3GPP TSG-RAN WG2 Meeting #123bis R2-23xxxxx

Xiamen, China, October 9th – 13th, 2023

Source: Session Chair (MediaTek)

Title: Report from session on positioning and sidelink relay

# 4 EUTRA Rel-17 and earlier

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

## 4.4 Positioning corrections Rel-16 and earlier

(LTE\_NavIC-Core, LTE TEI16 Positioning), REL-15 and Earlier WIs related to positioning are in scope but not listed explicitly (long list).

This Agenda Item will be handled by email.

# 5 NR Rel-15 and Rel-16

Essential corrections only.

Tdoc Limitation: 6 tdocs in total for all sub agenda items.

In case a correction need to be reflected in both NR TS and LTE TS, the corrections should be submitted under one single AI (so the NR and LTE correction can be treatee together), the sub-Ais below this

## 5.3 NR Positioning Support

(NR\_newRAT-Core; leading WG: RAN1; REL-15; started: Mar. 17; closed: Jun. 19: WID: [RP-191971](http://ftp.3gpp.org/tsg_ran/TSG_RAN/TSGR_85/Docs/RP-191971.zip))

(NR\_pos-Core; leading WG: RAN1; REL-16; started: Mar 19; target; Jun 20; WID: [RP-200218](http://ftp.3gpp.org/tsg_ran/TSG_RAN/TSGR_87e/Docs/RP-200218.zip)).

(NR TEI16 Positioning)

### 5.3.1 General and Stage 2 corrections

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

[R2-2309620](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2309620%20Correction%20to%2038.305%20on%20NR%20E-CID%20-%20r16_final.docx) Correction to 38.305 on NR E-CID Huawei, HiSilicon CR Rel-16 38.305 16.9.0 0143 - F NR\_pos-Core

* Not pursued

[R2-2309621](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2309621%20Correction%20to%2038.305%20on%20NR%20E-CID%20-%20r17_final.docx) Correction to 38.305 on E-CID r17 Huawei, HiSilicon CR Rel-17 38.305 17.6.0 0144 - A NR\_pos-Core

* Not pursued

Discussion:

Intel think it is correct but not essential. Ericsson have the same view and think the fields can be taken for granted.

### 5.3.2 Stage 3 corrections (RRC/LPP/MAC/capabilities)

[R2-2309622](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2309622%20Correction%20to%2038.331%20on%20GNSS-ID%20R16_final.docx) Correction to 38.331 on GNSS-ID r16 Huawei, HiSilicon CR Rel-16 38.331 16.14.0 4309 - F NR\_pos-Core

[R2-2309623](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2309623%20Correction%20to%2038.331%20on%20GNSS-ID%20R17_final.docx) Correction to 38.331 on GNSS-ID r17 Huawei, HiSilicon CR Rel-17 38.331 17.6.0 4310 - A NR\_pos-Core

Discussion:

Lenovo think the CR resembles a condition rather than the field description. They would prefer language of the form “if the UE includes this field it shall set gnss-ID to sbas” rather than mandatory present/absent otherwise.

Huawei think the UE sets first the GNSS ID and then determines that it is SBAS.

Intel think the intention is that if GNSS ID is not SBAS, the UE shall not set this field, so they see Lenovo’s proposal as correct.

Lenovo note that the coversheet has the wrong WI code (should be NR\_pos).

Ericsson think the change may not be essential since any UE implementation will do this.

* Added sentence to be replaced with “If the UE includes this field it shall set gnss-ID to sbas”.
* WI code to be corrected.
* Agreed in principle with these changes, as R2-2311370 (Rel-16) and R2-23011371 (Rel-17)

[R2-2309624](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2309624%20Correction%20to%2037.355%20on%20broadcast%20information%20element%20R15_final.docx) Correction to 37.355 on broadcast information element Huawei, HiSilicon CR Rel-15 37.355 15.3.0 0467 - F NR\_newRAT-Core

* Not pursued

[R2-2309625](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2309625%20Correction%20to%2037.355%20on%20broadcast%20information%20element%20R16_final.docx) Correction to 37.355 on broadcast information element-r16 Huawei, HiSilicon CR Rel-16 37.355 16.12.0 0468 - A NR\_newRAT-Core

* Not pursued

[R2-2309626](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2309626%20Correction%20to%2037.355%20on%20broadcast%20information%20element%20R17_final.docx) Correction to 37.355 on broadcast information element-r17 Huawei, HiSilicon CR Rel-17 37.355 17.6.0 0469 - A NR\_newRAT-Core

* Not pursued

Discussion:

Qualcomm think the change is wrong; the intention is that the UE can decode each segment individually and use it, unlike octet string segmentation. Ericsson have the same understanding.

[R2-2310849](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2310849%20GNSSF.docx) GNSS SSR corrections and notes Ericsson CR Rel-16 37.355 16.12.0 0472 - F NR\_pos-Core

* Not pursued (topic can be discussed as an enhancement to later releases)

[R2-2310850](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2310850%20GNSSA.docx) GNSS SSR corrections and notes Ericsson CR Rel-17 37.355 17.6.0 0473 - A NR\_pos-Core

* Not pursued

Discussion:

Qualcomm understand we agreed to use the compact SSR format, and the changes extend beyond this to more quality fields per grid point; they understand that one quality is enough, and the grid can always be subdivided if needed. On the additional formulae, they think a reference is enough and we do not need to copy the details in from the ICD.

Ericsson think we are not consistent in this respect so far, and the double reference is not a good idea.

Swift think it may be helpful to be a bit more explicit in our spec, and they would like some more checking.

Ericsson think we could discuss offline.

Qualcomm think nothing is wrong in Rel-16, and it would be OK to discuss this as an enhancement but not as a correction in the legacy releases. Intel agree and think it could be a TEI18. Nokia also agree that the quality indicators are an enhancement, and they feel the IDC details should not be captured.

Swift are OK to discuss it as an enhancement, and they understand that we do not need to wait for RTCM. For the references, they think we can be contribution-driven, but they see that generally there is benefit in more explicit clarity in LPP.

Withdrawn/Not available

R2-2309644 Correction to 38.305 on E-CID r16 Huawei, HiSilicon discussion Rel-16 38.305 NR\_pos-Core Withdrawn

R2-2309645 Correction to 38.305 on E-CID r17 Huawei, HiSilicon discussion Rel-17 38.305 NR\_pos-Core Withdrawn

R2-2309646 Correction to 38.331 on GNSS-ID r16 Huawei, HiSilicon discussion Rel-16 38.331 NR\_pos-Core Withdrawn

R2-2309647 Correction to 38.331 on GNSS-ID r17 Huawei, HiSilicon discussion Rel-17 38.331 NR\_pos-Core Withdrawn

R2-2309648 Correction to 37.355 on broadcast information element-r15 Huawei, HiSilicon discussion Rel-15 37.355 NR\_newRAT-Core Withdrawn

R2-2309649 Correction to 37.355 on broadcast information element-r16 Huawei, HiSilicon discussion Rel-16 37.355 NR\_newRAT-Core Withdrawn

R2-2309650 Correction to 37.355 on broadcast information elementr-r17 Huawei, HiSilicon discussion Rel-17 37.355 NR\_newRAT-Core Withdrawn

# 6 NR Rel-17

Essential corrections only. Editorial/clarifications should be sent to be reviewed and approved by spec rapporteurs prior to submission. Editiorials should only be submitted by spec rapporteurs.

## 6.2 NR Sidelink relay

(NR\_SL\_Relay-Core; leading WG: RAN2; REL-17; WID: [RP-212601](http://ftp.3gpp.org/tsg_ran/TSG_RAN/TSGR_93e/Docs/RP-212601.zip))

Tdoc Limitation: 2 tdocs

### 6.2.1 Control plane and Stage-2 corrections

A single CR per TS with miscellaneous corrections is encouraged. Small editorial corrections should be sent directly to the CR rapporteur. Larger open issues can be discussed with contributions (limited time).

CR rapporteur summary

[R2-2311261](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2311261%20%5bPre123bis%5d%5b401%5d%5bRelay%5d.docx) Report of [Pre123bis][401][Relay] Rel-17 control plane corrections (Huawei) Huawei discussion Rel-17 NR\_SL\_relay-Core

38.300 corrections

Proposal 1: The stage 2 CRs in R2-2309918 and R2-2311220 are not essential, and not pursued.

Discussion:

Ericsson think on R2-2311220, RAN3 captured the message as a procedural step, and we should align with their procedure. Apple think it is OK to align with RAN3, but they have comments on the text; they think “configured by upper layers” is not needed and we can just say the UE is “triggered” to send the message.

Huawei agree that this change is technically correct, but there are a lot of SUI triggers and they think we should probably not add just this one; would we have to align a lot of other cases? Apple think this is quite an important case.

vivo are also OK with the intention of R2-2311220, but they think maybe we should check the general usage of the SUI in stage 2 and try to have a comprehensive fix.

Ericsson agree with Apple that this case is important for alignment across specifications; they agree it may not be needed for all cases.

OPPO understand that the intention is to align to RAN3, and they would like more time to check and decide if this case is needed.

Ericsson indicate that this step is explicitly mentioned in RAN3 because it is connected to the inter-gNB procedures.

Lenovo think the SUI message is captured in Rel-16, and we do not need to change anything.

OPPO think R2-2309918 is needed to align across specs; they understand that the related agreement referred to by Huawei in the document is to address an issue with multiple services sharing the same L2ID, but this case was later determined not to exist based on SA2 guidance. So they think stage 3 is correct and stage 2 should be updated.

MediaTek have the same understanding as OPPO.

vivo think stage 2 already indicates that the upper layer will release the link, so they do not see a misalignment.

Xiaomi think the concern was for buffered data, and the intention of the deleted text is to allow the UE to keep the connection for a short time; it does not mean that the UE will not release the link at all. OPPO think on this point, if the UE does not release the link, the network may assume it has been released and reconfigure the UE accordingly; normally we handle configuration changes immediately. Xiaomi think it does not prevent the network from establishing a new connection with another destination.

InterDigital agree with Xiaomi and think there is no issue from the network side.

Xiaomi agree with vivo’s reading that the upper layer is already guided to release the link.

OPPO wonder if the PC5 link can be maintained for a while when the indirect link has been released by the network, is the SRAP configuration invalid?

LG have the same understanding as Xiaomi and vivo that the release is triggered by upper layers.

Apple think the intention of the sentence is clear and the delay is intended to be temporary.

38.304 corrections

Proposal 2a: The 2nd change of replacing “for non L2 U2N Remote UE out-of-coverage” with “for out of coverage UE” to cover OoC remote UE when the frequency is included in sl-FreqInfoList in SIB12 in R2-2309516 is agreeable.

Discussion:

Ericsson are OK with the proposal, but they wonder what the wording originally meant. Nokia think it was just a mistake, but they think even with the correction, the paragraph is a little unclearly scoped (“is a remote UE” vs. “is acting as a remote UE”). Ericsson understand that the current text makes sense if decoded: If the UE acts as a remote UE, it has guidance from the text, and if not, SIB12 will not be taken into account. They are not sure “is a remote UE” vs. “is acting as a remote UE” is a clear distinction.

NEC think this may cause some ambiguity and the wording should be checked.

Proposal 2b: To discuss whether/how to clarify in TS38.304 that a Remote UE can use preconfiguration when the interested frequency is not included in SIB12, based on the 1st change and 3rd change in R2-2309516 as well as the proposals in R2-2310758.

Discussion:

Xiaomi think the scenario is not valid, because the relay UE will perform communication on the frequencies indicated by SIB12, so it would result in a mismatch between relay and remote.

Qualcomm think the proposal is confusing; they understand the intention is that if SIB12 does not provide any resources, the UE is allowed to use preconfiguration, and they think this is correct, but they are not sure if Nokia’s proposal is aligned with it.

Nokia wonder whether the UE is allowed to use preconfiguration in case of transmitting non-SL-relay-related data to other UEs; they think Xiaomi are correct that the mismatch scenario is not valid, but they are trying to distinguish between the relay and non-relay cases.

LG think the remote UE can assume when it receives SIB12, it is in coverage, and normally an in-coverage UE cannot use preconfiguration.

Xiaomi understand that relay and non-relay cases will always have different L2IDs, so Nokia’s concern should not apply.

InterDigital understand that if the UE is out of coverage or receives SIB12 from a relay, if the frequency information, the UE is by definition out of coverage on that frequency and allowed to use preconfiguration.

Qualcomm want to clarify whether we are discussing the case that SIB12 provides no frequency resources or only frequency resources in which the UE is not interested.

Ericsson understood that P2a is talking about a non-L2-relay UE in connection with a DRX configuration, and this is unrelated to P2b. For P2b, they think the concern is that an OOC remote UE that receives SIB12 from the relay UE would use the contents, but the same UE doing non-relay communication would use preconfiguration; they think the current spec is fine in this respect.

Nokia think we could keep the CR as is.

Qualcomm think we should clarify that if SIB12 provides any frequency resource, the UE is not allowed to use preconfiguration. Xiaomi wonder why SIB12 would be provided with no frequency information at all.

OPPO wonder if it is common understanding that for idle/inactive relay UEs, the UE will always follow SIB12 configuration, or if it may also use preconfiguration.

NEC think when the relay UE is in idle/inactive, it can operate as a legacy sidelink UE and operate inter-frequency.

vivo think we are close to convergence and we might be able to agree on the intended behaviour. OPPO have a different understanding on this aspect; they agree with NEC, and they wonder why the remote UE has to follow the SIB12 configuration if the relay UE does not.

Qualcomm would like to check this offline; they think there may be cases where the frequency is optional and the UE behaviour is unclear. Apple agree that more time to check would be useful.

* [AT123bis][419][Relay] Rel-17 relay 38.304 corrections (OPPO)

Scope: F2F offline to continue discussion of P2a/P2b of R2-2311261 and attempt to reach an agreeable way forward.

Intended outcome: Agreeable CR in R2-2311379 and report in R2-2311382

Deadline: Wednesday 2023-10-11 2000 CST

Schedule: Tuesday afternoon in Brk3 1430-1530

38.331 corrections

Proposal 3: The following changes to TS 38.331 are not pursued.

– The proposed changes in R2-2310035 and R2-2310036 for proactive PWS SIBs forwarding

– The proposed changes in R2-2310354 for sl-LocalID-Request in SUI

– The proposed changes in R2-2310701 for relay UE’s reconfiguration failure

Discussion:

Apple think the current text on sl-LocalID-Request has some problems and we need to do something, even if not identical to this proposal. Huawei think we need to clarify in RRC that it is only used for RRC\_CONNECTED remote UEs, and otherwise the paging info is needed.

Proposal 4: The following changes to TS 38.331 are agreeable. Can further check whether to have separate CRs or merge into one rapporteur CR.

– The changes in R2-2310493, and the 1st change in R2-2310599 of adding “PSSCH” before DMRS in clause 5.5.3.4, and the 3rd change in R2-2310035 of increasing the indent of “SL-SRAP-Config-r17” in subclause 6.3.5 are editorial, and can be merged into the rapporteur CR.

– In clause 5.3.7.3, a NOTE is added to clarify that a L2 U2N Relay UE may re-establish (e.g. via release and establish) the SL-RLC0 and SL-RLC1 of the connected L2 Remote UE(s) during RRC reestablishment procedure (R2-2310494)

– In clause 5.8.3.3 “or report other parameters related to U2N relay operation” is added after “if the UE initiates the procedure to request (configuration/ release) of NR sidelink U2N relay communication transmission resources” (based on the 4th change in R2-2310599)

– The proposed changes to the descriptions of event Y2 related parameters in R2-2310816

– In clause 5.3.5.16, “or received from RRCSetup message” is added at the end of “if sl-L2RemoteUE-Config is set to setup” (based on R2-2310838)

– In clause 5.8.3.2, “/ configured with measurement object associated to L2 U2N Relay UEs” is removed from discovery reception branch to discovery transmission branch (based on R2-2310600)

Discussion:

Lenovo think on the first item, it should not be restricted to PSSCH. Huawei understand that the measurement can only be based on PSSCH DMRS in the proposal, but they think PSCCH may also be valid.

vivo think on the second item, we should put it in a different section, because it is about the relay triggering re-establishment at the remote rather than a step of the relay’s own re-establishment procedure; they suggest the section on the notification message procedure. Lenovo agree and suggest section 5.3.7.3a.

Huawei think on the last bullet, it may be possible to avoid the SUI in case the network has provided a resource pool. OPPO think the SUI is still needed for the BSR in this case. Huawei wonder if it is needed for the Rx resource pool.

ZTE think the last bullet also applies to the communication resource request. Huawei think this applies only to measurement based on discovery.

ZTE think on the third bullet there are additional changes needed (third change from R2-2301599). Apple think the current text is correct. Huawei understand that the “either/or” case is covered by other bullets.

Agreements:

The following changes to TS 38.331 are not pursued.

– The proposed changes in R2-2310035 and R2-2310036 for proactive PWS SIBs forwarding

– The proposed changes in R2-2310354 for sl-LocalID-Request in SUI

– The proposed changes in R2-2310701 for relay UE’s reconfiguration failure

The following changes to TS 38.331 are agreeable and can be merged into one rapporteur CR.

– The changes in R2-2310493, and the 1st change in R2-2310599 of adding “PSSCH/PSCCH” before DMRS in clause 5.5.3.4, and the 3rd change in R2-2310035 of increasing the indent of “SL-SRAP-Config-r17” in subclause 6.3.5 are editorial, and can be merged into the rapporteur CR.

– In clause 5.3.7.3a, a NOTE is added to clarify that a L2 U2N Relay UE may re-establish (e.g. via release and establish) the SL-RLC0 and SL-RLC1 of the connected L2 Remote UE(s) during RRC reestablishment procedure (R2-2310494)

– In clause 5.8.3.3 “or report other parameters related to U2N relay operation” is added after “if the UE initiates the procedure to request (configuration/ release) of NR sidelink U2N relay communication transmission resources” (based on the 4th change in R2-2310599). Can discuss in CR drafting if something additional is needed.

– The proposed changes to the descriptions of event Y2 related parameters in R2-2310816

– In clause 5.3.5.16, “or received from RRCSetup message” is added at the end of “if sl-L2RemoteUE-Config is set to setup” (based on R2-2310838)

– In clause 5.8.3.2, “/ configured with measurement object associated to L2 U2N Relay UEs” is moved from discovery reception branch to discovery transmission branch (based on R2-2310600)

* [AT123bis][422][Relay] Rel-17 relay CR to 38.331 (Huawei)

Scope: Merge the agreed changes to 38.331 for Rel-17 relay into a rapporteur CR.

Intended outcome: Agreeable CR in R2-2311380

Deadline: Thursday 2023-10-12 2000 CST

R2-2311380 (CR from [422]) Huawei, HiSilicon CR Rel-17 38.331 17.6.0 4389 - F NR\_SL\_relay-Core

[R2-2311382](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Inbox\R2-2311382.zip) [AT123bis][419][Relay] Rel-17 relay 38.304 corrections (OPPO) OPPO discussion Rel-17 NR\_SL\_relay-Core

[From input to discussion, provided for reference]

Proposal 2a: The 2nd change of replacing “for non L2 U2N Remote UE out-of-coverage” with “for out of coverage UE” to cover OoC remote UE when the frequency is included in sl-FreqInfoList in SIB12 in R2-2309516 is agreeable.

[Proposals from this discussion]

P2a: intention agreeable, i.e., including the case for L2 U2N remote UE acquiring SL-DRX configuration from SIB/Preconfiguration, wording to be further checked.

P2b: R2 understand that sidelink carrier used for discovery/communication between L2 U2N remote and L2 U2N relay must be included in SIB12 of the cell of the relay UE.

Discussion:

OPPO clarify that the CR only includes P2a.

NEC wonder if the scenario of P2b is different from the V2X scenarios where SIB12 can be absent.

Qualcomm think P2b is not aligned with existing Rel-17 functionality, where the UE is allowed to use the frequency if it is not included in SIB12.

vivo have a similar understanding to Qualcomm: This would impose additional requirements for the relay functionality.

Huawei think the difference between L2 relay and V2X is the level of reliance on network configuration. They understand that in the current RRC spec, we emphasise that if there is no resource pool configured in SIB12, the remote UE cannot establish the RRC connection through the relay UE, and they see this as a similar situation.

Qualcomm think there is a misalignment between SA2/CT1/RAN2 understandings, and they would like to ask companies to clarify. They understand that 38.331 does not restrict the UE to use only the frequencies broadcasted in SIB12.

