docx) Summary of email discussion for PRU Huawei, HiSilicon discussion Rel-17 NR\_pos\_enh-Core Late

 For potential easy agreements

Proposal1: PRU should be completed in R17 from RAN2’s perspective. (10/15)

Proposal2: Support MO-LR for PRU. (13/16)

Proposal3: PRU can report PRU antenna orientation information to the LMF upon LMF request with Request/ProvideLocationInformation. (13/16)

Proposal4: LMF can know the UE’s known location by (a) LPP report (14/16), or (c) offline/pre-configuration (7/16)

Proposal5: PRU can also report the positioning measurements with the known location. FFS whether the following can also be reported a) Location uncertainty information, i.e., the QoS information; b) Stationary/mobility status; d) Estimated Tx/Rx timing error report; e) timeStamp

Proposal6: The UE capability for PRU can be discussed in the UE feature discussion in R1.

Discussion:

OPPO have a concern on P3 and would like to know how the PRU obtains this information; they understand that it is only obtainable if the PRU is a network device.

Qualcomm think P1 should say PRUs already are completed, because no LPP impact is needed. They also agree with OPPO’s comment on antenna orientation, and think it can go together with location information, which can be provided outside LPP. They think we should not add PRU-specific information into LPP.

Ericsson think we should not talk about “known” location without a clear definition of the level of accuracy/uncertainty.

Huawei indicate RAN1 agreed on signalling of antenna orientation information in the uplink direction.

CATT think we will need more detail from RAN1 and we cannot make decisions on the current level of detail.

Apple agree with Qualcomm that we should not have PRU-specific information in LPP. They have similar concerns to CATT on the antenna orientation information.

Lenovo think RAN1 will further clarify the antenna orientation information and we can agree P3 now. On P4, they wonder if there was a concern with option (b). Huawei clarify that option (b) did not have much support; Lenovo think it can be supported by the existing spec.

Nokia think we are waiting for RAN1 information on the antenna orientation. On the comment from Qualcomm and Apple, they think we have not previously agreed to exclude PRU impact and it is too early to make such a decision; in any case they think the PRU is a UE and can be addressed as a UE in LPP. On the “known location” terminology, they think we should not restrict to pre-instrumented (e.g. via OAM) information and think it could also be computed.

Qualcomm think MO-LR is not up to RAN2, and if the PRU is a UE, MO-LR can be supported without spec impact. They are also confused about the “known” location, since there is no facility in LPP to indicate that a location is known; they think it has to be done by configuration in this release.

Huawei agree with Qualcomm on MO-LR, in that if the motivation to support MO-LR is for registration of the LMF, it should be decided from SA2 perspective.

Agreement:

RAN2 will not discuss PRUs further without further guidance from RAN1 (LS or feature list).

 Leave for other groups to discuss/not supported

Proposal7.1: The following issues should be discussed in R1: Whether differential correction information should be provided to UE-based positioning methods

Proposal7.2: The following issues should be discussed in SA2: (a)Management of PRU and (b)PRU access and registration

Proposal7.3: The following are not supported

 Identifiers related to PRU operations are needed when transferring LPP signaling

 a new location information type as shown in Appendix A

[R2-2200283](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200283%20Support%20of%20PRU.docx) Support of PRU Intel Corporation discussion Rel-17 NR\_pos\_enh-Core

[R2-2200712](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200712%20Discussion%20on%20positioning%20reference%20unit.doc) Discussion on positioning reference unit Xiaomi discussion

[R2-2200994](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200994_PRUs_LenMM.docx) Support of Positioning Reference Units Lenovo, Motorola Mobility discussion Rel-17

[R2-2201064](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2201064%20PRU.docx) On the Positioning Reference Units aspects Ericsson discussion Rel-17

[R2-2201087](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2201087.docx) Way forward on PRUs for Rel-17 MediaTek Inc., Apple discussion Rel-17 NR\_pos\_enh-Core

[R2-2201191](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2201191%20(R17%20NR%20POS%20WI%20AI8117_PRU).doc) Discussion on supporting Positioning Reference Units InterDigital, Inc. discussion Rel-17 NR\_pos\_enh-Core

Other accuracy enhancements

* [AT116bis-e][612][POS] Positioning accuracy enhancements (Apple)

Scope: Discuss the contributions in AI 8.11.7 on accuracy enhancements (excluding PRU topics). Determine agreeable RAN2 spec impact from RAN1 conclusions and identify any issues requiring further RAN2 discussion.

Intended outcome: Report to Monday CB session in R2-2201768, draft LS to RAN1 in R2-2201869

Deadline: Friday 2022-01-21 1600 UTC

[R2-2201768](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2201768%20Summary%20of%20%5bAT116bis-e%5d%5b612%5d%5bPOS%5d%20Positioning%20accuracy%20(Apple)-phase-2_v05_Moderator(final).docx) Summary of [AT116bis-e][612][POS] Positioning accuracy enhancements (Apple) Apple discussion NR\_pos\_enh-Core

Proposals with unanimous consensus (for block approval)

Proposal 2.1-1: enhance LPP assistance data signalling to allow UE to request and LMF to provide TRP beam/antenna information.

Proposal 2.1-2: enhance LPP assistance data signalling to allow LMF to provide the association information of DL PRS resources with TRP Tx TEG ID.

Proposal 2.1-6: enhance LPP assistance data signalling to allow UE to request and LMF to provide the expected angle value and uncertainty.

Proposal 2.2-1: introduce in LPP RequestLocationInformation: request for UE Rx TEG ID, maximum number of Rx TEGs for the same PRS resource, request for UE Tx TEG ID, maximum number of RxTx TEGs for the same PRS resource, request for UE RxTx TEGD ID.

Proposal 2.2-2: introduce in LPP ProvideLocationInformation: UE Rx TEG IDs, UE Tx TEG IDs, and UE RxTx TEG IDs.

Proposal 2.2-3: introduce in LPP ProvideLocationInformation: multiple UE Rx-Tx time difference measurements (for N different UE Rx TEGs), and multiple UE Rx-Tx time difference measurements (for N different UE RxTx TEGs with the same UE Tx TEG).

Proposal 2.2-5: introduce support for an LMF to request and UE to report first path PRS RSRP for DL-AoD.

Proposal 2.2-6: introduce support for extended additional paths beyond 2.

Proposal 2.2-7: introduce support a LoS/NLoS indication per RSTD, RSRP and UE RxTx measurements.

Discussion:

ZTE have some confusion about P2.2-1 on the maximum number of Tx TEGs for the same PRS resource; they wonder if it should be SRS instead of PRS. Does it mean the LMF wants the UE to report the Tx TEGs for the PRS resource?

CATT clarify there is a typo that has been corrected and it now says RxTx TEGs, because there is no maximum number of Tx TEGs.

Huawei think the maximum number of RxTx TEGs should be for the UE Rx-Tx measurements instead of the same PRS resource, but this is more of a RAN1 aspect. In general they wonder if we should take these agreements or wait for more detail/updates from RAN1.

Intel think we need to capture the RAN1 parameters and shouldn’t spend much time on it.

Nokia understand that the proposals are aligned with RAN1, but companies can check with their RAN1 delegates.

Qualcomm think for DL-TDOA, the LMF can tell the UE to measure the same DL-PRS resource with up to 8 RxTx TEGs. They agree it is a RAN1 issue.

Agreements:

Proposal 2.1-1: enhance LPP assistance data signalling to allow UE to request and LMF to provide TRP beam/antenna information.

Proposal 2.1-2: enhance LPP assistance data signalling to allow LMF to provide the association information of DL PRS resources with TRP Tx TEG ID.

Proposal 2.1-6: enhance LPP assistance data signalling to allow UE to request and LMF to provide the expected angle value and uncertainty.

Proposal 2.2-1: introduce in LPP RequestLocationInformation: request for UE Rx TEG ID, maximum number of Rx TEGs for the same PRS resource, request for UE Tx TEG ID, maximum number of RxTx TEGs for the same PRS resource, request for UE RxTx TEGD ID.