Ericsson wonder if the UE is in coverage and the network does not provide SIB12, whether the UE should use preconfiguration. Qualcomm understand yes under the current spec. Ericsson understand that in that case the network will not provide the needed information for, e.g., discovery.

LG think that in V2X, it is beneficial to use frequencies not listed in SIB12 because of the need to support OOC and cases where the network does not know the UEs’ situation, but for relaying there is a dependency on network operation.

NEC wonder if the network supports both relay and V2X, what happens if the network must provide the frequency in SIB12; does it mean there would be no preconfiguration case for V2X?

Apple think the gNB must provide some support for relaying, and if the gNB is not willing to provide a frequency, it is a strange corner case. Ericsson think from the network perspective, the remote UE may be OOC and need to rely on preconfiguration for non-relay communication.

OPPO understood that for companies who want to use preconfiguration, the SRAP and SLRB configuration have to come from dedicated RRC anyway, and it will lead to a strange mixture of configurations. They see the question as whether network vendors would like to enable this kind of combination.

Huawei think operators will want control of the frequencies where relaying occurs.

LG observe that the authorization mechanisms are different for V2X and relay, and if the network authorizes the UE for relay but does not provide a frequency, it looks like network permission to use a frequency not listed in the SIB, but they agree that it would be normal to provide the frequency.

Qualcomm understand that SA2 concluded the UE can use non-operator-managed frequencies, i.e., not in SIB12.

[R2-2311379](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\38304_CR0353_(REL-17)_R2-2311379%20-%20Correction%20on%20SIB%20and%20Preconfiguration%20applicability.docx) Correction on SIB/Preconfiguration applicability OPPO, ZTE CR Rel-17 38.304 17.6.0 0353 1 F NR\_SL\_enh-Core, NR\_SL\_relay-Core

* Agreed in principle

The following documents will not be individually treated

[R2-2309516](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\38304_CR0353_(REL-17)_R2-2309516%20-%20Correction%20on%20SIB%20and%20Preconfiguration%20applicability_V6.docx) Correction on SIB/Preconfiguration applicability OPPO, ZTE CR Rel-17 38.304 17.6.0 0353 - F NR\_SL\_enh-Core, NR\_SL\_relay-Core

* Revised in R2-2311379

[R2-2309918](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2309918_38.300_CR0713_Rel17_PC5%20unicast%20link%20release%20timing%20correction%20in%20indirect%20to%20direct%20path%20switch%20case.docx) PC5 unicast link release timing correction in indirect to direct path switch case MediaTek Inc CR Rel-17 38.300 17.6.0 0713 - F NR\_SL\_relay-Core

* Not pursued (companies can consider whether something is needed)

[R2-2310035](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\38331_CR4319_(Rel-17)_R2-2310035-Correction%20on%20the%20PWS%20SIB%20forwarding.docx) Correction on the PWS SIBs forwarding CATT CR Rel-17 38.331 17.6.0 4319 - F NR\_SL\_relay-Core

* Merged into R2-2311380

[R2-2310036](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2310036_Discussion%20on%20PWS%20handling%20in%20L2%20U2N%20Relay%20Scenario.docx) Discussion on PWS Handling in L2 U2N Relay Scenario CATT discussion Rel-17 NR\_SL\_relay-Core

* Noted

[R2-2310354](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2310354%2038331_R17_relay_Correction_lcoal%20ID%20request.docx) Correction on the inclusion of sl-LocalID-Request in SUI Apple CR Rel-17 38.331 17.6.0 4325 - F NR\_SL\_relay-Core

* Not pursued

[R2-2310493](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\38331_CR4331_(Rel-17)_R2-2310493%20Miscellaneous%20corrections%20for%20SL%20relay.docx) Miscellaneous corrections for SL relay Huawei, HiSilicon CR Rel-17 38.331 17.6.0 4331 - F NR\_SL\_relay-Core

* Merged into R2-2311380

[R2-2310494](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\38331_CR4332_(Rel-17)_R2-2310494%20SL-RLC0%20and%20SL-RLC1%20handling%20during%20L2%20Relay%20UE%20RRC%20reestablishment.docx) SL-RLC0 and SL-RLC1 handling during L2 Relay UE RRC reestablishment Huawei, HiSilicon CR Rel-17 38.331 17.6.0 4332 - F NR\_SL\_relay-Core

* Merged into R2-2311380

[R2-2310599](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\38331_CR4337_(Rel-17)_R2-2310599_Correction%20on%20SUI%20for%20sidelink%20relay.docx) Correction on SUI for sidelink relay ZTE, Sanechips CR Rel-17 38.331 17.6.0 4337 - F NR\_SL\_relay-Core

* Merged into R2-2311380

[R2-2310600](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2310600_Corrections%20on%20TS38.331%20for%20SL%20relay.docx) Correction on TS 388.331 for sidelink discovery ZTE, Sanechips CR Rel-17 38.331 17.6.0 4338 - F NR\_SL\_relay-Core

* Merged into R2-2311380

[R2-2310701](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2310701%20ReconfFailureR17.docx) Handling of Relay UE’s reconfiguration failure Nokia, Nokia Shanghai Bell discussion Rel-17 NR\_SL\_relay-Core

* Not pursued

[R2-2310758](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2310758%20Applicability%20of%20SIB12%20and%20preconfiguration.docx) Preconfiguration applicability in relay scenarios Nokia, Nokia Shanghai Bell discussion NR\_SL\_relay-Core

[R2-2310816](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2310816_38331_CR4352_(Rel-17)_RRC%20corrections%20for%20measurement%20reporting%20event%20Y2.docx) RRC corrections for measurement reporting event Y2 China Telecom, Huawei, HiSilicon CR Rel-17 38.331 17.6.0 4352 - D NR\_SL\_relay-Core

* Merged into R2-2311380

[R2-2310838](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Docs\R2-2310838.zip) Correction on sidelink relay RRC Philips International B.V. CR Rel-17 38.331 17.6.0 4353 - F NR\_SL\_relay-Core

* Merged into R2-2311380

[R2-2311220](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2311220%20-%2038.300_CR0719_Rel17_Correction%20on%20the%20SidelinkUEInformationNR%20message.docx) Correction on the SidelinkUEInformationNR message Ericsson CR Rel-17 38.300 17.6.0 0719 - F NR\_SL\_relay-Core

* Postponed

### 6.2.2 User plane corrections

A single CR per TS with miscellaneous corrections is encouraged. Small editorial corrections should be sent directly to the CR rapporteur for the corresponding spec. Larger open issues can be discussed with contributions (limited time).

[R2-2309685](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2309685_38351_CR0026_(REL-17)%20-Align%20terminology%20of%20PC5%20Relay%20RLC%20channel.docx) Align terminology of PC5 Relay RLC channel OPPO CR Rel-17 38.351 17.6.0 0026 - F NR\_SL\_relay-Core

* Not pursued

Discussion:

ZTE note that this terminology is also used in the stage 2 spec.

Huawei indicate that there is a definition in the RRC spec for “PC5 Relay RLC Channel”.

Apple think we do not need the CR. OPPO think this concern was expressed in Rel-18 and there is an attempt to align the Rel-17 spec with where we are going in Rel-18.

Apple understand that ingress and egress just define the direction of the channel, and the same channel concept can be used by both directions.

Samsung indicate that the definitions are there in 38.300, and they think the “egress” and “ingress” modifiers are clear.

[R2-2310353](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2310353%2038321_R17_relay_Correction_Destination_index.docx) Clarifications on the Destination Index usage in SL BSR Apple CR Rel-17 38.321 17.6.0 1680 - F NR\_SL\_relay-Core

* Postponed

Discussion:

NEC wonder if the MAC is the correct spec to add the first note, or if it should be in RRC with the SUI message.

Qualcomm wonder if there is a case in the second change where the L2IDs can be the same in different entries.

Nokia think the change is not essential since it only adds a NOTE, and they agree that maybe the first note should be in the RRC CR.

Huawei understand that the first change is already reflected in the RRC spec, and it should be clear that the total number does not exceed 32. For the second change, they have the same understanding as Qualcomm that the same L2ID can be reported twice in the signalling format, but the UE will not actually report it twice because the L2IDs for legacy and relay operation are different.

Apple understand that the RRC spec defines the max ID as 32, but they think it is not clear that the total limit is 32; they would be OK to clarify in either spec. On the second issue, they wonder about L2 vs. L3 relay and whether they can have the same L2ID. Huawei understand that the link will be established for one purpose: L2 or L3 or V2X, meaning that the L2ID will be different for different services.

Xiaomi think even if one UE supports L2 and L3, the ID will be different, as confirmed by LS from SA2 earlier. So they think the second change is not needed. For the first note, they think the RRC spec is already adequately clear.

ZTE also think L2 and L3 will have different L2IDs and RSCs.

Apple think on the first change, there is no restriction on the number of destinations from the UE perspective.

Ericsson wonder about the second note: Is the intention that the 32 entries will be filled with unique values by the network? If so, they understand that there is no issue either for the first or second note.

Huawei indicate that the number is for the UE reporting in the resource request, and there is no explicit network control; the maximum number is calculated by the UE and there may be some ambiguity. They are OK with the first NOTE proposed in the CR.

Xiaomi checked the SL BSR MAC CE, and the destination field is 5 bits, so it is intrinsically limited to 32.

Apple indicate there is such a note in the LTE MAC spec.

Ericsson are not clear what the problem is.

NEC think some clarification is needed about whether the UE should report no more than 32 destination IDs, or the network cannot generate more than 32 indices.

vivo think Ericsson’s point is valid and the clarification may not be needed.

InterDigital think there is some benefit to aligning with the LTE spec.

## 6.4 NR positioning enhancements

(NR\_pos\_enh-Core; leading WG: RAN1; REL-17; WID: [RP-210903](http://ftp.3gpp.org/tsg_ran/TSG_RAN/TSGR_91e/Docs/RP-210903.zip))

Tdoc Limitation: 2 tdocs

### 6.4.1 Stage 3 corrections

A single CR per TS (RRC, LPP, MAC, UEcap 306) with miscellaneous corrections is encouraged. Small editorial corrections should be sent directly to the CR rapporteur. Larger open issues can be discussed with contributions (limited time).

[R2-2310693](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2310693.docx) Correction of existing SSR IEs in A-GNSS for BDS system CATT, CAICT discussion Rel-17

[R2-2309609](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2309609_37355_CR0466_(Rel-17).docx) Correction of existing SSR IEs in A-GNSS for BDS system CATT, CAICT, CMCC, China Telecom, China Unicom, Huawei, ZTE Corporation, MediaTek Inc., OPPO, xiaomi, vivo, Spreadtrum CR Rel-17 37.355 17.6.0 0466 - F NR\_pos\_enh-Core

* Revised in R2-2311263

[R2-2311263](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2311263_37355_CR0466r1_(Rel-17)-revision%20of%20R2-2309609.docx) Correction of existing SSR IEs in A-GNSS for BDS system CATT, CAICT, CMCC, China Telecom, China Unicom, Huawei, ZTE Corporation, MediaTek Inc., OPPO, xiaomi, vivo, Spreadtrum CR Rel-17 37.355 17.6.0 0466 1 F NR\_pos\_enh-Core

* Revised in R2-2311572

Discussion:

Ericsson would like some more discussion, but they understand that this is for direct satellite distribution and not needed in LPP.

Nokia note that the coversheet indicates the fields are introduced because they are lacking in RTCM, so they see it as an enhancement rather than a correction.

CATT think it can be discussed offline, and they understand that if devices need to receive the signal from the satellite without the correction data, it increases the receiver cost.

Qualcomm agree with Ericsson and Nokia; they understand that the CR intends to apply the corrections to B1C, and they think this could be done with a simple flag applying the iod to B1C. They think the added fields are unnecessary and cannot be used by the UE, because it does not know which messages the LMF is using.

Swift agree with Ericsson and Qualcomm; they also have some concern about backward compatibility.

CATT would still prefer to use the new IEs; they think the server cannot provide the SSR corrections directly otherwise. Qualcomm agree this is true, but they think providing the correction for B1C ephemeris just requires the flag.

* [AT123bis][415][POS] BDS B1C corrections (CATT)

Scope: Discuss the proposed changes from R2-2311263 and determine if there is an agreeable way forward.

Intended outcome: Report to Thursday CB session in R2-2311372

Deadline: Wednesday 2023-10-11 2000 CST

[R2-2311372](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2311372%20Report%20of%20%5bAT123bis%5d%5b415%5d%5bPOS%5d%20BDS%20B1C%20correcttions%20(CATT).docx) Report of [AT123bis][415][POS] BDS B1C corrections (CATT) CATT discussion Rel-17

Proposal 1: Agree the revised CR in R2-2311572.

Proposal 2: Further discuss how to solve the backward compatibility in broadcast for the next meeting.

Discussion:

CATT indicate that several companies suggested a flag and capability for backward compatibility, which is reflected in the updated CR, allowing devices still to get the corrections for B1I.

Ericsson think more analysis is needed, and the situation could become unmanageable if corrections relative to different references are involved.

Swift think we should address the broadcast backward compatibility before agreeing a CR.

Intel think we can conclude that we use this approach for dedicated signalling.

Ericsson have concerns also for unicast if we support multiple references; the operator would need to prepare data for multiple references in parallel. Swift agree with Ericsson; they see value in the flexibility but think we need to address unicast and broadcast together.

CATT indicate there is a candidate solution for broadcast, but it impacts RRC. They think we could take the unicast correction in LPP now. They understand that the operator still has the option which reference(s) to support and the CR just defines the candidates.

CMCC indicate that there is a market requirement in China to support B1C users.

Intel understand that it addresses a case where B1I cannot be provided, which they think is unusual, but they think it is a real issue and CATT’s CR does address it correctly.

Ericsson are not opposed to the principle, but they think there has not been enough time to analyse the proposal.

Qualcomm understand the proposal is to continue working on the baseline towards the next meeting, and they agree we need to work towards a full solution but think a baseline would be useful.

Ericsson think the problem is real but there could be alternative solutions, and we should not fix a baseline now.

Agreement:

RAN2 acknowledge the need to make available BDS corrections in an environment where the available signal is B1C.

* [Post123bis][402][POS] BDS B1C corrections (CATT)

Scope: Discuss the proposal in R2-2311372 and develop a CR for next meeting, considering also the broadcast case.

Intended outcome: Agreeable CR

Deadline: Long

[R2-2311572](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2311572_37355_CR0466r2_(Rel-17).docx) Correction of existing SSR IEs in A-GNSS for BDS system CATT, CAICT, CMCC, China Telecom, China Unicom, Huawei, ZTE Corporation, MediaTek Inc., OPPO, xiaomi, vivo, Spreadtrum CR Rel-17 37.355 17.6.0 0466 2 F NR\_pos\_enh-Core

[R2-2309627](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2309627%20Correction%20to%20UE%20capability%20for%20batch%20reporting.docx) Correction to UE capability for batch reporitng Huawei, HiSilicon CR Rel-17 37.355 17.6.0 0470 - F NR\_pos\_enh-Core

* Postponed

[R2-2309919](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2309919%20Issue%20on%20dl-prs-ResourceSetPeriodicityReq-r17.docx) Issue on dl-prs-ResourceSetPeriodicityReq-r17 Samsung discussion Rel-17 NR\_pos\_enh-Core

[R2-2309920](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2309920_Addition%20of%20reference%20SCS%20for%20dl-prs-ResourceSetPeriodicityReq-r17.docx) Addition of reference SCS for dl-prs-ResourceSetPeriodicityReq-r17 Samsung CR Rel-17 37.355 17.6.0 0471 - F NR\_pos\_enh-Core

* Not pursued

Discussion:

vivo think the issue is valid, but they understand the LMF is aware of the SCS from the SSB of the serving cell, so they think it is enough to add a clarification of the interpretation of the SCS. Huawei agree, and they understand from RAN3 colleagues that the LMF can know the SCS.

ZTE think the LMF cannot know the current cell when the UE is in RRC\_INACTIVE; they see that an alternative solution would be to let the UE report the timing at ms granularity.

Ericsson think an LMF will not look into the value specifically for each UE, and they do not see that a correction is needed; they would be more comfortable with the clarification proposed by vivo.

OPPO agree with ZTE’s approach to include the time units in ms.

Samsung think vivo’s suggestion does not solve the problem, because in NRPPa the SCS information can include multiple values, and there could be ambiguity. As a compromise, they can accept indicating the timing in ms as suggested by ZTE.

Qualcomm think no change is needed; they would be OK with the suggestion from vivo, and they think the LMF needs to know the SCS.

Apple and Intel agree with Qualcomm and would be OK with vivo’s proposal.

Samsung think in vivo’s solution, there is no way for the LMF to indicate the SCS to a non-serving gNB.

ZTE think the UE should be able to report the time units as ms, which would avoid NRPPa impact because the LMF can send the gNBs the actual timing. CMCC agree with ZTE.

Intel understand that the parameters came from RAN1 and we should not change the timing without guidance from them.

OPPO think in vivo’s CR, it is not quite clear why the LMF is aware of the SSB; they would like some time to check offline.

CATT agree with vivo’s approach; they understand that the LMF can collect the SCS in the TRP information exchange.

Nokia think no additional signalling is needed, but a clarification would be OK.

[R2-2310545](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2310545%20Discussion%20on%20LocationMeasurementIndication%20procedure%20for%20positioning.docx) Discussion on LocationMeasurementIndication procedure for positioning ZTE Corporation discussion Rel-17 NR\_pos\_enh-Core

[R2-2310575](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2310575%20Correction%20on%20LocationMeasurementIndication%20procedure%20for%20positioning.docx) Correction on LocationMeasurementIndication procedure for positioning ZTE Corporation CR Rel-17 38.331 17.6.0 4336 - F NR\_pos\_enh-Core

Discussion:

Chair understands that this will result in triggering the stop procedure when the MAC CE has been triggered. Huawei have the same understanding and think the change is not correct.

Qualcomm think the existing text is confusing and the change is more logical; they see that the current text can lead to a situation where the stop is never sent.

Ericsson think we need to understand the motivation better. They think the idea is that if both legacy and preconfigured MGs are configured, the legacy gaps may never be stopped, and this might be an issue, but they agree with Huawei that cancelling the MAC CE should also stop the activation.

ZTE agree with Ericsson’s summary of the intention; they think the stop procedure is needed when the UE does not need to measure PRS any more.

vivo think the issue is valid, but some precondition is needed to prevent the stop from always being triggered.

Qualcomm think we made a mistake by mixing the preconfigured gap with the stop criteria; they understand that if there is a start there must be a stop, and with the current text, the stop may not happen.

Ericsson think we send a stop in the current text.

Huawei think the first change could be replaced by removing the list of examples.

ZTE indicate after some offline discussion, there is a view that the issue is valid but companies want some time to check the wording.

* [AT123bis][417][POS] LocationMeasurementIndication procedure (ZTE)

Scope: Check the wording for the issue raised in R2-2310575 and converge on an agreeable version.

Intended outcome: Agreeable CR in R2-2311377

Deadline: Wednesday 2023-10-11 2000 CST

[R2-2311377](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2311377%20Correction%20on%20LocationMeasurementIndication%20procedure%20for%20positioning.docx) Correction on LocationMeasurementIndication procedure for positioning ZTE Corporation, Ericsson CR Rel-17 38.331 17.6.0 4336 1 F NR\_pos\_enh-Core

* Agreed in principle

[R2-2310616](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2310616%20Clarification%20on%20the%20field%20description%20of%20dl-prs-ResourceSetPeriodicityReq.docx) Clarification on the field description of dl-prs-ResourceSetPeriodicityReq vivo draftCR Rel-17 37.355 17.6.0 F NR\_pos\_enh-Core

* Agreed in principle
* [AT123bis][416][POS] dl-prs-ResourceSetPeriodicityReq clarification (vivo)

Scope: Discuss the clarification proposed in R2-2310616 and determine if it is an acceptable way forward or if something else (e.g., explicit timing) is needed.

Intended outcome: Report to Thursday CB session in R2-2311373

Deadline: Wednesday 2023-10-11 2000 CST

[R2-2311373](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2311373%20Report%20of%20%5bAT123bis%5d%5b416%5d%5bPOS%5d%20SCS%20clarification.docx) Report of [AT123bis][416][POS] dl-prs-ResourceSetPeriodicityReq clarification vivo discussion Rel-18 NR\_pos\_enh-Core

Proposal 1: Adding clarification in the field description of dl-prs-ResourceSetPeriodicityReq, indicating that the μ refers to the SCS of SSB of target device’s current primary cell.

Proposal 2: R2-2310616 is agreed in principle.