Proposal 2.2-2: introduce in LPP ProvideLocationInformation: UE Rx TEG IDs, UE Tx TEG IDs, and UE RxTx TEG IDs.

Proposal 2.2-3: introduce in LPP ProvideLocationInformation: multiple UE Rx-Tx time difference measurements (for N different UE Rx TEGs), and multiple UE Rx-Tx time difference measurements (for N different UE RxTx TEGs with the same UE Tx TEG).

Proposal 2.2-5: introduce support for an LMF to request and UE to report first path PRS RSRP for DL-AoD.

Proposal 2.2-6: introduce support for extended additional paths beyond 2.

Proposal 2.2-7: introduce support a LoS/NLoS indication per RSTD, RSRP and UE RxTx measurements.

Potentially agreeable proposals (for discussion)

Proposal 2.1-3: to include the association information of DL PRS resources with TRP Tx TEG ID in posSIB.

Discussion:

Qualcomm think RAN1 will not tell us what should be broadcast and we should broadcast all AD as usual.

Huawei understand RAN1 have already agreed this AD for UE-based, and agree with QC that we should broadcast all the AD.

vivo think this is a stage 3 design issue, and if we include it in the existing posSIB for the UE-based AD, it’s already supported.

Apple and Intel agree with Qualcomm and Huawei.

Proposal 2.1-4: include in the LPP assistance data the information about subset of PRS resources for the purpose of prioritization of DL-AOD reporting.

Proposal 2.1-5: include in the LPP assistance data the the boresight direction information.

Proposal 2.2-4: to continue discussing in the next meeting discuss which the RRC message (UEAssistanceInformation, new RRC message, RRCReconfigurationComplete, none (LPP is enough)) to use to convey the information about signalling for association of UL SRS resources with UE Tx TEGs ID.

Discussion:

Intel understand RAN1 agreed that the UE reports this to the gNB and gNB forwards it to LMF, so it should be in RRC. Huawei agree with Intel for UL-TDOA, but for multi-RTT they think LPP is needed, and they think multiple RRC messages can be used for different situations.

Apple agree RAN1 made that agreement, but wonder if it was RAN1’s decision to make; normally the RRC vs. LPP decision would be made in RAN2, and if the information is for the LMF, there seems no benefit to sending it to the gNB.

Huawei think LPP is not available for UL-TDOA, so RRC is the only choice. vivo also think RRC is useful for UL-TDOA.

Nokia understand that RAN1 agreed on RRC specifically for UL-TDOA, and also agreed that for multi-RTT the UE can report directly to LMF. Intel have the same understanding.

Ericsson think P2.1-3 should mention an existing posSIB. Qualcomm and Huawei think it should be discussed in running CR development.

Agreements:

Proposal 2.1-3: to include the association information of DL PRS resources with TRP Tx TEG ID in posSIB.

Proposal 2.1-4: include in the LPP assistance data the information about subset of PRS resources for the purpose of prioritization of DL-AOD reporting.

Proposal 2.1-5: include in the LPP assistance data the the boresight direction information.

For UL-TDOA, RRC signalling is used to convey the information about signalling for association of UL SRS resources with UE Tx TEGs ID to the gNB. For multi-RTT, LPP is used. FFS which RRC message(s) are used.

To continue the discussion in the next meeting

Proposal 2.2-4: to continue discussing in the next meeting the RRC signalling for association of UL SRS resources with UE Tx TEGs ID.

Proposal 2.3: to continue the positioning capabilities discussion in the next meeting.

[R2-2201869](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2201869%20Reply%20LS%20on%20the%20reporting%20of%20the%20Tx%20TEG%20association%20information.docx) Reply LS on the reporting of the Tx TEG association information CATT LS out Rel-17 NR\_pos\_enh-Core To:RAN1, RAN3 Cc:RAN4

* Approved as R2-2201776

[R2-2201870](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2201870%20Accuracy%20enhancement%20TP%20for%2038.305.docx) Accuracy enhancement TP for 38.305 CATT discussion Rel-17 NR\_pos\_enh-Core

Discussion:

Nokia think the last version used the UEAssistanceInformation for the UE Tx TEGs ID, but we decided to leave it open. CATT clarify this is indicated as FFS and should be further discussed.