[R2-2310644](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2310644%20Correction%20to%20activated%20measurement%20gap%20and%20PPW_final.docx) Correction to activated measurement gap and PPW Huawei, HiSilicon CR Rel-17 38.321 17.6.0 1685 - F NR\_pos\_enh-Core, NR\_MG\_enh-Core

* Not pursued

Discussion:

Ericsson think this is more of an editorial correction.

Huawei think if there are other MAC changes, we can merge with them, but this may be the only MAC change.

Intel agree it is editorial and should not be pursued.

ZTE agree with Intel.

[R2-2310851](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2310851%20PeriodicCR%20and%20HAGNSS.docx) Missing finer periodicities than 1s and HA GNSS Metrics field description correction Ericsson CR Rel-17 37.355 17.6.0 0474 - F NR\_pos\_enh-Core

* To be revised to include only the field description correction
* Revised in R2-2311378

Discussion:

Ericsson understand that without the change of periodicities, we cannot meet the finer latency requirements.

Qualcomm are not against the concept but do not see it as a correction. They understand that there are changes to the deferred MT-LR procedure in CT4 but do not see a connection to LPP.

Ericsson understand that the first report will be at the scheduled location time and the second according to the periodicity, so there is a connection between the two. Qualcomm agree but understand that the periodicity in question is configured in SS messages, not by LPP. They understand that in LTE and NR, periodic reporting is purely an SS feature.

OPPO are not sure where the requirement for this change comes from.

Intel think the latency requirement can be met without the change, so they agree with Qualcomm that it is an enhancement.

CATT note that the coversheet says Rel-18; they are OK with a Rel-18 change. They do not think RAT-independent positioning methods will be affected, because it targets IIoT.

vivo think the field description issue is valid; the current description is wrong.

Ericsson have a different understanding from Qualcomm on the relationship between periodic reporting and scheduled location time. They understand that the CT4 specs include sub-1s requests that we would not be able to handle; they expect an LS and think we could await that and discuss offline in the meantime. They also confirm that Rel-18 on the coversheet is a mistake, and they understand that it applies to both RAT-dependent and RAT-independent methods.

Qualcomm still think this is not a Rel-17 correction.

* [AT123bis][418][POS] Field description correction for HA-GNSS metrics (Ericsson)

Scope: Revise the CR in R2-2310851 to include only the field description correction and check the resulting CR.

Intended outcome: Agreed-in-principle CR (without CB if possible) in R2-2311378

Deadline: Wednesday 2023-10-11 2000 CST

[R2-2311378](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2311378%20Field%20description%20correction%20for%20HA-GNSS%20metrics.docx) Field description correction for HA-GNSS metrics Ericsson CR Rel-17 37.355 17.6.0 0474 1 F NR\_pos\_enh-Core

* Agreed in principle (email discussion [AT123bis][418])

[R2-2310909](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2310909_(TEG%20Capability).docx) Correction to UE TEG Capability Qualcomm Incorporated CR Rel-17 37.355 17.6.0 0475 - F NR\_pos\_enh-Core

* Agreed in principle

Withdrawn/Not available

R2-2310913 Updates for the consumption of posSIBs assistance data element Ericsson, Intel Corporation CR Rel-17 37.355 17.6.0 0476 - F NR\_pos\_enh-Core Withdrawn

### 6.4.2 Stage 2 corrections

A single CR with miscellaneous corrections is encouraged. Small editorial corrections should be sent directly to the CR rapporteur. This agenda item will be handled at lower priority.

[R2-2310997](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2310997%20posSIB.docx) Updates for the consumption of posSIBs assistance data element Ericsson, Intel Corporation, AT&T CR Rel-17 38.305 17.6.0 0147 - F NR\_pos\_enh-Core

* Not pursued

Discussion:

Samsung agree with the intention but have some concern with the last sentence; they think the UE cannot use the posSIB for standalone because by definition it does not involve network AD.

OPPO think a smart UE will only use proper AD for the positioning method and this could be left to implementation.

Qualcomm think this is not essential, but if it is wanted, the wording can be improved; it should be phrased from the UE point of view. They also think that the last sentences on standalone are not needed.

Huawei agree that it is not essential, because the UE and LMF will never have different understandings of the AD that the UE is using. For standalone mode, they think it is up to the UE what to do.

Ericsson indicate the main intention is that not all methods can be used standalone, and the UE should not be permitted to use non-standalone methods in a standalone way with the AD from the posSIBs.

Lenovo are not convinced that this is needed. If it is essential, they think it is essential from Rel-15, otherwise we should not have it in Rel-17 either.

CATT think it is clear in stage 2 which methods can be used standalone. Chair thinks a UE that tries to do DL-TDOA standalone is in violation of stage 2. Ericsson agree but think the requirements we have on the AD were written from a unicast point of view, and they agree with Lenovo that it could be introduced from Rel-15.

Ericsson think stage 2 indicates the supported positioning modes, but in their view it is not absolutely clear what is allowed with broadcast signalling since the requirements were written with dedicated signalling in mind. They think some clarification is needed but the wording could be discussed.

Qualcomm think from the UE point of view, there is no difference between AD received point-to-point or broadcast, and they do not think the change adds value. They are concerned that the CR could invite more corrections later.

Huawei agree with Qualcomm, and they wonder why the UE cannot do standalone DL-TDOA without the network’s knowledge.

Intel think since stage 2 only mentions standalone mode for the methods for which it is supported, it is not absolutely clear today.

Qualcomm think we do not say what is not supported, but for each method we mention the modes that are supported.

Withdrawn/Not available

R2-2310852 Updates for the consunmption of posSIBs assistance data element Ericsson, Intel Corporation CR Rel-17 38.305 17.6.0 0145 - F NR\_pos\_enh-Core Withdrawn

# 7 Rel-18

## 7.2 Expanded and improved NR positioning

(NR\_pos\_enh2; leading WG: RAN1; REL-18; WID: [RP-232670](http://ftp.3gpp.org/tsg_ran/TSG_RAN/TSGR_101/Docs/RP-232670.zip))

Time budget: 2 TU

Tdoc Limitation: 4 tdocs

### 7.2.1 Organizational

Including incoming LSs and rapporteur inputs.

Incoming LSs with RAN2 in Cc:

[R2-2309406](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2309406_C1-236562.docx) LS on LPP message and supplementary service event report over a user plane connection between UE and LMF (C1-236562; contact: Ericsson) CT1 LS in Rel-18 5G\_eLCS\_Ph3 To:SA2 Cc:SA3, RAN2, CT4

* Noted

Discussion:

Huawei wonder if we would need some stage 2 description related to CT1’s new specification. Qualcomm think there is no large impact but we might mention that the UP connection is supported.

Ericsson understand that this is still work in progress and not ready for us to capture anything.

[R2-2309452](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2309452_R4-2314357.docx) Reply LS on single measurement gap for DL PRS with Rx Hopping (R4-2314357; contact: Xiaomi) RAN4 LS in Rel-18 NR\_pos\_enh2-Core To:RAN1 Cc:RAN2

* Noted

[R2-2309477](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2309477_S2-2310025.docx) Reply LS on Reply LS on security aspects for Ranging/Sidelink Positioning (S2-2310025; contact: Xiaomi) SA2 LS in Rel-18 Ranging\_SL To:SA2 Cc:RAN2

* Noted

Incoming LSs with “take into account” action and no draft reply

[R2-2309409](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2309409_R1-2308349.docx) Reply LS on LPHAP (R1-2308349; contact: Huawei) RAN1 LS in Rel-18 NR\_pos\_enh2-Core To:RAN2 Cc:RAN3, RAN4

* Noted

[R2-2309419](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2309419_R1-2308559.docx) LS on Priority Handling for SL Positioning (R1-2308559; contact: Intel) RAN1 LS in Rel-18 NR\_pos\_enh2 To:RAN2

* Noted

[R2-2309423](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2309423_R1-2308571.docx) LS on the longer PRS/SRS periodicity for LPHAP (R1-2308571; contact: Huawei) RAN1 LS in Rel-18 NR\_pos\_enh2-Core To:RAN2, RAN3

Discussion:

Huawei think there are issues that need to be clarified, e.g., whether the longer periodicity is applicable for RRC\_INACTIVE, for MIMO SRS or only for positioning SRS, etc. They also see issues for the PRS-only TP. They think we will need to send RAN1 some questions.

Ericsson wonder if we can accommodate all the work coming from RAN1 without a lot of further discussion.

CATT do not think this will work in connected mode according to the WID; they think there is no agreement to have periodicity work for RRC\_CONNECTED. So they think there is no need to ask further questions.

OPPO think we did not discuss this before, and it is too late to open a new topic; they would prefer to exclude it.

Intel wonder why RAN1 left this out of the parameter list. They understand that we need some discussion to determine what values apply, and they think we could ask them to provide the needed values in the parameter list.

Qualcomm agree that this is a new topic, and they think it is not as simple as adding new values for periodicity, so they think RAN1 should figure out what the implications are instead of working on it in RAN2.

Intel think we could reply asking for the parameters.

Nokia understand that we are asked to come up with the values, so they understand that RAN1 will not provide them.

* [AT123bis][423][POS] LS to RAN1 on extended PRS/SRS periodicity (Huawei)

Scope: Draft an LS to RAN1 in reply to R2-2309423, indicating that RAN2 do not have enough information to define the signalling at this point, and requesting input via the parameter list.

Intended outcome: Approved LS (without CB if possible) in R2-2311386

Deadline: Thursday 2023-10-12 2000 CST

R2-2311386 (LS from [423]) Huawei LS out Rel-18 NR\_pos\_enh2-Core To:RAN1 Cc:RAN3

[R2-2309453](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2309453_R4-2314358.docx) LS on SL positioning and CPP measurements report mapping (R4-2314358; contact: CATT) RAN4 LS in Rel-18 NR\_pos\_enh2-Core To:RAN2, RAN3 Cc:RAN1

* Noted

[R2-2309454](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2309454_R4-2314360.docx) Reply LS on LPHAP (R4-2314360; contact: Huawei) RAN4 LS in Rel-18 NR\_pos\_enh2 To:RAN2 Cc:RAN1, RAN3

* Noted

LS on PRUs (handled in offline [402])

[R2-2309427](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2309427_R1-2308644.docx) Reply LS on PRU Procedures (R1-2308644; contact: CATT) RAN1 LS in Rel-18 NR\_pos\_enh2-Core, 5G\_eLCS\_Ph3 To:SA2, RAN2, RAN3 Cc:RAN4

Discussion:

CATT think there are some issues raised by the LS and we need to ask RAN1 for clarification.

Nokia see some relation to the discussion on impacts from RAN1-led items.

Other incoming LSs and draft replies from contact company

[R2-2309428](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2309428_R1-2308646.doc) LS on TRP ID for positioning with bandwidth aggregation (R1-2308646; contact: ZTE) RAN1 LS in Rel-18 NR\_pos\_enh2 To:RAN2

* Noted

Discussion:

ZTE understand that a reply is needed, but it depends on our discussion under the RAN1-led AI. Intel agree with ZTE.

Qualcomm think no reply is needed and we can just capture the requested functionality.

Huawei think the LS is a bit confusing; they recall a Rel-16 agreement from RAN1 that the DL-PRS ID is used to identify a configuration. So would there be Rel-16 impact?

CATT have a different understanding from what is in the LS, so they think some discussion is needed to reach a common understanding. Qualcomm think there is no problem in this respect, and the deployment just needs to make sure that the PRS resource can be identified. They think we can just add a note in our spec that the aggregated resources have to come from different PFLs.

ZTE agree with RAN1’s interpretation, and they think we do not use DL-PRS ID in the bandwidth aggregation signalling. If a reply is needed, we can just indicate the wording of our note.

Huawei agree with Qualcomm that it can be resolved with a note in our spec.

CATT think the impact to us is just a note about how to capture the associated resource ID, and for the understanding of the resource set, they think we do not need to discuss the resource set ID, but we may need to clarify the usage of the IDs and send a reply to RAN1, or it may be enough just to capture the agreement.

Intel agree with Qualcomm and Huawei and think no reply is needed.

Qualcomm think it is not trivial to add the note to the original baseline. We need to define the linkage information in a way that is independent of how a deployment allocates IDs.

Apple agree that a note is sufficient.

Nokia understand that the note would be a clarification from the bandwidth aggregation point of view, not generally disambiguating how to interpret the DL-PRS ID.

Agreement:

Capture as a NOTE in the running LPP CR for bandwidth aggregation that the resources aggregated across PFLs should be from the same TRP. Wording of the NOTE to be resolved in CR email discussion.

[R2-2309429](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2309429_R1-2308649.docx) LS on RSRP based TA validation for LPHAP (R1-2308649; contact: Huawei) RAN1 LS in Rel-18 NR\_pos\_enh2-Core To:RAN2

Discussion:

Huawei understand that we need to discuss the second issue where RAN1 were unable to reach consensus.

CATT think it is out of RAN2 scope and there is no RAN2 spec impact; the reference signal should be designed by RAN1. We capture the pathloss computation, not which signal is used. Huawei understand that it is captured in the RRC spec; they think we should avoid ping-pong.

ZTE agree with Huawei that it should be solved in RAN2, and they think Huawei’s draft LS is a good answer.

Samsung agree with Huawei, and think the interpretation is fairly clear.

vivo agree it should be resolved in RAN2, but they think the RS should belong to the last cell, not the incoming cell. If the UE updates the TA according to the new cell where it camps, it should update the RS as well.

Xiaomi think the UE should compare with the RSRP from the current cell.

Intel think we are repeating the RAN1 discussion a bit; there are different scenarios where the last cell and the current cell seem to make sense.

CMCC think the last serving cell is a reasonable approach considering the area-valid TA.

Ericsson think we could pass the question to RAN4. Huawei think RAN4 will not define the procedure, only requirements, and the question is not well suited.

OPPO think it depends also on the cell coverage; if the coverage of the last serving cell is small, it is difficult for the UE to derive the TA based on that cell.

Intel agree that RAN4 may be a better group to handle the underlying requirement; we do not know which option will provide the best performance. Apple agree with Intel and do not see how RAN2 can resolve this.

Nokia note that one of the options in the LS already says “if confirmed by RAN4” (but RAN4 were not in Cc: on the LS). Huawei understand that RAN2 do not need to discuss that part.

* [AT123bis][424][POS] LS to RAN1/RAN4 on TA validation for LPHAP (Huawei)

Scope: Draft a reply to R2-2309429, including RAN4 to ask for their input on the expected performance of the options. Discussion can try to establish consensus within RAN2, but in any case RAN4 should be asked for their view.

Intended outcome: Approvable LS in R2-2311387 and report to Friday CB session in R2-2311388

Deadline: Thursday 2023-10-12 2000 CST

R2-2311388 (Report of [424]) Huawei discussion Rel-18

R2-2311387 (LS from [424]) Huawei LS out Rel-18 NR\_pos\_enh2-Core To:RAN1,RAN4

[R2-2309637](C:\\Users\\mtk16923\\Documents\\3GPP Meetings\\202310 - RAN2_123bis, Xiamen\\Extracts\\R2-2309637 Draft reply LS on LPHAP TA validation_v00.doc" \o "C:\Users\mtk16923\Documents\3GPP Meetings\202310 - RAN2_123bis, Xiamen\Extracts\R2-2309637 Draft reply LS on LPHAP TA validation_v00.doc) Draft reply LS on LPHAP TA validation Huawei, HiSilicon discussion Rel-18 NR\_pos\_enh2 To:RAN1

[R2-2309430](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2309430_R1-2308651.docx) LS on the resource selection window for Scheme 2 in a dedicated resource pool for positioning (R1-2308651; contact: Qualcomm) RAN1 LS in Rel-18 NR\_pos\_enh2 To:RAN2 Cc:SA2

Discussion:

Qualcomm think we can confirm RAN1’s WA.

Huawei think it should be the delay rather than the PDB, as we do not have the PQI; as to how the delay budget can be achieved, they understand we already sent an LS to SA2 asking about this. They agree we can confirm the WA.

Qualcomm are not sure there needs to be QoS for the SL-PRS, and it would involve SA2 work to support it. They understand the delay budget is more related to the positioning QoS and should come from the UE’s upper layer, i.e., SLPP.

Qualcomm understand this is already covered in the MAC CR for further discussion, and they would like to avoid involving SA2.

Huawei wonder about including priority in the MAC CE.

OPPO think we should indicate that RAN1 should wait for SA2 decision also.

Ericsson think we could wait for one meeting.

Intel do not see an issue with confirming the WA.

* [AT123bis][425][POS] LS to RAN1 on resource allocation window for scheme 2 (Qualcomm)

Scope: Draft a reply to R2-2309430 (keeping SA2 in Cc:) indicating that RAN2 confirm RAN1’s WA.

Intended outcome: Approved LS (without CB if possible) in R2-2311389

Deadline: Thursday 2023-10-12 2000 CST

R2-2311389 (LS from [425]) Qualcomm Incorporated LS out Rel-18 NR\_pos\_enh2-Core To:RAN1

[R2-2309474](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2309474_S2-2309926.docx) Response LS to RAN WG2 on reporting positioning measurements taken in RRC\_IDLE (S2-2309926; contact: CATT) SA2 LS in Rel-18 NR\_pos\_enh2, 5G\_eLCS\_Ph3 To:RAN2 Cc:RAN1

* Noted

[R2-2309597](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2309597%20Reply%20LS%20to%20SA2%20on%20reporting%20positioning%20measurements%20taken%20in%20RRC_IDLE.docx) Reply LS to SA2 on reporting positioning measurements taken in RRC\_IDLE CATT LS out Rel-18 NR\_pos\_enh2, 5G\_eLCS\_Ph3 To:SA2

* Approved as R2-2311381

[R2-2309465](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2309465_R4-2314483.docx) LS on PRS/RRM measurement when eDRX cycle > 10.24s (R4-2314483; contact: Ericsson) RAN4 LS in Rel-18 NR\_pos\_enh2-Core To:RAN2

* Noted

Discussion:

Ericsson understand that RAN4 are working based on assumptions that may need checking.

Huawei think no immediate action is needed from RAN2 perspective; RAN4 are trying to decouple RRM measurements and positioning measurements, and the intention of the LS is to update us and clarify that no RAN2 solution to this issue is needed.

Qualcomm think Ericsson’s question is whether RAN4 are aware of what we are doing on PRS/DRX alignment; if the RAN4 requirements force measuring outside the DRX active period, there may be no gain from alignment.

Intel understand PRS/DRX alignment will be optional, so measurement outside the active period may be needed. They also do not see immediate action from RAN2.

CATT think there will be impact to the LPP running CR, which can be discussed in the CR drafting, but they do not see a need to reply to RAN4; we can just take the LS into account. They see impact to UE-initiated on-demand PRS or PRS alignment with eDRX. Qualcomm understand that the PPW is only involved in connected mode. CATT think the PTW works in inactive mode.

Huawei do not see that RAN4 mention on-demand PRS, and whether these features can work together can be discussed in the future.

[R2-2311265](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2311265%20LS.docx) LS on PRS/RRM measurement when eDRX cycle > 10.24s Ericsson LS out Rel-18 NR\_pos\_enh2 To:RAN4

Work plan

[R2-2309596](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2309596%20Work%20Plan%20for%20Rel-18%20WI%20on%20Expanded%20and%20Improved%20NR%20Positioning.docx) Work Plan for Rel-18 WI on Expanded and Improved NR Positioning CATT, Intel Corporation, Ericsson Work Plan Rel-18

* Noted

Draft reply on PRUs

[R2-2309598](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2309598%20%5bDraft%5dReply%20LS%20on%20Reply%20LS%20on%20PRU%20Procedures.doc) [Draft]Reply LS on Reply LS on PRU Procedures CATT LS out Rel-18 NR\_pos\_enh2 To:RAN1 Cc:RAN3, RAN4, SA2

* [AT123bis][402][POS] PRUs (CATT)

Scope: Email to discuss the incoming LS in R2-2309427 and draft reply in R2-2309598, along with the contributions in R2-2310854 and R2-2310920 and P1 of R2-2309608, reply and evaluate the RAN2 impact for PRU support.

Intended outcome: Reply LS in R2-2311375 and report to Thursday CB session in R2-2311376

Deadline: Wednesday 2023-10-11 1900 CST

[R2-2311376](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2311376%20Report%20of%20%5bAT123bis%5d%5b402%5d%5bPOS%5d%20PRUs%20(CATT).docx) Report of [AT123bis][402][POS] PRUs (CATT) CATT discussion Rel-18

Proposal 1: Send an rely LS to RAN1 including below questions:

 Question 1: Can the associated resource ID and resource Set ID in the report of RSCPD be different from the associated resource ID and resource Set ID in RSTD when UE report these measurements? The same question applies to RSCP and UE Rx-Tx time difference report.

 Question 2: If answer of Q1 is yes, is the LOS/NLOS indication associated with the resource of RSCPD also required?

 Question3: For DL-TDOA, UE may provide up to 3 additional RSTD measurements per pair of TRPs. For CPP, is there any additional RSCP measurement per TRP or additional RSCPD measurement per pair of TRPs?

 Question4: On the indicated DL PRS resource set(s) occurring within indicated time window(s), is each indicated DL-PRS resourceSet associated with one indicated time window or multiple time windows?

Proposal 2: TP of PRU for TS 38.305 won’t be captured.

Proposal 3: Endorsed the TP in R2-2310854 as baseline into LPP running CR and add the clarification: It should be declared that the new location type only applies to PRUs.

Discuss and address the concern:

- A specific request would lead to wrong PRU behaviour/operation. It is not needed and would imply that in absence of an explicit request, the PRU would be allowed to provide the location measurements without the location coordinates where the measurements are valid.

- A Note for clarification can be added to address concern that the location is based on the measurement:

Note: For PRU, if PRU is requested to return both location estimate and measurements, the location information is determined independently of the reported measurements.

Discussion:

Qualcomm can accept a request for location+measurements, but they are not OK with the way it is proposed in the TP by extending the location mode. They understand it should be a new IE, not mixed with UE-based/UE-assisted. They also see some overhead in the explicit request.

Ericsson note that the PRU itself might move, so its position will still be an estimate, just not related to the provided measurements. So they think the existing TP is all right as it is.

Qualcomm think this is just an ASN.1 structural issue and not dependent on whether the location is considered as an “estimate” or not.

Apple agree with Qualcomm and think that whether it is an estimate or not, this is something different from the legacy modes.

Ericsson suggest taking the current TP as baseline and discussing alternatives under the running CR.

Qualcomm think we could agree that the request is a separate IE. Ericsson want to see a TP before agreeing to it.

Qualcomm note that the PRU topic emerged from SA2 and is somewhat outside our WI. CATT observe that it is used for CPP and there are related agreements from RAN1.

OPPO think the word “positioning” needs to be added in the TP in one place. Can be checked in the running CR.

Agreements:

TP from R2-2310854 can be migrated into the LPP running CR.

FFS exact IE structure of the request for location+measurements.

A Note for clarification can be added to address concern that the location is based on the measurement:

Note: For PRU, if PRU is requested to return both location estimate and measurements, the location information is determined independently of the reported measurements.

[R2-2311375](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2311375%20Reply%20LS%20on%20R1-2308644%20for%20CPP.doc) Reply LS on R1-2308644 for CPP CATT LS out Rel-18 NR\_pos\_enh2 To:RAN1 Cc:RAN3, RAN4, SA2

* Revised in R2-2311565 (add SA2 in Cc:)

[R2-2311565](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2311565%20Reply%20LS%20on%20R1-2308644%20for%20CPP.doc) Reply LS on R1-2308644 for CPP CATT LS out Rel-18 NR\_pos\_enh2 To:RAN1 Cc:RAN3, RAN4, SA2

* Approved

Other draft replies

[R2-2309599](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2309599%20Reply%20LS%20on%20TRP%20ID%20for%20positioning%20with%20bandwidth%20aggregation.doc) Reply LS on TRP ID for positioning with bandwidth aggregation CATT LS out Rel-18 NR\_pos\_enh2 To:RAN1

Running CRs

[R2-2309600](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2309600%20LPP%20running%20CR%20for%20LPHAP.docx) LPP running CR for LPHAP CATT draftCR Rel-18 37.355 17.6.0 B NR\_pos\_enh2

* Merged into R2-2311399

[R2-2309601](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2309601%20LPP%20running%20CR%20for%20Carrier%20Phase%20Positioning.docx) LPP running CR for Carrier Phase Positioning CATT draftCR Rel-18 37.355 17.6.0 B NR\_pos\_enh2

* Revised in R2-2311397

[R2-2309602](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2309602%20LPP%20running%20CR%20for%20bandwidth%20aggregation.docx) LPP Running CR for bandwidth aggregation CATT draftCR Rel-18 37.355 17.6.0 B NR\_pos\_enh2

* Revised in R2-2311398

[R2-2309603](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2309603%20LPP%20running%20CR%20for%20RAT-dependent%20integrity.docx) LPP running CR for RAT-dependent integrity CATT draftCR Rel-18 37.355 17.6.0 B NR\_pos\_enh2

* Revised in R2-2311396

[R2-2309604](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2309604%20LPP%20running%20CR%20for%20Redcap%20Positioning.docx) LPP Running CR for Redcap positioning CATT draftCR Rel-18 37.355 17.6.0 B NR\_pos\_enh2

* Merged into R2-2311399

[R2-2309632](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2309632%20Draft%20running%20MAC%20CR%20for%20LPHAP_final.docx) Running MAC CR for LPHAP Huawei, HiSilicon draftCR Rel-18 38.321 17.6.0 NR\_pos\_enh2

[R2-2309633](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2309633%20Draft%20running%20MAC%20CR%20for%20sidelink%20positioning_final.docx) Running MAC CR for Sidelink Positioning Huawei, HiSilicon draftCR Rel-18 38.321 17.6.0 NR\_pos\_enh2

* Revised in R2-2311551

[R2-2309635](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2309635%20Draft%20Running%20MAC%20CR%20for%20CA%20positioning_final.docx) Running MAC CR for CA positioniing Huawei, HiSilicon draftCR Rel-18 38.321 17.6.0 NR\_pos\_enh2

[R2-2309636](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2309636%20Draft%20Running%20MAC%20CR%20for%20REDCAP%20positioning_final.docx) Running MAC CR for REDCAP positioning Huawei, HiSilicon draftCR Rel-18 38.321 17.6.0 NR\_pos\_enh2

[R2-2309667](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2309667%20Running%2038300%20CR%20for%20sidelink%20positioning.docx) Running 38300 CR for sidelink positioning vivo discussion Rel-18 FS\_NR\_pos\_enh2

* Revised in R2-2311555

[R2-2310860](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2310860%20SLRRC.docx) Rapporteur CR for Sidelink Positioning RRC Changes Ericsson discussion Rel-18

* Merged into R2-2311552

[R2-2310861](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2310861%20CPP.docx) Rapporteur CR for CPP Positioning RRC Changes Ericsson draftCR Rel-18 38.331 17.6.0 B NR\_pos\_enh2

* Merged into R2-2311552

[R2-2310862](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2310862%20recap.docx) Rapporteur CR for Redcap Positioning RRC Changes Ericsson draftCR Rel-18 38.331 17.6.0 B NR\_pos\_enh2

* Merged into R2-2311552

[R2-2310863](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2310863%20BWA.docx) Rapporteur CR for bandwidth aggregation Ericsson draftCR Rel-18 38.331 17.6.0 B NR\_pos\_enh2

* Merged into R2-2311552

[R2-2310911](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2310911_(Running%20Stage%202%20CR)_v02.docx) Running Stage 2 CR for 'Expanded and improved NR positioning' Qualcomm Incorporated draftCR Rel-18 38.305 17.6.0 B NR\_pos\_enh2

* Revised in R2-2311554

[R2-2310980](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2310980%20Running%20CR%20for%20RRC.docx) Running CR for Positioning Ericsson draftCR Rel-18 38.331 17.6.0 B NR\_pos\_enh2

* Merged into R2-2311552
* [AT123bis][403][POS] LPP CRs (CATT)

Scope: Check and update the Rel-18 positioning CRs to 37.355.

Intended outcome: Endorsable CRs and summary as follows:

R2-2311396 (integrity)

R2-2311397 (CPP)

R2-2311398 (BW aggregation)

R2-2311399 (others)

R2-2311550 (summary)

Deadline: Thursday 2023-10-12 2000 CST

R2-2311550 (Report of [403]) CATT discussion Rel-18

R2-2311396 LPP running CR for RAT-dependent integrity CATT draftCR Rel-18 37.355 17.6.0 B NR\_pos\_enh2

R2-2311397 LPP running CR for Carrier Phase Positioning CATT draftCR Rel-18 37.355 17.6.0 B NR\_pos\_enh2

R2-2311398 LPP Running CR for bandwidth aggregation CATT draftCR Rel-18 37.355 17.6.0 B NR\_pos\_enh2

R2-2311399 (CR from [403]) CATT draftCR Rel-18 37.355 17.6.0 B NR\_pos\_enh2

* [AT123bis][404][POS] Positioning MAC CRs (Huawei)

Scope: Check and update the Rel-18 positioning CRs to 38.321.

Intended outcome: Endorsable CRs and summary:

R2-2311551 (sidelink positioning)

R2-2311563 (LPHAP)

R2-2311564 (summary)

Others TBD if revisions are needed

Deadline: Thursday 2023-10-12 2000 CST

R2-2311551 Running MAC CR for Sidelink Positioning Huawei, HiSilicon draftCR Rel-18 38.321 17.6.0 NR\_pos\_enh2

* [AT123bis][405][POS] Positioning RRC CRs (Ericsson)

Scope: Check and update the Rel-18 positioning CRs to 38.331.

Intended outcome: Endorsable CR and summary:

R2-2311552 (merged RRC CR)

R2-2311553 (summary)

Deadline: Thursday 2023-10-12 2000 CST

R2-2311553 (Report of [405]) Ericsson discussion Rel-18

R2-2311552 Running CR for Positioning Ericsson draftCR Rel-18 38.331 17.6.0 B NR\_pos\_enh2

* [AT123bis][406][POS] Positioning 38.305 CR (Qualcomm)

Scope: Check and update the Rel-18 positioning CR to 38.305.

Intended outcome: Endorsable CR in R2-2311554

Deadline: Thursday 2023-10-12 2000 CST

R2-2311554 Running Stage 2 CR for 'Expanded and improved NR positioning' Qualcomm Incorporated draftCR Rel-18 38.305 17.6.0 B NR\_pos\_enh2

* [AT123bis][407][POS] Positioning 38.300 CR (vivo)

Scope: Check and update the Rel-18 positioning CR to 38.300.

Intended outcome: Endorsable CR in R2-2311555

Deadline: Thursday 2023-10-12 2000 CST

R2-2311555 Running 38300 CR for sidelink positioning vivo discussion Rel-18 FS\_NR\_pos\_enh2

TS 38.355

[R2-2310218](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2310218%20SLPP%20considerations.docx) Further considerations on SLPP specification Intel Corporation discussion Rel-18 NR\_pos\_enh2

[R2-2310219](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2310219%2038.355%20TP%20on%20SLPP%20sessino%20handling.docx) TS38.355 TP on SLPP session and session procedure Intel Corporation discussion Rel-18 NR\_pos\_enh2

[R2-2310220](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2310220%2038.355%20TP%20on%20ASN1.docx) TS38.355 TP on ASN.1 part Intel Corporation discussion Rel-18 NR\_pos\_enh2

R2-2310221 TS38.355 TP on SLPP procedure Intel Corporation discussion Rel-18 NR\_pos\_enh2

[R2-2310222](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Docs\R2-2310222.zip) TS 38.355 v1.1.0 Intel Corporation draft TS Rel-18 38.355 1.1.0 NR\_pos\_enh2

UE capabilities

[R2-2310444](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2310444%20Discussion%20on%20R18%20positioning%20UE%20capabilities_V2.doc) Discussion on R18 positioning UE capabilities Beijing Xiaomi Mobile Software discussion Rel-18

RAN1 feature list

Proposal 1 RAN2 to confirm the understanding that all the SL positioning features in RAN1 feature list (except 41-1-7, for which is FFS) are common capabilities for all SL positioning methods.

RAN2 feature list

Sidelink positioning

Proposal 2 Support capability signalling of positioning modes(i.e. UE based, UE assisted) per positioning method (SL-TDOA, SL-AOA, SL-RTT) in SLPP.

Proposal 3 Support capability signalling of periodical positioning per positioning method (SL-TDOA, SL-AOA, SL-RTT) in SLPP.

Proposal 4 No trigger event is defined for SL positioning methods(SL-TDOA, SL-AOA, SL-RTT) and no capability signalling is needed.

Discussion:

Intel see that these proposals interact with the structure of SLPP, so the definitions may not exactly be per positioning method.

LPHAP

Proposal 5 The UE capability on UE supporting SRS request by RRC message should be defined.

Proposal 6 The UE capability on UE supporting preconfigured SRS should be defined.

Proposal 7 FFS whether the UE capability on UE supporting alignment of PRS to fixed (e)DRX should be defined.

Discussion:

Xiaomi indicate that the intention includes allowing companies to check the included feature list proposals.

* [AT123bis][426][POS] Rel-18 positioning capabilities (Xiaomi)

Scope: Check the proposed RAN2 positioning capabilities in R2-2310444 and progress towards readiness for a draft CR next meeting.

Intended outcome: Report to Friday CB session in R2-2311390

Deadline: Thursday 2023-10-12 2000 CST

R2-2311390 (Report of [426]) Beijing Xiaomi Mobile Software discussion Rel-18

Withdrawn/Not available

R2-2310864 Running RRC CR for Positioning Ericsson CR Rel-18 38.331 17.6.0 4355 - B NR\_pos\_enh2 Withdrawn

### 7.2.2 Sidelink positioning

Positioning architecture and unicast signalling procedures (e.g. configuration, measurement reporting, etc) to enable session-based sidelink positioning for a single target UE. Including measurements to enable RTT-based positioning, SL-AoA, and SL-TDOA; signalling and associated UE behaviour for support of unicast, groupcast (not including many-to-one) and broadcast of SL-PRS transmissions; reporting signalling and procedures to facilitate support of SL positioning between UEs and between UEs and LMF (the latter for in-coverage scenarios only and including joint PC5-Uu scenarios, and with the assumption that all UEs are served by the same LMF); and signalling to NG-RAN for SL positioning and service authorization as needed. No work on procedures for synchronization of the anchor UEs for SL-TDOA.

Including report of [Post123][401][POS] RAN2 impact from SL-PRS parameters (Intel)

Including report of [Post123][403][POS] Sidelink positioning MAC issues (Huawei)

Email discussion reports

[R2-2310216](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2310216.docx) Report of [Post123][401][POS] RAN2 impact from SL-PRS parameters (Intel) Intel Corporation discussion Rel-18 NR\_pos\_enh2

Proposal 1: RAN2 confirms that the RAN1 provided SL-PRS related parameters correspond specifically to the dedicated SL-PRS resource pools.

Discussion:

ZTE think no formal agreement is needed because RAN1 will in any case update the parameter list.

Proposal 2: The configuration of SL-PRS related parameters to the UE shall follow the same principle as SL communication, i.e. rely on NW/gNB for in coverage and pre-configuration for out of coverage case.

Discussion:

ZTE wonder if it excludes the case that the server UE provides the parameters to the Tx UE in OOC. Intel understand that for an OOC UE. Qualcomm think this is about the distinction between SL-PRS configuration and resources; they do not think we can signal the resources from the server UE. vivo agree with Qualcomm; they think some SL-PRS parameters like sequence ID (in P4) could be provided from the server UE.

Proposal 3: For configuration of SL-PRS dedicated pool, agree to reuse the existing signaling for a given SL resource pool (i.e. SL-ResourcePool) and define any new SL-PRS related parameters as needed within. The associated TP provided in the annex can be used as a starting point.

Discussion:

Intel indicate the point is to keep the existing signalling and potentially add new IEs at lower level where needed.

Qualcomm would prefer using a new IE and not mixing it with sidelink communication generally. They think a new SL-PRS-ResourcePool might be cleaner.

OPPO agree with Intel; provided the existing signalling IEs are OPTIONAL, we can just add new ones.

Huawei understand the RAN1 parameter list will address this.

Lenovo and Apple agree with Qualcomm and prefer a new IE.

Intel consider that we could follow the principle of discovery and use the existing pool format, with the expectation that RAN1 will add more parameters that overlap with the existing format.

Proposal 4: RAN2 discuss whether the SL-PRS sequence ID shall be provided to the TX UE by the LMF/Server UE (via SLPP signaling) or determined by TX UE itself.

Discussion:

vivo think either way can work, and they think the server could provide it to the Rx UE(s); they think it is in RAN2 scope to decide.

Ericsson understand that RAN1 agreed the Tx UE can determine the sequence ID by itself. They would like to keep both options. OPPO also want to keep both options.

Nokia wonder if we are giving the transmitter too much power to override the server UE decision. Intel think the solution from some companies is to allow the server to override the Tx UE’s sequence ID.

OPPO think the Tx UE should be able to select its own sequence ID even if the server requested a different one.

Proposal 7: SLPP signaling for SL positioning measurement reporting can be defined using the associated IE structure within ProvideLocationInformation IE in LPP as baseline. The signaling included in the Annex can be used as a starting point by SLPP specification rapporteur.

Proposal 9: RAN2 is proposed to discuss the following aspects as part of capturing the SL Positioning measurement related parameters in the SLPP specification:

- Whether to capture UE location related information in SLPP (or rely on existing LPP to carry it)?

Proposal 10: Agree that for the case of absolute SL positioning, the following can be said about the anchor UE’s absolute location:

- For Network based operation (UE assisted), the anchor UE location shall be provided to the LMF

- For Network assisted operation (UE based/network assisted), the anchor UE location shall be provided to the UE

- For UE only operation, the anchor UE location shall be provided to the server UE

Proposal 11: For the case of UE-based positioning, Server UE provides the anchorUE-location-Information of anchor UEs to the target UE via SLPP ProvideAssistanceData signaling. FFS whether we need to consider the case of no server UE or when it is collocated with the target UE.

Agreements:

The configuration of SL-PRS resource pool to the UE shall follow the same principle as SL communication, i.e. rely on NW/gNB for in coverage and pre-configuration for out of coverage case.

The SL-PRS sequence ID can be provided to the TX UE by the LMF/Server UE (via SLPP signalling). If the Tx UE does not receive a sequence ID via SLPP message from the server, the Tx UE is expected to select one by itself. FFS exact SLPP signalling.

For absolute sidelink positioning, the locations of the anchor UEs are provided to the entity that does the location calculation.

[R2-2309634](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2309634%20Summary%20of%20%5bPost123%5d%5b403%5d%5bPOS%5d%20Sidelink%20positioning%20MAC%20issues%20(Huawei).docx) Summary of [Post123][403][POS] Sidelink positioning MAC issues (Huawei) Huawei, HiSilicon discussion Rel-18 NR\_pos\_enh2

* [AT123bis][428][POS] Discussion of SL positioning MAC issues (Huawei)

Scope: Discuss the proposals in R2-2309634 and agree where possible.

Intended outcome: Report to Thursday CB session in R2-2311383

Deadline: Thursday 2023-10-12 1200 CST

Schedule: Wednesday 2023-10-11 0830-1000 CST, in Brk3

[R2-2311383](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2311383%20Summary%20of%20%5bAT123bis%5d%5b428%5d%5bPOS%5d%20Discussion%20of%20SL%20positioning%20MAC%20issues%20(Huawei).docx) Summary of [AT123bis][428][POS] Discussion of SL positioning MAC issues (Huawei) Huawei, HiSilicon discussion Rel-18 NR\_pos\_enh2

Agreements:

Support the following at least the following contents within the MAC CE for SL-PRS resource request: FFS whether both of them can be items with a list

 Destination ID (indicated by an index rather than the complete destination ID)

 Priority

When UL-SCH resource cannot accommodate SL-PRS resource request MAC CE plus its subheader, the UE should send SR to the gNB, either by SR-PUCCH or SR-PRACH.

SL-PRS resource request MAC CE is cancelled when the MAC CE is transmitted. FFS the other conditions to cancel the MAC CE.

SR triggered by the SL-PRS resource request MAC CE is cancelled when the MAC CE is transmitted. FFS the other conditions to cancel the SR.

Do not support activation/deactivation of the CG type2 by the UE sending a MAC CE.

CG confirmation MAC CE is needed when the DCI for CG type 2 activation/deactivation command is successfully received.

Decide on the issue of whether to reuse the legacy Sidelink Configured Grant Confirmation MAC CE when the CG configurations are provided by RAN1.

Confirm that dedicated/shared RP can be configured at the same time.

Leave the resource pool selection to UE implementation among resource pools allowing SL-PRS transmission when resource selection is triggered for SL-PRS transmission.

Legacy conditions for resource selection/reselection check can be reused when the shared pool is selected.

Legacy conditions for resource selection/reselection can be the baseline when the dedicated pool is selected.