* Endorsed for merge into the running CR (details alignment with the above agreements to be handled in post-meeting email discussion on the CR)

[R2-2200297](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200297%20Discussion%20on%20addtional%20TRP%20beam%20and%20antenna%20information.docx) Discussion on additional TRP beam/antenna information CATT discussion Rel-17 NR\_pos\_enh-Core

[R2-2200299](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200299%20Discussion%20on%20stage-2%20impact%20of%20mitigating%20UE%20and%20TRP%20RxTx%20timing%20delays.docx) Discussion on stage-2 impact of mitigating UE and TRP RxTx timing delays CATT discussion Rel-17 NR\_pos\_enh-Core

[R2-2200300](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200300%20Discussion%20on%20LPP%20and%20RRC%20signaling%20impact%20of%20mitigating%20UE%20and%20TRP%20RxTx%20timing%20delays.docx) Discussion on LPP and RRC signaling impact of mitigating UE and TRP RxTx timing delays CATT discussion Rel-17 NR\_pos\_enh-Core

[R2-2200301](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200301%20%5bDraft%5dReply%20LS%20on%20the%20reporting%20of%20the%20Tx%20TEG%20association%20information(R1-2112968).docx) [Draft]Reply LS on the reporting of the Tx TEG association information CATT LS out Rel-17 NR\_pos\_enh-Core To:RAN1, RAN3 Cc:RAN4

[R2-2200330](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200330%20Discussion%20on%20accuracy%20enhancements_cl.docx) Discussion on accuracy enhancements vivo discussion Rel-17 NR\_pos\_enh-Core

[R2-2200429](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200429%20Discussion%20on%20accuracy%20enhancement.docx) Discussion on accuracy enhancement Huawei, HiSilicon discussion Rel-17 NR\_pos\_enh-Core

[R2-2200916](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200916_Pos_PRU_TEG.docx) Considerations on Timing Error aspects Sony discussion Rel-17 NR\_pos\_enh-Core

[R2-2201062](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2201062%20LPP%20High%20Accuracy.docx) LPP Positioning enhancements on timing errors , DL-AoD and LoS/NLoS/multipath Ericsson discussion Rel-17

[R2-2201104](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2201104-accuracy-RAN1-v1.docx) Signalling impacts of RAN1 agreements on accuracy enhancements Apple discussion NR\_pos\_enh-Core

[R2-2201189](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2201189%20(R17%20NR%20POS%20WI%20AI8117_AccEnh).doc) Discussion on Accuracy Enhancements InterDigital, Inc. discussion Rel-17 NR\_pos\_enh-Core

[R2-2201360](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2201360%20Discussion%20on%20accuracy%20improvement%20for%20UE-assisted%20DL-AOD%20positioning_cl.docx) Discussion on accuracy improvement for UE-assisted DL-AOD positioning vivo discussion Rel-17 NR\_pos\_enh-Core

[R2-2200527](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200527%20Discussion%20on%20signalling%20support%20of%20RAN1%20agreements.docx) Discussion on signalling support of RAN1 agreements ZTE discussion

[R2-2201066](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2201066%20Beam%20information%20for%20DL%20AOD%20in%20NR%20.docx) Beam/antenna information for DL AOD in NR positioning Ericsson discussion Rel-17

### 8.11.8 Other

Input on other WI objectives. This agenda item will not be treated online. Critical issues, if any, may be handled by email.

[R2-2200331](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200331%20Discussion%20on%20positioning%20reference%20unit_cl.docx) Discussion on positioning reference unit vivo discussion Rel-17 NR\_pos\_enh-Core

[R2-2200965](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202201%20-%20RAN2_116bis-e,%20Online\Extracts\R2-2200965_(PRUs).docx) On PRU support in Release-17 Qualcomm Incorporated discussion

# Post-Meeting Email Discussions

* [Post116bis-e][620][Relay] 38.300 running CR (MediaTek)

Scope: Check and endorse the running CR considering decisions of RAN2#116bis-e.