The following two conditions are not applicable for the conditions for resource selection/reselection for dedicated resource pool.

 if PSCCH duration(s) and 2nd stage SCI on PSSCH for all transmissions of a MAC PDU of any selected sidelink grant(s) are not in SL DRX Active time as specified in clause 5.28.3 of the destination that has data to be sent.

 if the selected sidelink grant cannot accommodate a RLC SDU by using the maximum allowed MCS configured by RRC in sl-MaxMCS-PSSCH associated with the selected MCS table and the UE selects not to segment the RLC SDU

If the transmission with the selected grant cannot fulfill the remaining SL-PRS delay budget, resource selection/reselection is performed.

The following legacy parameters are selected/reselected when the TX resource (re-)selection is triggered in the shared resource pool.

(a) Resource reservation interval, when the transmission of periodic SL-PRS

(b) COUNTER value, when the transmission of periodic SL-PRS

(c) Number of HARQ retransmissions

(d) frequency resources within the range

The following parameters are selected/reselected when the TX resource (re-)selection is triggered in the dedicated resource pool. [15/15] FFS the number of retransmissions.

(a) resource reservation interval, when the transmission of periodic SL-PRS

(b) COUNTER value, when the transmission of periodic SL-PRS

When resource selection is triggered for the transmission of both data and SL-PRS on shared resource pool, the priority is determined by MAC as the higher priority of the two for the usage of both MAC and PHY. Send a reply LS to RAN1

The priority of the data should follow the priority of PRS when there is only SL-PRS pending for transmission on shared resource pool.

For a SL grant in dedicated resource pool, MAC layer selects the destination that has the highest priority of the SL PRS for transmission. FFS the other criteria for destination selection in shared resource pool

For a SL Grant in shared resource pool, MAC layer selects the destination with the highest priority of the SL-PRS and SL-SCH data. FFS the other criteria for destination selection in shared resource pool

When the destination of the shared resource pool is already selected when there are both SL-PRS and data pending for transmission, SL PRS is transmitted when there is remaining resources for SL-PRS after the SL-SCH with higher priority has already been allocated; if there is no higher priority data, SL-PRS can be transmitted.

If a SL PRS is transmitted in the SL grant in the shared pool, legacy LCP rules can be performed to construct MAC PDU associated with the SL grant after TBS is provided from PHY.

If the selected destination only has pending SL PRS, the MAC entity should generate MAC PDU containing only padding MAC subPDU for the transmission along with SL-PRS.

DRX and dedicated resource pool for PRS transmission should not be applied together. This does not preclude the NW configuration for dedicated RP to be configured together with DRX.

Collision handling between SL/UU for SL-PRS is based on the L1 priority.

SL-PRS is prioritized over PUSCH/PUCCH when

 The value of the priority of PUSCH/PUCCH is higher than a threshold, as in legacy

 The value of the priority of SL-PRS is lower than a threshold

Send an LS to RAN1 about the agreement on collision handling.

[For discussion:]

Proposal11: When resource selection is triggered for SL-LCH data transmission, dedicated pool should not be selected. [15/15]

Discussion:

Huawei understand there is no contradiction between P10 and P11, because one is for SL-PRS and the other for data.

ZTE wonder if it applies only for SL-LCH data transmission. Huawei think the point is that in the dedicated pool there are no resources to send the data, so it applies to all data transmission.

InterDigital are concerned on P10 if the UE implementation does not follow the LMF’s decision on the dedicated resource pool configuration provided to the gNB. Intel understand we have not agreed what the LMF will provide to the UE. Huawei think this was discussed and companies preferred to leave it to UE implementation.

Agreement:

When resource selection is triggered for SL-LCH data transmission, dedicated pool should not be selected.

[Reply LS to RAN1:]

Reply LS to R2-2309419 LS on Priority Handling for SL Positioning (R1-2308559; contact: Intel) RAN1 LS in Rel-18 NR\_pos\_enh2 To:RAN2

 Inform RAN1 of the RAN2 agreement on priority for shared resource pool

 Inform RAN1 of the other related MAC agreements, e.g., collision handling

 On what exact agreements need to be informed to RAN1, it can be part of the email discussion

* [Post123bis][401][POS] Reply LS to RAN1 on SL positioning MAC agreements (Intel)

Scope: Reply to R2-2309419:

 Inform RAN1 of the RAN2 agreement on priority for shared resource pool

 Inform RAN1 of the other related MAC agreements, e.g., collision handling

Detailed list of agreements to be concluded in LS drafting.

Intended outcome: Approved LS

Deadline: Short

Stage 3 SLPP proposals (considered in offline [401])

[R2-2309605](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2309605%20SLPP%20and%20RRC%20Signaling%20Design%20for%20SL%20positioning.docx) SLPP and RRC Signaling Design for SL positioning CATT discussion Rel-18

[R2-2310014](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2310014%20Discussion%20on%20sidelink%20positioning.docx) Discussion on sidelink positioning Spreadtrum Communications discussion Rel-18

[R2-2310194](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2310194.docx) SLPP signalling and procedures MediaTek Inc. discussion Rel-18 NR\_pos\_enh2-Core

[R2-2310347](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2310347-SL-POS-procedures-v1.docx) UE only SL positioning procedure Apple discussion Rel-18 NR\_pos\_enh2

[R2-2310691](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2310691.docx) Discussion of SLPP / LPP signalling procedures Nokia Netherlands discussion Rel-18

[R2-2310912](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2310912%20_(SLPP%20Details).docx) Further Considerations on SLPP Design Qualcomm Incorporated discussion

* [AT123bis][401][POS] Progressing TS 38.355 (Intel)

Scope: F2F offline on principles and TPs for 38.355, considering R2-2309605 / P21 of R2-2309759 / R2-2310014 / R2-2310194 / R2-2310347 / P8-P9 of R2-2310543 / R2-2310691 / R2-2310912 (not all proposals of all documents will be handled)

Intended outcome: Report to Thursday CB session in R2-2311374

Deadline: Wednesday 2023-10-11 1900 CST

Schedule: Monday 2023-10-09 1700-1800 CST, in Brk3

[R2-2311374](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2311374_%5bAT123bis%5d%5b401%5d%5bPOS%5d%20Progressing%20TS%2038.355%20(Intel)-report-v01.docx) [AT123bis][401][POS] Progressing TS 38.355 (Intel) Intel Corporation discussion Rel-18 NR\_pos\_enh2

 Recommendation 1: not support SLPP segmentation in Rel-18.

 Recommendation 2, Postpone the discussion on need code until the signalling details are clear.

 Recommendation 3: 6 octets length session ID

 Recommendation 4: not to support initiator ID unless companies identify the use case for it.

 Recommendation 5: FFS to introduce endSession Boolean value in the message header with/without the messageBody. When set to FALSE, endSession indicates an active SLPP session. When set to TRUE, endSession indicates the SLPP session has concluded. When set to TRUE, the message should always request an acknowledgement

 Recommendation 6: to introduce an additional SLPP PDU (e.g., SLPP-PDU-Common-SL-PRS-Methods-Contents), which specifies common content for SL-PRS methods only. We still keep positioning specific PDU for future proof.

 Recommendation 7:to have working assumption on option 2 “add Range and Direction as one choice in the LocationCoordinates IE ” assuming it is aligned with SA2. We may revise it if RAN1 have different view.

 Recommendation 8: to introduce the following SLPP position methods:

- SL-RTT,

- SL-AoA,

- SL-TDOA,

- SL-TOA.

 Recommendation 9: the capability exchange can be performed between two peer UEs

 Recommendation 10: Keep the EN - Editor’s note FFS if any UEs can request the capabilities from the peer UE., FFS on Endpoint A can also be the server UE

 Recommendation 11: Same as proposal in 401, the provide assistance data message contains multiple SL-PRS configurations.

 Recommendation 12: to Reuse the Request/Provide Assistance Data messages for server to get the assistance data from Anchor UEs. FFS on how to capture.

 Recommendation 13:For UE only operation, postpone the discussion on whether SLPP messages should be used instead of SL-MO-LR-Request/response.

 Recommendation 14: the agreements for SLPP can be applied for LMF involved case unless the issue is identified. FFS on session ID handling since it is also related to forwarding case.

 Recommendation 15: the server is expected to downselect based on which anchors are useful (considering anchor UE capabilities, geometry, QoS requirements, etc.), no stage 3 impact to our work. But related to SA2 work. Rely on companies’ internal coordination.

 Recommendation 16: not to discuss this in RAN2 on Server UE Selection Indication procedure, rely on internal coordination with SA2 colleagues.

 Recommendation 17: not to introduce providing discovery information procedure.

 Recommendation 18: Postpone the discussion on stage 2 procedures.

 Recommendation 19: Postpone the discussion on whether to define an equivalent of MT-LR for UE only SL positioning operation, the equivalent of MO-LR is sufficient.

Discussion:

Qualcomm think recommendations 13 and 19 involve SL-MO-LR, which should only be meaningful with an LMF. Intel recall that we postponed the discussion because it was an SA2 issue.

Lenovo have some concern about recommendation 4: They think it should refer to initiator ID “as part of the transaction ID”. Intel think this issue was discussed offline, and no clear need for the initiator ID has been shown; even if two UEs use the same transaction ID, the source UE IDs will be different, so the recipient knows who sent them.

Lenovo wonder one recommendation 8 about capturing single- vs. double-sided RTT. Intel think they both look like RTT methods from the standpoint of the measurements.

Agreements:

Not support SLPP segmentation in Rel-18.

6 octets length session ID

Not to support initiator ID unless companies identify the use case for it.

FFS to introduce endSession Boolean value in the message header with/without the messageBody. When set to FALSE, endSession indicates an active SLPP session. When set to TRUE, endSession indicates the SLPP session has concluded. When set to TRUE, the message should always request an acknowledgement

Introduce an additional SLPP PDU (e.g., SLPP-PDU-Common-SL-PRS-Methods-Contents), which specifies common content for SL-PRS methods only. We still keep positioning specific PDU for future proof.

Working assumption: Add Range and Direction as one choice in the LocationCoordinates IE. We may revise it if RAN1 have different view.

Introduce the following SLPP position methods:

- SL-RTT,

- SL-AoA,

- SL-TDOA,

- SL-TOA.

The capability exchange can be performed between two peer UEs

Keep the EN - Editor’s note FFS if any UEs can request the capabilities from the peer UE., FFS on Endpoint A can also be the server UE

Same as proposal in 401, the provide assistance data message contains multiple SL-PRS configurations.

Reuse the Request/Provide Assistance Data messages for server to get the assistance data from Anchor UEs. FFS on how to capture.

The agreements for SLPP can be applied for LMF involved case unless the issue is identified. FFS on session ID handling since it is also related to forwarding case.

The server (LMF or UE) is expected to downselect based on which anchors are useful (considering anchor UE capabilities, geometry, QoS requirements, etc.), no stage 3 impact to our work. But related to SA2 work. Rely on companies’ internal coordination.

Not to discuss in RAN2 on Server UE Selection Indication procedure, rely on internal coordination with SA2 colleagues.

Not to introduce providing discovery information procedure.

Other documents

Aspects not covered in offline [401]

[R2-2309668](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2309668%20Remaining%20issues%20on%20higher%20layer%20aspects%20for%20sidelink%20positioning.docx) Remaining issues on higher layer aspects for sidelink positioning vivo discussion Rel-18 FS\_NR\_pos\_enh2

UE-only Operation: Validity of anchor UE

Proposal 2: For UE-only Operation, RAN2 to discuss whether the selected anchor UEs must be in the coverage of both target UE and server UE, or just be in the coverage of target UE.

Proposal 3: For UE-only Operation, if selected anchor UEs are only required in the coverage of target UE, discuss whether SLPP forwarding is supported. If supported, the TP in the Annex can be considered as the baseline for further discussion.

Network-based Operation: Session ID

Proposal 6: For Network-based Operation, RAN2 to discuss the following three alternatives regarding how LMF sets the field of SLPP session ID in SLPP message between LMF and UE:

 Alt 1: LMF may assign a separate SLPP session ID and include it in SLPP message;

 Alt 2: LMF may set SLPP session ID as the routing ID/correlation ID;

 Alt 3: the SLPP session ID is set to absent.

Metafield of Discovery message

Proposal 8: Confirm that RAN2 is responsible for defining the structure of metafield in the discovery message, i.e., the structure of metafield is defined in SLPP specification.

Proposal 9: RAN2 to define the individual metafield structures separately for Announcement message, Solicitaion message and Response message.

Proposal 10: The SLPP metafield in Annoucement message may include:

 UE role

 UE ID, e.g., Application ID

 Coverage status, i.e., in coverage or not

 Supported SL positioning method/measurement

 Mobility status, stationary or movable

 SL-PRS assistant data (e.g., sequence ID)

Proposal 11: The SLPP metafield in Solicitation message may include:

 Required UE role

 Required UE ID, e.g., Application ID

 Required coverage status, i.e., in coverage or not

 Required SL positioning method/measurement

 Required mobility status, i.e., Stationary or movable

Proposal 12: The SLPP metafield in Response message may include:

 UE role

 UE ID, e.g., Application ID

P9 only, if necessary

[R2-2310217](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2310217.docx) Further considerations on sidelink positioning Intel Corporation discussion Rel-18 NR\_pos\_enh2

Proposal 9: For both LMF involved and UE only based SL positioning operation, RAN2 discuss and agree that SLPP forwarding is not needed.

[R2-2310430](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2310430%20Remaining%20issues%20on%20lower%20layer%20aspects%20for%20R18%20sidelink%20positioning%20.docx) Remaining issues on lower layer aspects for R18 sidelink positioning LG Electronics Inc. discussion Rel-18

Proposal 1. Two following options can be considered for 3-bits SL-PRS priority mapping/translation from 7/8-bits positioning QoS:

- Option 1. SL-PRS priority can be derived by following equations:

- For 7-bits accuracy, SL-PRS priority is floor(accuracy/16)

- For 8-bits accuracy, SL-PRS priority is floor(accuracy/32)

- Option 2. SL-PRS priority can be determined by configured thresholds

Proposal 2. Following fields in SL-PRS Resource Request MAC CE are used for aperiodic/one-shot SL-PRS transmission in Scheme 1:

- Destination

- SL-PRS ID (e.g. SLPP session ID and/or SL-PRS resource ID)

- SL-PRS size (Comb size and Symbol size)

Proposal 3. SL-PRSPatternInfo with SL-PRS-CombSize and SL-PRS-SymbolSize is used for periodic SL-PRS transmission in Scheme 1.

Proposal 4. RAN2 to capture the above TP for MAC PDU generation to send SCI-2D and MAC subheader in a shared resource pool.

Proposal 5. PSSCH decoding based SL-PRS retransmission is required in a shared resource pool.

Proposal 6. SL-PRS delay budget is considered as response time in positioning QoS. Resource selection/reselection due to SL-PRS delay budget should be left on UE implementation.

Proposal 7. SL-PRS is prioritized between signaling (SCCH, MAC CE) and traffic (STCH).

Proposal 8. When SL DRX is configured, the Active Time includes the time while:

- Option 1. the time during SLPP session operation (i.e. between creation and termination)

- Option 2. the time between SLPP request message and SLPP provide message

- Option 3. the time when a certain timer is running

Proposal 9. SL DRX can work in a dedicated resource pool with periodicity (i.e. on duration timer and inactivity timer) without HARQ RTT timer and retransmission timer.

Proposal 10. When SL DRX is configured, the Active Time includes the time while:

- the time between transmitting of SL-PRS and receiving of SL-PRS in SL RTT type positioning method

[R2-2309578](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2309578_Sidelink_Fraunhofer.docx) UE Positioning using Sidelink Fraunhofer IIS, Fraunhofer HHI discussion

[R2-2309630](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2309630%20Discussion%20on%20higher%20layer%20aspects%20for%20Sidelink%20Positioning_final.docx) Discussion on higher layer aspects for sidelink positioning Huawei, HiSilicon discussion Rel-18 NR\_pos\_enh2

[R2-2309631](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2309631%20Discussion%20on%20lower%20layer%20aspects%20for%20sidelink%20positoining_final.docx) Discussion on lower layer aspects for SL positioning Huawei, HiSilicon discussion Rel-18 NR\_pos\_enh2

[R2-2309669](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2309669%20Discussion%20on%20transmission%20and%20measurement%20of%20SL-PRS.docx) Discussion on transmission and measurement of SL-PRS vivo discussion Rel-18 FS\_NR\_pos\_enh2

[R2-2309741](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2309741-Further%20Discussions%20on%20Sidelink%20Positioning%20and%20Ranging.docx) Further discussion on SL positioning and ranging CEWiT discussion

[R2-2309759](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2309759%20Discussion%20on%20SL%20positioning.doc) Discussion on SL positioning Xiaomi discussion Rel-18

[R2-2310044](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2310044%20Discussion%20on%20UE%20assistance%20information%20for%20SL-PRS.doc) Discussion on UE assistance information for SL-PRS Samsung Electronics Co., Ltd discussion Rel-18 NR\_pos\_enh2

[R2-2310076](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2310076%20(7.2.2)%20open%20issue%20for%20SL%20POS%20.docx) Open issues regarding SLPP session Samsung Guangzhou Mobile R&D discussion

[R2-2310195](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2310195.docx) SLPP information forwarding MediaTek Inc. discussion Rel-18 NR\_pos\_enh2-Core

[R2-2310217](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2310217.docx) Further considerations on sidelink positioning Intel Corporation discussion Rel-18 NR\_pos\_enh2

[R2-2310275](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2310275%20Considerations%20on%20Sidelink%20positioning.doc) Considerations on Sidelink positioning CMCC discussion Rel-18 NR\_pos\_enh2

[R2-2310379](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2310379%20Further%20discussion%20on%20sidelink%20positioning.docx) Further discussion on sidelink positioning OPPO discussion Rel-18 NR\_pos\_enh2

[R2-2310429](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2310429%20Remaining%20issues%20on%20higher%20layer%20aspects%20for%20R18%20sidelink%20positioning.docx) Remaining issues on higher layer aspects for R18 sidelink positioning LG Electronics Inc. discussion Rel-18

[R2-2310436](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Docs\R2-2310436.zip) Discussion on sidelink positioning InterDigital, Inc. discussion Rel-18 NR\_pos\_enh2-Core

[R2-2310541](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2310541%20Discussion%20on%20lower-layer%20related%20sidelink%20positioning.docx) Discussion on lower-layer related sidelink positioning ZTE Corporation discussion Rel-18 NR\_pos\_enh2

[R2-2310543](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2310543%20Discussion%20on%20sidelink%20positioning.docx) Discussion on sidelink positioning ZTE Corporation discussion Rel-18 NR\_pos\_enh2

[R2-2310680](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2310680.docx) Discussion of resource allocation aspects Nokia Netherlands discussion Rel-18

[R2-2310759](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2310759_SL_Pos_Res.docx) Considerations on multiplexing, congestion control and ARP Sony discussion Rel-18 FS\_NR\_pos\_enh2

[R2-2310789](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2310789_SLPosDiscussion.docx) SL Positioning Discussion Lenovo discussion Rel-18

[R2-2310833](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2310833%20Bosch_Discussion_on_sidelink_positioning.docx) Further discussion on sidelink positioning ROBERT BOSCH GmbH discussion Rel-18 Late

[R2-2310848](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2310848.docx) Discussion of session management for SL positioning Nokia Netherlands discussion Rel-18

[R2-2310856](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2310856%20SL.docx) Remaining issue for NW involved Sidelink positioning Ericsson discussion Rel-18

[R2-2311032](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2311032_On%20sidelink%20positioning%20discovery%20and%20cap%20exchange.docx) On sidelink positioning discovery and capabilities exchange Philips International B.V. discussion NR\_pos\_enh2

[R2-2311035](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2311035_On%20the%20stability%20of%20Anchor%20UE%20Location.doc) On the stability of Anchor UE location Philips International B.V. discussion NR\_pos\_enh2

### 7.2.3 RAT-dependent integrity

Error modelling parameters, signalling, and procedures to support UE-based and LMF-based integrity of RAT-dependent positioning methods.

[R2-2309924](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2309924%20Discussion%20on%20RAT-dependent%20integrity.doc) Discussion on RAT-dependent integrity Lenovo discussion Rel-18

Proposal 1: The identified signalling used for integrity information transmission can be reused for the beam related error source for DL-AOD positioning.

Discussion:

CATT indicate that this is captured in the running CR and can be discussed there (value range of the bound is FFS).

Xiaomi understand the bounds should be provided by RAN1, and they did not provide a range for the beam-related error sources, so we could ask.

Qualcomm understand RAN1 have not defined the ranges for the other error bounds either, and the question here is whether we provide signalling for these error sources or not.

Proposal 2: In the case of UE-based integrity, LMF may indicate unavailability of Assistance Data Error sources, in case requested one or more assistance data error source information are unavailable at LMF.

Discussion:

Qualcomm think this is unnecessary and not used for other cases; if the UE does not get the information, it may mean “not available” or “not supported”, etc. They see that requiring the LMF to support the error cause would be philosophically out of line with LPP design. Ericsson agree.

Lenovo think the LMF needs to indicate to the UE that it cannot provide the information.

Intel agree with Qualcomm and wonder what the UE will do based on the error.

OPPO think a DNU flag can achieve the same effect. Intel think this is a different case, and if the LMF does not support integrity at all, it cannot provide the error cause.

vivo agree with Qualcomm.

Proposal 4: For UE-based RAT-dependent integrity, the achievable TIR reporting from UE to LMF is applied for both Mode 1 and Mode 2 reporting if supported.

Discussion:

vivo think we should discuss mode 2 first, and decide whether the achievable TIR can be reported for both modes. They understand that it will be reported when the UE cannot meet the integrity requirement, so they see P5 as unnecessary.

Lenovo want to see if there is support for reporting the achievable TIR for mode 1.

CATT indicate that the achievable TIR reporting is already there, and mode 2 is not supported. Intel agree.

Proposal 5: For UE-based integrity, RAN2 to support the error reporting with a failure cause from UE to LMF in the case that UE fails to calculate the integrity results.

Discussion:

Qualcomm think nothing new is needed in this respect. Nokia and Intel agree. OPPO think no report to the LMF is needed.

Agreement:

The identified signalling used for integrity information transmission can be reused for the beam related error source for DL-AOD positioning. Details can be discussed in CR drafting.

[R2-2310415](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2310415%20Discussion%20on%20RAT-dependent%20positioning%20integrity.doc) Discussion on RAT-dependent positioning integrity Xiaomi discussion.

Proposal 1: RAN2 don’t introduce any signalling on supporting Beam-related information (Beam Bore-Sight Direction and Beam Antenna Information) error sources in Rel-18.

Proposal 2: The UE capability on UE supporting the DNU flag (NR-Integrity-ServiceAlert) should be defined respectively for DL-TDOA and DL-AoD.

Proposal 3: The UE capability on UE supporting the inter TRP synchronization error source and TRP location error source should be defined for DL-TDOA and DL-AoD.

[R2-2310380](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2310380%20Consideration%20on%20RAT-dependent%20positioning%20integrity.docx) Consideration on RAT-dependent positioning integrity OPPO discussion Rel-18 NR\_pos\_enh2

[R2-2310823](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2310823%20R18%20NR%20POS%20A723%20RAT%20dependent%20integrity.doc) Discussion on RAT dependent integrity InterDigital Inc. discussion Rel-18

[R2-2310857](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2310857%20Integrity.docx) Support for UE-based integrity Ericsson discussion Rel-18

Discussion:

vivo think this is not specific to RAT-dependent integrity and could be considered as TEI18.

Qualcomm think it is not in the WI objectives and not necessary; it could be left to implementation whether to configure the UEs with the application requirements.

Intel agree that this is not in the WI scope, and they think we have discussed it several times without progress.

[R2-2310914](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2310914_(integrity).docx) Remaining Issues for Integrity of NR Positioning Technologies Qualcomm Incorporated discussion

[R2-2310996](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2310996%20Positioning%20Integrity.docx) Signalling about beam related information for positioning integrity Nokia, Nokia Shanghai Bell discussion Rel-18 NR\_pos\_enh2-Core

### 7.2.4 LPHAP

Enhancements for enabling LPHAP use case 6 (TS 22.104), including extending eDRX cycle (coordinated with RedCap WI); SRS configuration enhancements based on validity area for UEs in RRC\_INACTIVE; DL-PRS measurements in RRC\_IDLE and reporting in RRC\_CONNECTED; and alignment between eDRX and PRS configurations.

[R2-2309606](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2309606%20Discussion%20on%20LPHAP.docx) Discussion on LPHAP CATT discussion Rel-18

SRS configuration with validity area

#Issue 2: area-specific SRS configuration

Proposal 2: Introduce an autonomous TA adjustment enabler in the area-specific SRS configuration. If configured by the network, subject to UE capability, UE autonomously adjusts the TA, when cell-reselection happens.

Discussion:

Huawei think the proposal is OK but not RAN2 business; how to adjust the TA should be addressed in RAN1/RAN4.

Intel understand that CATT’s proposal is that if the network allows this, the UE does autonomous TA adjustment. They think we can agree to this proposal contingent on whether RAN1 agree to autonomous TA adjustment at all.

CATT think the proposal is aligned with the RAN1 LS.

Ericsson wonder if the UE will inform the network of the adjustment. They also wonder how we will guarantee accuracy, and whether we are the right group to make this decision.

Huawei understand the RAN1 agreement is that the UE autonomously adjusts the stored RSRP when there is an enabler, and they are currently discussing TA adjustment.

CATT understand that the impact is the enabler in the SRS configuration.

Qualcomm think this should come from the RAN1 parameter list.

Samsung see impact to RAN2 from whether the UE restarts the timer. Huawei think if there is a TA adjustment, the TAT should be reset, but they see this as a separate issue. ZTE think we should not introduce more work and keep the previous agreement that the TAT is restarted when the UE receives a TA command.

Xiaomi understand this parameter was provided in an LS.

Sony support the autonomous adjustment, but they think from RAN1 it was not totally clear if the adjustment should be based on RSRP or something else. Huawei think this aspect is clear from the RAN1 LS, and we only need to confirm RAN1’s agreement.

ZTE think we could agree to have the enabler based on the LS, and they assume it will be in the next version of the parameter list. Huawei think we do not need an agreement on the RRC, but we do need one for the MAC behaviour.

#Issue 3: SRS configuration request and activation indication

Proposal 3: Confirm the WA that a new resume cause is introduced for SRS configuration request from the perspective of POS WI. Inform it in the main session.

Discussion:

Ericsson think we should keep it as a WA for now but capture it in the running CR. CATT think we need to confirm it and inform the main session.

Qualcomm do not see a need to inform the main session formally; companies should be able to coordinate. They understand Ericsson’s point is that there may be multiple WIs trying to use the spares.

Intel understand the main session are looking at ways to extend Msg3, and we may not need to use the existing cause field.

OPPO think we would also need to determine that there is only one SRS configuration per validity area; otherwise the network would not know which one to activate. Intel agree with OPPO.

Huawei think there are advantages to reusing the existing field, because extended Msg3 will have coverage implications.

Proposal 4: The same indication can be used for SRS configuration request and activation indication.

#Issue 4: Validity for SRS configuration

Proposal 5: Exclude the option of using inactivePosSRS-ValidityArea-TAT to release the SRS configuration.

Proposal 6: Introduce a separate validity time to control how long the SRS resource is reserved for the UE within the validity area. When the new validity time expires, the UE releases the SRS.

Proposal 7: Send an LS to RAN3 on the introduction of validity time for SRS configuration.

Discussion:

CATT think there are issues with using inactivePosSRS-ValidityArea-TAT that can result in timer misalignment between gNBs; also, when the SRS reselects out of the validity area, it will release the configuration without the gNB knowing.

Intel think the network and UE should both be using the area TAT.

vivo think we only need the network explicit release; they do not see that the UE needs to release the configuration when the timer expires, only stop using it. Huawei agree with Intel and vivo and think the network can implicitly know when the timer is running at the UE.

Huawei understand that vivo’s suggestion is needed for the preconfiguration case.

OPPO think a new timer is not needed and adds complexity.

ZTE have the same view that a new timer is not needed and we can use the area TAT timer; all gNBs in the area can have the same understanding of when the timer starts/expires.

InterDigital have the same view as ZTE and Intel and do not see a problem with the existing mechanism.

Xiaomi think if the TAT expires, the UE could not release the SRS configuration but restart using it when it gets a new TA adjustment.

Qualcomm understand that all comments assume the gNBs know the TA timer; if the UE autonomously adjusts it, the gNB will not know. They also think the same issue is being discussed in RAN1.

Samsung also think a new timer is not needed and agree with vivo and Xiaomi.

CATT think when the UE receives a TA command from the serving gNB, the UE restarts the TAT, and the other gNBs do not know that this has happened.

Intel note that we have the network explicit release solution, and the question is whether we need an additional mechanism. With no consensus, we should not introduce a new thing.

Ericsson think the new timer would involve RAN3, and if they send us guidance to introduce such a timer we could consider it. CATT agree it can be controlled by the LMF, which is the reason for proposing an LS to RAN3.

Intel think the timer misalignment issue between gNBs does not exist if we rely on network explicit release. CATT wonder what exactly is meant by explicit release. Intel understand it means that the network sends RRCRelease without the SRS configuration, and they do not see a need to rely on RAN3 for this mechanism.

Ericsson think we could see if RAN3 request something. Intel note that RAN2 are leading the design on this aspect.

CATT wonder how the gNB would release for a UE in inactive mode. Intel think this is not a new issue and the network has to bring the UE to connected; they do not see a big power consumption problem.

vivo think the UE should send a request to update the TA when the TA is invalid, and if the network does not want to maintain the configuration, it can send a release then.

#Issue 5: Preconfigured SRS

Proposal 8: Confirm that pre-configure SRS means the network preconfigured multiple validity areas, and the SRS configuration for each validity area can reuse the structure of SRS-PosRRC-InactiveValidityAreaConfig.

Proposal 9: Postpone the discussion on the mechanisms of preconfigured SRS until the concept of the preconfigured SRS is clarified.

#Issue 6: The over listening issue of gNBs

Proposal 10: Introduce an indication for UE to indicate the network start listening to the SRS.

Proposal 11: The indication for UE to indicate the network start listening to the SRS can be a dedicate preamble for positioning feature.

Alignment between PRS and (e)DRX

Proposal 12: Introduce another expected periodicity of PRS in the On-Demand PRS request in LPP Request Assistance Data message. Each of the expected periodicities is associated with an offset.

on the LSs from RAN1/RAN4/SA2

Proposal 13: Confirm that the eRedCap agreed eDRX cycle lengths are sufficient for positioning in RRC\_INACTIVE.

Proposal 14: Extend the value of SRS/PRS periodicity and offset in RRC and LPP spec to support PRS/SRS periodicity larger than 10240ms.

Proposal 15: RAN2 confirms that reporting positioning measurements taken in RRC\_IDLE is supported with using the existing LPP reporting procedure.

Proposal 16: Send a reply LS to SA2 to indicate that RAN2 will use the existing LPP procedures to report the measurements taken in RRC\_IDLE. The draft reply LS in R2-2309597 can be taken as baseline.

Agreements:

Introduce an autonomous TA adjustment enabler in the area-specific SRS configuration. If configured by the network, subject to UE capability, UE autonomously adjusts the stored RSRP when cell-reselection happens.

Maintain the WA that a new resume cause is introduced for SRS configuration request. Implement the running CR accordingly and finalise the decision at next meeting when all WIs conclude.

There is only one SRS configuration per validity area.

Rely on network explicit release as a baseline for release of the SRS configuration in Rel-18. FFS if any other solution is needed. This agreement does not revert the existing agreement about release of the SRS configuration when the UE reselects out of the validity area.

[R2-2310381](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2310381%20Discussion%20on%20the%20leftover%20issues%20of%20LPHAP%20enhancement.docx) Discussion on the leftover issues of LPHAP enhancement OPPO discussion Rel-18 NR\_pos\_enh2

Proposal 1 Alignment of (e)DRX to fixed PRS is NOT supported.

Proposal 2 LMF-initialized on-demand PRS request procedure is NOT supported for the alignment of the PRS configuration to the fixed (e)DRX configuration, relying on UE-initiated procedures instead.

Proposal 3 Regarding enhancements on the current UE-initiated on-demand PRS request message for alignment of PRS to the fixed (e)DRX, RAN2 to discuss the following two ways forward:

- Option 1: to enhance the DL-PRS configuration itself to be included in the on-demand PRS request message

- Option 2: to include the LPHAP indication and UE-related (e)DRX information in the on-demand PRS request message

Proposal 4 RAN2 to agree to include the LPHAP indication and UE-related (e)DRX information in the on-demand PRS request message.

Proposal 5 RAN2 to agree that the PRS periodicity is extended to be larger than 10240ms to suit the eDRX cycle value for eDRX paging cycle in RRC\_INACTIVE and/or RRC\_IDLE. FFS the specific values among hf2, hf4, hf8, hf16, hf32, hf64, hf128, hf256, hf512, hf1024.

Proposal 6 RAN2 NOT to pursue the enhancement to extend SRS periodicity larger than 10240 ms.

Proposal 7 RAN2 to confirm that it is feasible for a UE that performs DL PRS measurements in RRC\_IDLE and reports the measurements in RRC\_CONNECTED via LPP message. No stage-3 spec impact in RAN2 is foreseen.

Proposal 8 UE releases the SRS (pre)configuration when the area-specific TA timer expires.

Proposal 9 UE releases the SRS (pre)configuration when UE reselects to a cell out of the SRS validity area.

Proposal 10 UE releases the SRS (pre)configuration upon the reception of RRCSetup/RRCResume/ RRCRelease without suspendConfig.

Proposal 11 RAN2 to confirm WA as “A new resume cause is introduced for both SRS configuration request and the activation indication of the pre-configured SRS”.

Proposal 12 It is up to NW implementation to distinguish between SRS configuration request and the activation indication of the pre-configured SRS.

Proposal 13 RAN2 NOT to support multiple SRS (pre)configurations for one validity area.

Proposal 14 RAN2 NOT to support multiple validity areas for the same cell.

Proposal 15 Only periodic SRS is supported for pre-configured SRS.

Proposal 16 Two separate UE capabilities are introduced for supporting SRS with validity area in RRC\_INACTIVE and supporting SRS pre-configuration in RRC\_INACTIVE respectively.

Proposal 17 RAN2 sticks to using a list of CGIs to define the validity area, and replies LS to inform RAN1.

Proposal 18 Regarding the reference RS for the current RSRP derivation, RAN2 relies on RAN1 to make decision, or leaves it to UE implementation.

[R2-2309579](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2309579_LPHAP_Fraunhofer.docx) Reliable LPHAP position with extended DRX cycle Fraunhofer IIS, Fraunhofer HHI discussion

[R2-2309629](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2309629%20Discussion%20on%20LPHAP_final.docx) Discussion on LPHAP Huawei, HiSilicon discussion Rel-18 NR\_pos\_enh2

[R2-2309670](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2309670%20Remaining%20issues%20of%20LPHAP.doc) Remaining issues of LPHAP vivo discussion Rel-18 FS\_NR\_pos\_enh2

[R2-2309922](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2309922_Discussion%20on%20alignment%20between%20(e)DRX%20and%20PRS.docx) Discussion on alignment between (e)DRX and PRS Samsung discussion Rel-18 NR\_pos\_enh2

[R2-2309923](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2309923_Discussion%20on%20SRS%20configuration%20in%20RRC_INACTIVE.docx) Discussion on SRS configuration in RRC\_INACTIVE Samsung discussion Rel-18 NR\_pos\_enh2

[R2-2309925](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2309925%20Discussion%20on%20low%20power%20high%20accuracy%20positioning.doc) Discussion on low power high accuracy positioning Lenovo discussion Rel-18

[R2-2310223](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2310223%20LPHAP.docx) Further considerations on LPHAP Intel Corporation discussion Rel-18 NR\_pos\_enh2

[R2-2310276](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2310276%20Further%20considerations on LPHAP.doc) Further considerations on LPHAP CMCC discussion Rel-18 NR\_pos\_enh2

[R2-2310416](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2310416%20Discussion%20on%20LPHA%20positioning.doc) Discussion on LPHA positioning Xiaomi discussion

[R2-2310540](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2310540%20Discussion%20on%20LPHAP.docx) Discussion on LPHAP ZTE Corporation discussion Rel-18 NR\_pos\_enh2

[R2-2310760](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2310760_LPHAP.docx) Considerations on Low Power High Accuracy Positioning Sony discussion Rel-18 FS\_NR\_pos\_enh2

[R2-2310824](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2310824%20R18%20NR%20POS%20A724%20LPHAP.doc) Discussion on LPHAP InterDigital Inc. discussion Rel-18

[R2-2310858](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2310858%20LPHAP.docx) Remaining issue on Low Power High Accuracy Positioning Ericsson discussion Rel-18

[R2-2310915](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2310915_(LPHAP).docx) Remaining issues for LPHAP Qualcomm Incorporated discussion

### 7.2.5 RedCap positioning, carrier phase positioning, and bandwidth aggregation for positioning

RAN1 led objectives that may require progress in RAN1 before RAN2 can take decisions.

Including report of [Post123][402][POS] RAN2 impact of RAN1-led positioning objectives (Nokia)

Email discussion report

[R2-2310998](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2310998%20%5bPost123%5d%5b402%5d%20RAN2%20impact%20of%20RAN1-led%20positioning%20objectives_v13_Rapp.docx) [Post123][402][POS] RAN2 impact of RAN1-led positioning objectives (Nokia) Nokia, Nokia Shanghai Bell report Rel-18 NR\_pos\_enh2-Core

Proposal 1: For Multi-RTT positioning, if requested by LMF, the UE reports the RSCP measurement along with the UE Rx-Tx time difference measurement. Extend NR-Multi-RTT-SignalMeasurementInformation IE and add DL RSCP measurement as an optional measurement quantity to be reported along with nr-UE-RxTxTimeDiff measurement.

Proposal 1a: Extend NR-Multi-RTT-SignalMeasurementInformation IE to include a timestamp associated with the reported DL RSCP measurement and a quality indication for the reported RSCP measurement.

Proposal 2: For DL-TDOA positioning, if requested by LMF, the UE reports RSCPD measurement along with the RSTD measurement. Extend NR-DL-TDOA-SignalMeasurementInformation IE and add DL RSCPD measurement as an optional measurement quantity to be reported along with nr-RSTD measurement.

Proposal 2a: Extend NR-DL-TDOA-SignalMeasurementInformation IE to include a timestamp associated with the reported DL RSCPD measurement and a quality indication for the reported RSCPD.

Proposal 3: Update the field description for nr-los-nlos-Indicator in NR-DL-TDOA-SignalMeasurementInformation IE to clarify that the indication applies also to the RSCPD measurement associated with the RSTD measurement in the reported DL-TDOA measurement.

Proposal 4: Update the field description for nr-los-nlos-Indicator in NR-Multi-RTT-SignalMeasurementInformation IE to clarify that the indication applies also to the RSCP measurement associated with the UE Rx-Tx time difference measurement in the reported Multi-RTT measurement.

Discussion:

CATT think there is a pending issue related to the PRU email discussion having to do with the associated resource set for the RSCPD measurement.

Proposal 5: For UE-assisted DL-TDOA positioning, to support Simultaneous measurement by target UE and PRU, extend the NR-DL-TDOA-RequestLocationInformation IE to be able to request RSCPD measurement.

Proposal 6: For UE-assisted Multi-RTT positioning, to support Simultaneous measurement by target UE and PRU, extend the NR-Multi-RTT-RequestLocationInformation IE to be able to request RSCP measurement.

Discussion:

vivo are fine with the proposals, but they understand that it is not just for simultaneous measurements.

Qualcomm think simultaneous measurements apply to other measurement types as well. They think all the existing measurements and the CPP measurements are applicable, but they agree that the RAN1 agreements are not completely clear. Lenovo agree with Qualcomm and think there is also some relation to SA2 discussions.

CATT indicate that the RAN1 LS on CPP measurements indicates that CPP needs the simultaneous measurements. They are not sure it applies to other measurements.

Nokia think it may be correct that the proposals should apply also to legacy measurements. They think there are other FFS points in the report that need resolving.

Ericsson think the legacy measurements should be included, because CPP is not a standalone procedure but always coupled with some timing estimation.

Proposal 7: Extend the NR-DL-TDOA-RequestLocationInformation IE and NR-Multi-RTT-RequestLocationInformation IE to include time window(s) configuration and DL PRS resource sets occurring within the indicated time window(s).

Proposal 7a: Each time window configuration in Request Location Information IE contains the following: Start of time window, Duration of time window, Periodicity of time window (Optional). The number of time windows is configurable and signalled as part of the time window configuration.

Discussion:

Nokia note that there is an FFS point on the number of instances of the time window.

CATT indicate this is already captured in the running CR based on the LS from RAN1. They understand that there is one window associated with a resource set ID, hence multiple time windows when there are multiple resource sets.