Intended outcome: Endorsed CR

Deadline: Friday 2022-01-28 0800 UTC

* [Post116bis-e][621][Relay] 38.304 running CR (Ericsson)

Scope: Check and endorse the running CR considering decisions of RAN2#116bis-e.

Intended outcome: Endorsed CR

Deadline: Friday 2022-01-28 0800 UTC

* [Post116bis-e][622][Relay] 38.306 running CR (Qualcomm)

Scope: Check and endorse the running CR considering decisions of RAN2#116bis-e.

Intended outcome: Endorsed CR

Deadline: Friday 2022-01-28 0800 UTC

* [Post116bis-e][623][Relay] 38.321 running CR (Apple)

Scope: Check and endorse the running CR considering decisions of RAN2#116bis-e.

Intended outcome: Endorsed CR

Deadline: Friday 2022-01-28 0800 UTC

* [Post116bis-e][624][Relay] 38.322/38.323 running CRs (Samsung)

Scope: Check and endorse the running CRs considering decisions of RAN2#116bis-e.

Intended outcome: Endorsed CRs

Deadline: Friday 2022-01-28 0800 UTC

* [Post116bis-e][625][Relay] 38.331 running CR (Huawei)

Scope: Check and endorse the running CR considering decisions of RAN2#116bis-e.

Intended outcome: Endorsed CR

Deadline: Friday 2022-01-28 0800 UTC

* [Post116bis-e][626][Relay] 38.351 running CR (OPPO)

Scope: Check and endorse the running CR considering decisions of RAN2#116bis-e.

Intended outcome: Endorsed CR

Deadline: Friday 2022-01-28 0800 UTC

* [Post116bis-e][627][POS] 36.305/38.305 integrity running CRs (InterDigital)

Scope: Check and endorse the running CRs considering decisions of RAN2#116bis-e.

Intended outcome: Endorsed CRs

Deadline: Friday 2022-01-28 0800 UTC

* [Post116bis-e][628][POS] 37.355 running CR (Qualcomm)

Scope: Check and endorse the running CR considering decisions of RAN2#116bis-e.

Intended outcome: Endorsed CR

Deadline: Friday 2022-01-28 0800 UTC

* [Post116bis-e][629][POS] 38.305 RAT-dependent positioning running CR (Intel)

Scope: Check and endorse the running CR considering decisions of RAN2#116bis-e.

Intended outcome: Endorsed CR

Deadline: Friday 2022-01-28 0800 UTC

* [Post116bis-e][630][POS] 38.306 running CR (Intel)

Scope: Check and endorse the running CR considering decisions of RAN2#116bis-e.

Intended outcome: Endorsed CR

Deadline: Friday 2022-01-28 0800 UTC

* [Post116bis-e][631][POS] 38.331 RAT-dependent positioning running CR (Ericsson)

Scope: Check and endorse the running CR considering decisions of RAN2#116bis-e.

Intended outcome: Endorsed CR

Deadline: Friday 2022-01-28 0800 UTC

* [Post116bis-e][632][POS] 38.321 RAT-dependent positioning running CR (Huawei)

Scope: Check and endorse the running CR considering decisions of RAN2#116bis-e.

Intended outcome: Endorsed CR

Deadline: Friday 2022-01-28 0800 UTC

* [Post116bis-e][633][Relay] Relay open issues list (OPPO)

Scope: Develop a list of open issues to be used to prepare for RAN2#117-e.

Intended outcome: Endorsed open issue list

Deadline: Friday 2022-01-28 0800 UTC

* [Post116bis-e][634][POS] Positioning open issues list (Intel)

Scope: Develop a list of open issues to be used to prepare for RAN2#117-e.

Intended outcome: Endorsed open issue list

Deadline: Friday 2022-01-28 0800 UTC