Proposal 8: For UE-based DL-TDOA positioning, extend the NR-DL-TDOA-ProvideAssistanceData IE to include the following PRU related information: reference RSCPD measurement reported by PRU, timestamp associated with the reference RSCPD measurement, and PRU location information.

Discussion:

Qualcomm think there should be an FFS point on whether the PRU measurements in assistance data also include legacy measurements.

InterDigital wonder how often the network will provide this information; is it based on UE request or something else? Qualcomm have the same question and think it should be added to the LS. CATT understand it will be sent when the PRU measurements are updated.

Proposal 9: Support RedCap UEs capable of DL PRS Rx frequency hopping, hopping within a single PRS resource of a TRP under one positioning frequency layer, to report positioning measurement in LPP Provide Location Information message with an indication whether the reported measurement is based on multiple hops or a single hop.

Discussion:

Nokia understand that the point is the hop indication.

CATT indicate that this is still FFS in RAN1 and will be further discussed. Nokia understood the indication itself was clear in RAN1 agreements and the question is what it is based on.

Proposal 10: Enhance the NR-DL-TDOA-RequestLocationInformation IE and NR-Multi-RTT-RequestLocationInformation IE as follows:

- add a field indicating the UE needs to perform joint measurement across aggregated PFLs.

- indicate the DL PRS resource sets IDs from two or three different PFLs that are linked for DL PRS BW aggregation that UE needs to use for the joint measurement.

- extend the NR-DL-TDOA-ReportConfig IE and add a new timingReportingGranularityFactor-Ext-r18 field with values {-1, -2}. Other values FFS.

- introduce a new NR-Multi-RTT-ReportConfig-Ext-r18 IE add a new timingReportingGranularityFactor-Ext-r18 field with values {-1, -2}. Other values FFS.

Proposal 11: To support PRS BW aggregation, enhance the PRS configuration assistance data provided in NR-DL-PRS-AssistanceData IE in the Provide Assistance Data message for DL-TDOA and multi-RTT positioning to provide linkage information between PRS resource sets from a TRP for two or three PFLs.

Proposal 12: Extend the NR-DL-TDOA-SignalMeasurementInformation IE and add a new field to indicate whether the reported RSTD/RSRP/RSRPP measurement is a joint measurement or not.

Proposal 13: Extend the NR-Multi-RTT-SignalMeasurementInformation IE and add a new field to indicate whether the reported UE Rx-Tx time difference/RSRP/RSRPP measurement is a joint measurement or not.

Discussion:

ZTE think there is a general issue about whether the LMF should indicate to the UE that one TRP can have multiple pairs of aggregated PFLs. They understand this is not resolved in RAN1 yet.

Qualcomm have the same understanding; they thought it was clear that the TRP can link, e.g., two PFLs in FR1 and two PFLs in FR2. They see this more as assistance data than as part of the RequestLocationInformation.

Nokia thought the multiple linkage was not clear.

ZTE think ProvideAssistanceData and RequestLocationInformation should both contain the linkage.

Qualcomm think it is assistance data and do not see why it would be in the RequestLocationInformation. CATT thought RAN1 indicated that it was part of the measurement configuration.

Proposal 14: RAN2 to note the impact analysis and the issues identified for further study i.e., FFS items in Table 1, Table 2, and Table 3 in R2-2310998.

Agreements:

For Multi-RTT positioning, if requested by LMF, the UE reports the RSCP measurement along with the UE Rx-Tx time difference measurement. Extend NR-Multi-RTT-SignalMeasurementInformation IE and add DL RSCP measurement as an optional measurement quantity to be reported along with nr-UE-RxTxTimeDiff measurement.

Extend NR-Multi-RTT-SignalMeasurementInformation IE to include a timestamp associated with the reported DL RSCP measurement and a quality indication for the reported RSCP measurement.

For DL-TDOA positioning, if requested by LMF, the UE reports RSCPD measurement along with the RSTD measurement. Extend NR-DL-TDOA-SignalMeasurementInformation IE and add DL RSCPD measurement as an optional measurement quantity to be reported along with nr-RSTD measurement.

Extend NR-DL-TDOA-SignalMeasurementInformation IE to include a timestamp associated with the reported DL RSCPD measurement and a quality indication for the reported RSCPD.

Update the field description for nr-los-nlos-Indicator in NR-DL-TDOA-SignalMeasurementInformation IE to clarify that the indication applies also to the RSCPD measurement associated with the RSTD measurement in the reported DL-TDOA measurement.

Update the field description for nr-los-nlos-Indicator in NR-Multi-RTT-SignalMeasurementInformation IE to clarify that the indication applies also to the RSCP measurement associated with the UE Rx-Tx time difference measurement in the reported Multi-RTT measurement.

For UE-assisted DL-TDOA positioning, to support Simultaneous measurement by target UE and PRU, extend the NR-DL-TDOA-RequestLocationInformation IE to be able to request RSCPD measurement.

For UE-assisted Multi-RTT positioning, to support Simultaneous measurement by target UE and PRU, extend the NR-Multi-RTT-RequestLocationInformation IE to be able to request RSCP measurement.

FFS impact of supporting simultaneous measurements for the legacy measurements that are already there in the RequestLocationInformation IEs. Capture in the reply LS on PRUs to RAN1 the question of what the impact for these measurements is.

Extend the NR-DL-TDOA-RequestLocationInformation IE and NR-Multi-RTT-RequestLocationInformation IE to include time window(s) configuration and DL PRS resource sets occurring within the indicated time window(s).

Each time window configuration in Request Location Information IE contains the following: Start of time window, Duration of time window, Periodicity of time window (Optional). The number of time windows is configurable and signalled as part of the time window configuration.

For UE-based DL-TDOA positioning, extend the NR-DL-TDOA-ProvideAssistanceData IE to include the following PRU related information: reference RSCPD measurement reported by PRU, timestamp associated with the reference RSCPD measurement, and PRU location information.

Enhance the PRS configuration assistance data provided in NR-DL-PRS-AssistanceData IE in the Provide Assistance Data message for DL-TDOA and multi-RTT positioning as follows:

- indicate the DL PRS resource sets IDs from two or three different PFLs that are linked for DL PRS BW aggregation that UE needs to use for the joint measurement (FFS if multiple combinations of linked PFLs can be indicated, e.g., 2+2 and others).

- extend the NR-DL-TDOA-ReportConfig IE and add a new timingReportingGranularityFactor-Ext-r18 field with values {-1, -2}. Other values FFS.

- introduce a new NR-Multi-RTT-ReportConfig-Ext-r18 IE add a new timingReportingGranularityFactor-Ext-r18 field with values {-1, -2}. Other values FFS.

Extend the NR-DL-TDOA-SignalMeasurementInformation IE and add a new field to indicate whether the reported RSTD/RSRP/RSRPP measurement is a joint measurement or not.

Extend the NR-Multi-RTT-SignalMeasurementInformation IE and add a new field to indicate whether the reported UE Rx-Tx time difference/RSRP/RSRPP measurement is a joint measurement or not.

LS to RAN1 to ask about the additional FFS points from tables 1/2/3 of R2-2310998. Also including FFS point on whether the PRU measurements in assistance data also include legacy measurements, and confirm whether one TRP can have multiple pairs of aggregated PFLs.

* [AT123bis][427][POS] LS to RAN1 on FFS points for Rel-18 positioning RAN1-led objectives (Nokia)

Scope: Draft an LS to RAN1 asking about the FFS points in tables 1/2/3 of R2-2310998 and the additional points identified in the related agreements.

Intended outcome: Approved LS (without CB if possible) in R2-2311391

Deadline: Thursday 2023-10-12 2000 CST

R2-2311391 (LS from [427]) Nokia LS out Rel-18 NR\_pos\_enh2-Core To:RAN1

Other documents

[R2-2309926](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2309926%20Discussion%20on%20RedCap,%20carrier%20phase%20positioning%20and%20PRS,SRS%20bandwidth%20aggregation.doc) Discussion on RedCap positioning, carrier phase positioning and PRS/SRS bandwidth aggregation Lenovo discussion Rel-18

Redcap Positioning:

Proposal 1: LMF may request gNB to provide PRS FH configuration and then indicates the determined PRS FH configuration to UE by LPP ProvideAssistanceData message.

Proposal 2: LMF may request serving gNB to provide the SRS FH configuration with SRS configuration to UE and feedback the SRS FH configuration to LMF.

Proposal 3: UE performs hop switch or BWP switch autonomously according to the configuration from network.

Carrier phase positioning:

Observation 1: RAN1 has identified the support of RSCP and RSCPD measurement, and a UE/TRP needs to report the carrier phase measurements together with the legacy positioning measurements to LMF.

Proposal 4: UE indicates the support of carrier phase positioning in LPP ProvideCapabilities message, and further includes the support of RSCP or RSCPD measurement.

Proposal 5: The legacy LPP RequestLocationInformation and ProvideLocationInformation message for time-based positioning are enhanced to carry the CPP measurement configuration and CPP measurement reporting.

Proposal 6: For double differential UL RSCP measurement, LMF indicates the time period of SRS transmission to the serving gNB of UE including target UE and PRU by enhancing current requested UL-SRS transmission characteristics information for UL positioning.

Proposal 7: For double differential DL RSCP and RSCPD measurements, LMF indicates the time period for PRS measurement to target UE and PRU by LPP provide assistance data message.

Proposal 8: Support LPP location server and target UE error cause signalling for DL Carrier phase positioning.

PRS/SRS bandwidth aggregation:

Proposal 9: An aggregation ID is used to identify the aggregated PRS resources across different carriers in pre-defined on-demand PRS configurations from LMF to UE. UE may initiate the on-demand PRS request which includes the aggregation ID for specific PRS bandwidth aggregation resource sets.

Proposal 10: RAN2 is suggested to discuss the reuse of legacy SP positioning SRS activation/deactivation MAC CE as possible to activate/deactivate the aggregated SRS resource sets simultaneously.

Proposal 11: DL positioning procedure for RRC\_INACTIVE or RRC\_IDLE state is reused to support PRS bandwidth aggregation and should be captured in stage 2 specification.

Proposal 12: RRCRelease message is enhanced to carry aggregated SRS resource set IDs across different carriers with SRS configurations to support the SRS bandwidth aggregation in RRC\_INACTIVE state.

[R2-2309607](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2309607%20Discussion%20on%20bandwidth%20aggregation%20for%20positioning.docx) Discussion on bandwidth aggregation for positioning CATT discussion Rel-18

[R2-2309608](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2309608%20LPP%20and%20RRC%20impacts%20to%20enable%20Carrier%20Phase%20Positioning.docx) LPP and RRC impacts to enable Carrier Phase Positioning CATT discussion Rel-18

[R2-2309671](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2309671%20RAN2-related%20issues%20about%20bandwidth%20aggregation.docx) RAN2-related issues about bandwidth aggregation vivo discussion Rel-18 FS\_NR\_pos\_enh2

[R2-2309893](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2309893%20Discussion%20on%20RAN1%20led%20positioning%20topics.docx) Discussion on RAN1 led positioning topics Huawei, HiSilicon discussion

[R2-2310346](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2310346-on-demand-prs-aggregation-v0.docx) On PRS bandwidth aggregation Apple discussion Rel-18 NR\_pos\_enh2

[R2-2310417](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2310417%20Discussion%20on%20carrier%20phase%20positioning%20and%20bandwidth%20aggregation%20for%20positioning.doc) Discussion on carrier phase positioning and bandwidth aggregation for positioning Xiaomi discussion

[R2-2310542](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2310542%20Discussion%20on%20BW%20aggregation%20and%20RedCap%20positioning.docx) Discussion on BW aggregation and RedCap positioning ZTE Corporation discussion Rel-18 NR\_pos\_enh2

[R2-2310761](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2310761_RedCap.docx) Discussion on Frequency hopping for Positioning for RedCap Ues Sony discussion Rel-18 FS\_NR\_pos\_enh2

[R2-2310825](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2310825%20R18%20NR%20POS%20A725%20Others.doc) Discussion on positioning for RedCap positioning, carrier phase positioning, and bandwidth aggregation for positioning InterDigital Inc. discussion Rel-18

[R2-2310859](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2310859%20RAN1LedTopic.docx) Discussion based upon RAN1 agreements on CPP, RedCap, Bandwidth aggregation Ericsson discussion Rel-18

[R2-2310916](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2310916_(PRS%20Aggregation).docx) Configuration Enhancements for DL-PRS Aggregation Qualcomm Incorporated discussion

## 7.9 Enhanced NR Sidelink Relay

(NR\_SL\_relay\_enh-Core; leading WG: RAN2; REL-18; WID: [RP-223501](http://ftp.3gpp.org/tsg_ran/TSG_RAN/TSGR_98e/Docs/RP-223501.zip))

Time budget: 1.5 TU

Tdoc Limitation: 4 tdocs

### 7.9.1 Organizational

Including incoming LSs and rapporteur inputs.

Open issues document

[R2-2309755](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2309755%20remaining%20open%20issues%20for%20SL%20relay.docx) Report of [Post123][Relay] Remaining open issues (LG) LG Electronics France report Rel-18 NR\_SL\_relay\_enh-Core

* Noted

Running CRs

[R2-2309683](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2309683%20-%20Running%20CR%20of%20TS%2038.351%20for%20SL%20Relay%20enhancement.docx) Running CR of TS 38.351 for SL Relay enhancement OPPO draftCR Rel-18 38.351 17.6.0 B NR\_SL\_relay\_enh-Core

* Revised in R2-2311556

[R2-2309911](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2309911_38.331_CR%234317_Rel-18_SL_relay_service_continuity.docx) Introduction of Rel-18 SL relay service continuity MediaTek Inc CR Rel-18 38.331 17.6.0 4317 - B NR\_SL\_relay\_enh-Core

* Revised in R2-2311557

[R2-2310166](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2310166%20Draft%2038.323%20running%20CR%20for%20enhanced%20NR%20sidelink%20relay.docx) Draft 38.323 running CR for enhanced NR sidelink relay InterDigital discussion Rel-18 NR\_SL\_relay\_enh-Core

* Revised in R2-2311558

[R2-2310359](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2310359%20Draft%20running%20CR%2038.321_new.docx) Running CR of TS 38.321 for SL Relay enhancement Apple draftCR Rel-18 38.321 17.6.0 B NR\_SL\_relay\_enh-Core Late

* Revised in R2-2311559

[R2-2310484](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2310484%20RRC%20running%20CR%20for%20Rel-18%20multi-path%20support.docx) RRC running CR for Rel-18 multi-path support Huawei, HiSilicon draftCR Rel-18 38.331 17.6.0 B NR\_SL\_relay\_enh-Core R2-2309310

* Revised in R2-2311560

[R2-2310485](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2310485%20RRC%20open%20issues%20for%20Rel-18%20Multi-path.docx) RRC open issues for Rel-18 Multi-path Huawei, HiSilicon discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2311025](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2311025%20-%2038.304_draftCR_Introduction%20of%20Rel-18%20support%20for%20SL%20Relay%20Enhancements.docx) Introduction of Rel-18 support for SL Relay Enhancements Ericsson España S.A. draftCR Rel-18 38.304 17.6.0 B NR\_SL\_relay\_enh

* Revised in R2-2311256

[R2-2311256](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2311256%20-%2038.304_draftCR_Introduction%20of%20Rel-18%20support%20for%20SL%20Relay%20Enhancements.docx) Introduction of Rel-18 support for SL Relay Enhancements Ericsson España S.A. draftCR Rel-18 38.304 17.6.0 B NR\_SL\_relay\_enh

* Revised in R2-2311561

[R2-2311264](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2311264_Introduction%20of%20NR%20sidelink%20U2U%20relay.docx) Introduction of NR sidelink U2U relay vivo draftCR Rel-18 38.331 17.6.0 B NR\_SL\_relay\_enh-Core

* Revised in R2-2311562
* [AT123bis][408][Relay] SRAP CR (OPPO)

Scope: Check and update the Rel-18 relay CR to 38.351.

Intended outcome: Endorsable CR in R2-2311556

Deadline: Thursday 2023-10-12 2000 CST

R2-2311556 Running CR of TS 38.351 for SL Relay enhancement OPPO draftCR Rel-18 38.351 17.6.0 B NR\_SL\_relay\_enh-Core

* [AT123bis][409][Relay] Relay RRC CR on service continuity (MediaTek)

Scope: Check and update the Rel-18 relay CR to 38.331 on service continuity.

Intended outcome: Endorsable CR in R2-2311557

Deadline: Thursday 2023-10-12 2000 CST

R2-2311557 Introduction of Rel-18 SL relay service continuity MediaTek Inc CR Rel-18 38.331 17.6.0 4317 1 B NR\_SL\_relay\_enh-Core

* [AT123bis][410][Relay] Relay PDCP CR (InterDigital)

Scope: Check and update the Rel-18 relay CR to 38.323.

Intended outcome: Endorsable CR in R2-2311558

Deadline: Thursday 2023-10-12 2000 CST

R2-2311558 Draft 38.323 running CR for enhanced NR sidelink relay InterDigital discussion Rel-18 NR\_SL\_relay\_enh-Core

* [AT123bis][411][Relay] Relay MAC CR (Apple)

Scope: Check and update the Rel-18 relay CR to 38.321.

Intended outcome: Endorsable CR in R2-2311559

Deadline: Thursday 2023-10-12 2000 CST

R2-2311559 Running CR of TS 38.321 for SL Relay enhancement Apple draftCR Rel-18 38.321 17.6.0 B NR\_SL\_relay\_enh-Core

* [AT123bis][412][Relay] Relay RRC CR on multi-path (Huawei)

Scope: Check and update the Rel-18 relay CR to 38.331 on multi-path relay.

Intended outcome: Endorsable CR in R2-2311560

Deadline: Thursday 2023-10-12 2000 CST

R2-2311560 RRC running CR for Rel-18 multi-path support Huawei, HiSilicon draftCR Rel-18 38.331 17.6.0 B NR\_SL\_relay\_enh-Core R2-2309310

* [AT123bis][413][Relay] Relay idle mode CR (Ericsson)

Scope: Check and update the Rel-18 relay CR to 38.304.

Intended outcome: Endorsable CR in R2-2311561

Deadline: Thursday 2023-10-12 2000 CST

R2-2311561 Introduction of Rel-18 support for SL Relay Enhancements Ericsson España S.A. draftCR Rel-18 38.304 17.6.0 B NR\_SL\_relay\_enh

* [AT123bis][414][Relay] Relay RRC CR on UE-to-UE (vivo)

Scope: Check and update the Rel-18 relay CR to 38.331 on UE-to-UE relay.

Intended outcome: Endorsable CR in R2-2311562

Deadline: Thursday 2023-10-12 2000 CST

R2-2311562 Introduction of NR sidelink U2U relay vivo draftCR Rel-18 38.331 17.6.0 B NR\_SL\_relay\_enh-Core

### 7.9.2 UE-to-UE relay

Single-hop Layer-2 and Layer-3 UE-to-UE relay for unicast. Including common L2/L3 functionality comprising relay discovery and (re)selection and L2-specific functionality including adaptation layer design, control plane procedures, and QoS handling if needed.

Including report of [Post123][406][Relay] Local ID in SRAP (OPPO)

Email discussion report

[R2-2309905](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2309905%20-%20Summary%20of%20%5bPost123%5d%5b406%5d%5bRelay%5d%20Local%20ID%20in%20SRAP%20(OPPO).docx) Summary of [Post123][406][Relay] Local ID in SRAP (OPPO) OPPO discussion Rel-18 NR\_SL\_relay\_enh-Core

Proposal 1 [15/19] For SRAP header in U2U Relay, the UE ID size is 8bits for each UE (i.e., 16 bits for the E2E UE pair).

Discussion:

Apple would like to keep the SRAP header size the same, but they can accept the majority view.

Proposal 2 [19/20] For SRAP header in U2U Relay, the Bearer ID size is 5bits. FFS how to derive 5-bit value BEARER ID from SLRB configuration index

Proposal 3 [20/20] The Local UE ID of the U2U Remote UE is assigned before E2E SL-SRBs transmission.

Proposal 4 [21/24] RAN2 to discuss using PC5-RRC message to indicate the Local ID from relay UE to Remote UEs, FFS on how the Local ID is link to User Info at the remote UE. FFS on reuse old PC5-RRC signaling or new PC5-RRC signalling

Discussion:

Apple think on the FFS in P2, we might be able to use the LCID rather than deriving from the configuration index; the Tx UE will determine the LCID based on implementation.

NEC think on P4, the RRCReconfigurationSidelink message could be reused.

vivo agree with Apple that the LCID can work, but we already agreed to use the configuration index to derive the bearer ID as the security input; they also agree with NEC on P4.

OPPO are not sure the LCID can work in P2, because we indicated to SA3 that the configuration index will be used. Huawei agree with OPPO. ZTE have the same view and think the LCID does not work to configure the E2E configurations. Lenovo also agree.

OPPO can accept if there is a majority view for using the RRCReconfigurationSidelink in P4, but they think the signalling model here is different, with the message coming from the Rx UE to the Tx UE.

Proposal 5 [ToDis] If PC5-RRC message is to be used to indicate the Local ID to remote UE, RAN2 to discuss how to link the User Info with Local ID:

Option-1: Carry User Info and Local ID in PC5-RRC message with the assumption that User Info is provided from Prose layer to AS layer;

Option-2: Carry L2 ID and Local ID in PC5-RRC message with the assumption that the association between User Info and L2 ID is done at Prose layer.

Discussion:

NEC prefer option 2 because the AS layer has historically not known about the user info.

Apple think option 2 does not work: The remote UE will not understand what is intended, and they think option 1 can be done without any new signalling.

ZTE prefer option 2 for the same reason as NEC. They agree that there will be spec impact: The relay UE needs to tell the L2ID of the target UE to the source UE, but they understand that SA2 should be able to accommodate this.

CATT agree with ZTE, and they think Apple are assuming too restricted a scenario.

Qualcomm agree with Apple that the L2IDs are not known between the remote UEs. They are not sure that the impact of option 2 would be acceptable to SA2 considering that they closed the WI.

Lenovo note that the L2ID is optional, and if we have option 2 it would need to change to mandatory.

OPPO understand that the L2ID currently in PC5-S is the ID of the target UE, and here we are discussing the ID of the source UE itself.

Apple have the same understanding as OPPO; they think SA2 discussed a CR related to this and did not want to adopt it, and we should not impose a design requirement on them.

Samsung think SA2 can do it as maintenance.

Qualcomm think this is a substantive technical issue and option 1 can work without impacting SA2. NEC think there will need to be inter-layer information exchanges anyway.

vivo think we should look at the RAN2 spec impact as well; they think it is reasonable to ask SA2 if option 2 is acceptable. Chair thinks there may not be time to turn around an LS exchange. Samsung think we should decide here.

Apple think option 1 is easy and has minimal spec impact, and would allow us to proceed without depending on SA2.

Ericsson have a slight preference to option 1, but they wonder if we could check internally for one more meeting cycle.

Show of hands:

Option 1 (user info from ProSe layer to AS layer): 6

Option 2 (association at ProSe layer): 13

Qualcomm are not sure option 2 is feasible in SA2; they would like to ask SA2 about the impact of the two options and if they have a preference. OPPO think we could take a WA and notify SA2 of RAN2 preference; otherwise we will be missing functionality next meeting. vivo agree with OPPO. LG think we should indicate that we need to close the WI and an early reply is appreciated, and we can mention option 1 as an alternative in case SA2 have a problem with option 2. Samsung think we should be clear about RAN2 preference and allow SA2 to comment on feasibility.

CATT think we do not need to send an urgent LS, because SA2 will not have time to process it in this meeting cycle anyway. They would prefer not to include option 1 as it has minority support in RAN2; anyway they think SA2 will check our minutes. OPPO agree that we should not include option 1, or at least not invite SA2 to express a preference; we could mention it as a backup only, if at all. Qualcomm think option 1 has no technical problem from RAN2 perspective.

LG think we could not indicate option 1 to SA2, but assume from RAN2 side that we will use it if SA2 object to option 2.

NEC think SA2 are trying to prevent the AS from knowing the user info.

Proposal 6 Send LS to SA2 on the RAN2 conclusion on Proposal 4 and Proposal 5.

Proposal 7 [20/20] The UE ID assignment for U2U remote UEs is up to U2U relay UE implementation, i.e., no specification impact on how to assign the local ID is needed.

Agreements:

For SRAP header in U2U Relay, the UE ID size is 8bits for each UE (i.e., 16 bits for the E2E UE pair).

For SRAP header in U2U Relay, the Bearer ID size is 5bits. FFS how to derive 5-bit value BEARER ID from SLRB configuration index.

The Local UE ID of the U2U Remote UE is assigned before E2E SL-SRBs transmission.

Reuse RRC ReconfigurationSidelink to indicate the Local ID pair from relay UE to Remote UEs.

WA: Carry L2 ID and Local ID in RRCReconfigurationSidelink message with the assumption that the association between User Info and L2 ID is done at ProSe layer.

LS to SA2 to indicate the above WA and ask SA2 to implement it if feasible. If not, RAN2 intend to adopt option 1, but the details do not need to be included in the LS. RAN2 intend to implement according to the WA in RAN2#124, and if SA2 indicate it is not feasible, it can be handled in maintenance.

The UE ID assignment for U2U remote UEs is up to U2U relay UE implementation, i.e., no specification impact on how to assign the local ID is needed.

* [AT123bis][420][Relay] LS to SA2 on L2ID and user info (LG)

Scope: Draft an LS to SA2 (Cc: CT1) indicating the RAN2 WA on association between user info and L2ID and inquiring as to its feasibility.

Intended outcome: Approvable LS in R2-2311384

Deadline: Wednesday 2023-10-11 2000 CST

[R2-2311384](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2311384%20Draft%20LS%20on%20L2ID%20and%20user%20info.doc) [Draft] LS on L2ID and User Info for L2 based U2U LG LS out Rel-18 NR\_SL\_relay\_enh To:SA2 Cc:CT1

* Remove comma in third paragraph
* Remove second part of action
* Add in body of LS: “RAN2 intend to implement this working assumption if SA2 indicate it is feasible.”
* Add in third paragraph: “based on two options that are both feasible from RAN2 perspective”
* Remove last sentence of description
* Revised in R2-2311566

Discussion:

LG note that the comma in paragraph 3 can be deleted.

Apple wonder what “implement the association” means in practical spec terms.

Qualcomm think the last part of the action is not needed and we should not mandate SA2 to do something specific. They would prefer to leave the decision to SA2 on whether to change their spec. OPPO think if we just ask about feasibility, SA2 may answer “yes” and not know whether we act on it until they get another LS. Qualcomm think that if SA2 consider it feasible, they will implement.

OPPO suggest we clarify that RAN2 plan to act on the answer, i.e., we will implement if SA2 say it is feasible.

vivo think we could ask them to do the necessary implementation if feasible.

ZTE think we do not need the indication about pursuing another option if not feasible. Qualcomm understood that we should make it clear to SA2 that we do have an alternative.

CATT have the same concern as ZTE and think the last sentence will cause confusion. Xiaomi think the last sentence invites SA2 to do nothing and leave it to RAN2.

Qualcomm think the WA is a RAN2 preference.

Samsung agree that the last sentence is a bit problematic.

Qualcomm think the WA was already a compromise, and there was no agreement on option 1.

Xiaomi think having a WA implies that there was more than one solution, and they think it is clear to SA2 without the sentence.

OPPO suggest in the third paragraph: “RAN2 discussed this issue based on two options and then RAN2 made a WA…”, without the last sentence of the description. Huawei support this approach. Qualcomm think we should list the two options, and we do not want to mandate SA2 to do something based on the assumption that option 2 is the only solution.

LG and Kyocera think the original LS is better.

Xiaomi think we should be mindful that SA2 closed their WI while expecting some maintenance activity; they think we are not asking for an unreasonable amount of work from them.

P3/P4/P5/P6/P7/P8

[R2-2310405](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2310405-Remaining%20issues%20for%20U2U%20relay.docx) Remaining issues for U2U relay operation LG Electronics Inc. discussion Rel-18

Proposal 3: We prefer to use AS signalling for QoS splitting.

Discussion:

CMCC wonder if this means RRCReconfigurationSidelink.

Qualcomm understand that the proposal is to put the QoS profile in AS signalling; they have a concern about putting upper-layer information in AS. They think we do not need new parameters and PC5-S already carries the QoS split information.

OPPO understand PC5-S can be reused directly in L3, but for L2 the QoS split needs to be done after link establishment. Qualcomm think the same PC5-S message can still be reused.

ASUSTeK agree with Qualcomm.

InterDigital wonder if the network would be involved in the split; if so, AS signalling would seem to make sense.

Apple support the proposal; regarding Qualcomm’s comment, they do not see a big problem with including this configuration in AS signalling.

Ericsson slightly prefer using PC5-S signalling.

Huawei prefer AS signalling to avoid making SA2 define related procedures; SA2 already left this up to RAN2. Samsung also support the proposal and agree with Huawei that we do not know if we can reuse the PC5-S procedure.

CATT think QoS profile in AS signalling is not new; there is already a PC5 QoS profile in the RRCReconfigurationSidelink.

ZTE prefer to use PC5-S because it already works for L3. CATT understand that SA2 clearly left this to us.

Qualcomm understand that SA2 left it to us because of limited time. They would like to send an LS to SA2 to ask if PC5-S works. Nokia think there is not enough time, and it was left to us.

Ericsson think the LS from SA2 did not explicitly leave us all the work, but SA2 considered that the L3/L2 specific aspects were under RAN2 purview. They think implementing this in AS would duplicate functionality between layers.

InterDigital understood that SA2 left us the full mandate to do the design.

LG agree with InterDigital that SA2 left it to be specified by RAN2.

Qualcomm think the LS left it open that we can indicate if anything needs to be done by SA2.

Ericsson think new signalling in AS would require nontrivial work, and using PC5-S means RAN2 do not have to do anything, but if SA2 reject it we will have to do something.

Xiaomi agree with Ericsson and think we could include this topic in the previously allocated LS.

Samsung are not sure how we can check the WA. OPPO understand from SA2 colleagues that the PC5-S message from remote UE to relay UE for L2 cannot include the QoS split information; they think we could give time to check internally and come back. Ericsson wonder if there is a technical reason why it would not be possible; it looks like just signalling.

Qualcomm would prefer to send an LS to SA2. Apple think this would risk ping-pong considering that they already left it to us.

OPPO think we need to decide this meeting.

Qualcomm cannot accept a WA that results in duplicated functionality.

Lenovo note we already agreed that the AS layer is responsible for the QoS split, and it may be unnatural to then use upper layer signalling for it.

OPPO think the possible duplicated functionality is not a problem.

vivo have some concern about spec impact, since we would need differentiation between L2 and L3 relay.

Ericsson think it is about end-to-end QoS indication rather than QoS split.

Lenovo checked the SA2 LS and found that it explicitly asks for AS signalling, and that we would notify SA2 if we identify impact to them.

WA: AS signalling is used to indicate the end-to-end QoS and QoS split for L2 U2U relay.

Proposal 4: If the gNB of the relay UE performs local ID assignment for the source and target remote UE, the relay UE should report the source remote UE L2 ID and target remote UE L2 ID.

Proposal 5: If the gNB of the relay UE performs a QoS split, the relay UE delivers the QoS profile received from the source remote UE to the gNB.

Proposal 6: If the source remote UE is in RRC\_CONNECTED, the source remote UE reports the received split QoS value from the relay UE to its serving gNB.

- If the source remote UE operates in mode-1 resource allocation, the gNB can give a proper grant for sidelink resources.

- If the source remote UE operates in mode-2 resource allocation, the gNB can give a proper resource pool allocation.

Proposal 7: If the source remote UE is in RRC\_CONNECTED, the source remote UE reports the L2 ID of the relay UE as a destination ID.

Proposal 8: If the gNB of the source remote UE performs the end-to-end bearer configuration, the source remote UE should report the L2 ID of the target remote.

Discussion:

Ericsson understand we already agreed not to involve the gNB. Nokia, InterDigital, and Qualcomm agree, but InterDigital think there may be a need to involve the gNB in certain cases.

LG think we need to understand the level of gNB involvement.

OPPO think we already agreed that mode 1 is supported, so P7 should be agreeable. Ericsson think this is legacy operation and we do not need to agree to anything new.

Apple think we have not decided if we have a new list in the SUI message for U2U relay.

Qualcomm agree that P7 is legacy operation.

Ericsson think we could agree that there is no gNB involvement (beyond legacy) in the ID reporting/resource allocation procedures for an RRC\_CONNECTED UE. Huawei think we could discuss bearer configuration first. ZTE think we have not decided if the e2e bearer configuration should be performed by the gNB.

LG think we should avoid complex discussions about the bearer configuration. They understand we have mode 1 operation according to legacy procedures and no other gNB involvement.

OPPO think we would have impact to the SUI to indicate when the traffic is for U2U relay.

NEC think the gNB needs the SLRB configuration for a mode 1 UE to determine the LCIDs.

Agreements:

There are no additional procedures at the gNB beyond Rel-16 operation in the ID reporting/resource allocation procedures for an RRC\_CONNECTED U2U relay/remote UE. Some Rel-16 functionality may not be applicable to U2U (to be determined on a case by case basis). FFS stage 3 impact to message formats (e.g., additional fields).

Mode 1 resource allocation is supported for U2U relay according to Rel-16 procedures.

P1/P2/P3/P4/P5/P6/P7/P8a/P8b/P9/P10/P11 (some topics may go to offline)

[R2-2309975](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2309975_Discussion%20on%20U2U%20Relay%20discovery%20and%20(re)selection.doc) Discussion on U2U Relay discovery and (re)selection ZTE, Sanechips discussion Rel-18 NR\_SL\_relay\_enh-Core

Relay discovery:

Proposal 1: [Issue 5.1] Separate thresholds are configured for U2U relay UE for Model A, Model B and integrated discovery respectively.

Proposal 2: [Issue 5.2] The same threshold(s) is configured for U2U remote UE for relay selection and re-selection trigger evaluation.

Proposal 3: When relay (re)selection is triggered, integrated-discovery can be also triggered to discover and select a relay UE.

Proposal 4: [Issue 5.9] Relay communication resource pool is used for DCR message with integrated-discovery.

Proposal 5: [Issue 5.13] Only SL-RSRP is applied to PC5 link quality evaluation for forwarding DCR message with integrated discovery.

Proposal 6: [Issue 5.16] For U2U relay UE and target remote UE, AS layer check discovery transmission condition before delivering received discovery message to upper layer. If not satisfied, AS layer does not deliver the received discovery message to upper layer so that the upper layer does not need to generate the discovery message for the next step.

Relay (re)selection:

Proposal 7: When PC5 RLF of the direct link is detected, remote UE can trigger relay selection.

Proposal 8a: [Issue 5.14] When there is no direct link, if remote UE detects SL-RSRP or SD-RSRP of the peer remote UE is below a threshold or there is no signal received from the peer remote UE, the remote UE can be triggered to perform relay selection.

Proposal 8b: [Issue 5.14] There is no need to differentiate whether there is a established PC5 link between the two remote UEs when evaluating SL-RSRP/SD-RSRP of peer remote UE for relay selection trigger.

Proposal 9: Relay UE sends indication to the remote UE upon detecting the PC5 link quality of the second hop is below a configured threshold. When receiving the indication, the remote UE may trigger relay re-selection even if the PC5 link quality of the first hop is good.

Proposal 10: [Issue 5.11] RAN2 confirm the following agreement applies to both source remote UE and target remote UE, and applies to both L2 and L3 U2U relay.

− When the remote UE receives PC5-RLF indication from the U2U relay UE, it would inform upper layers and rely on upper layers to trigger relay reselection (or not).

Proposal 11: [Issue 5.12] When receiving PC5 RLF notification from the relay UE, the remote UE can release the PC5 link with the relay UE only if the upper layer indicates to trigger relay re-selection and there are no multiplexed traffic of different peer remote UEs in the PC5 link. Otherwise, the remote UE should keep the PC5 link with the relay UE.

* [AT123bis][421][Relay] U2U discovery and (re)selection (ZTE)

Scope: F2F offline to discuss P1/P2/P3/P4/P5/P6/P7/P8a/P8b/P9/P10/P11 of R2-2309975 and find agreeable ways forward.

Intended outcome: Report to CB session in R2-2311385

Deadline: Wednesday 2023-10-11 2000 CST

Schedule: Wednesday 2023-10-11 1100-1200 CST, in Brk3

R2-2311385 (Report of [421]) ZTE discussion Rel-18 NR\_SL\_relay\_enh-Core

* Not provided (two numbers were allocated)

[R2-2311531](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2311531%20Summary%20of%20%5bAT123bis%5d%5b421%5d%5bRelay%5d%20U2U%20discovery%20and%20(re)selection%20(ZTE).docx) Summary of [AT123bis][421][Relay] U2U discovery and (re)selection (ZTE) ZTE discussion Rel-18 NR\_SL\_relay\_enh-Core

Proposal 1: [Issue 5.1] The same threshold(s) is configured for U2U relay UE for Model A, Model B and integrated discovery respectively.

Proposal 2: [Issue 5.2] The same threshold(s) is configured for U2U remote UE for relay selection and re-selection trigger evaluation.

Proposal 3: When relay (re)selection is triggered, integrated discovery can be triggered to discover and select a relay UE. No impact on running CR is foreseen.

Proposal 4: [Issue 5.9] Communication resource pool is used for the DCR/DCA message with integrated-discovery.

Proposal 5: Whether the threshold of SL-RSRP or SD-RSRP is used for PC5 link quality evaluation for forwarding DCR message with integrated discovery is FFS.

Proposal 6: [Issue 5.16] For U2U relay UE and target remote UE, it can be up to UE implementation on cross-layer interaction for the AS layer condition check for discovery message forwarding. Check whether and how to capture it in the CR drafting.

Proposal 7: [Issue 5.11] RAN2 confirm the following agreement applies to both source remote UE and target remote UE. FFS for L3 U2U relay.

- When the remote UE receives PC5-RLF indication from the U2U relay UE, it would inform upper layers and rely on upper layers to trigger relay (re)selection (or not).

Discussion:

Ericsson understand on P5 that only SD-RSRP can be used for the initial message.

Huawei think P1 has some relation to P5. ZTE indicate this was discussed, and we agreed that for model A both thresholds can be used, so the relay UE should be configured with both thresholds. Huawei thought only SD-RSRP should be configured for discovery.

ZTE indicate that for model A, the relay UE may already have established a PC5 link with neighbouring UEs, so either RSRP can be used, meaning that both thresholds need to be configured for model A. Huawei think the discovery message will still be used.

Ericsson think you cannot use existing PC5 links because the L2ID will be different.

LG think in the model A case, the relay UE can use the SD-RSRP between the relay UE and the candidate target remote UE.

vivo have the same understanding as Ericsson.

Huawei understand the SL-RSRP is only used when the relay UE decides which candidate target remote UEs are visible; in this light they are OK with P1 as long as the procedural text is clear. For model B and integrated discovery they think SD-RSRP is sufficient.

Xiaomi think we could reframe P1 to say that both types of thresholds need to be configured. ZTE think the point is that if SD-RSRP is configured it can be used for all cases.

vivo understand the meaning is that the UE has two thresholds, for SL-RSRP and SD-RSRP, and it uses the threshold appropriate to what it is measuring. In each model, the question is which one the UE will use.

ZTE indicate on P5, we agreed that SL-RSRP is used at the remote UE for the DCR message received from relay UE. They think we could use a similar criterion at the relay UE. Huawei understand this was decided because the DCR is communication, but because discovery uses broadcast without power control, they think in integrated discovery, SD-RSRP might make more sense.

Apple agree that SD-RSRP might make more sense. vivo agree that the earlier agreement was taken without much discussion and might be good to revert.

Xiaomi understand that SL-RSRP is limited to the single PC5 connection to the target, and here they understand that it has to use SD-RSRP in general.

InterDigital think we have to be clear about threshold vs. measurement; if we talk about SD-RSRP measurements on a message that is not discovery, it is not actually SD-RSRP.

Ericsson wonder about the case that a relay UE already has a relay connection with the candidate target remote UE (for a different source remote UE), so it can measure SL-RSRP. ZTE understand that in this case the target UE still needs to detect the DCR message with no power control, so the SD-RSRP threshold seems appropriate.

Apple understand that in Ericsson’s scenario the message may not be DCR, but it is still a non-discovery signalling message and may be power controlled on the existing relay link.

Kyocera think for the regular DCR case (not integrated discovery), the target remote UE applies a different threshold to determine whether to accept it.

Ericsson understand that if the source does not have a pre-existing link to the destination, it will send the DCR in a discovery message; if it does have one, and a new source is trying to find the same destination, the relay should apply the SL-RSRP threshold to communication with the destination to determine whether to forward, because the messages on the relay/destination link are power controlled.

OPPO checked the SA2 specification and found that the DCR in integrated discovery is broadcasted on both hops, so they understand that Ericsson’s scenario does not apply to integrated discovery. ZTE have the same understanding; they agree that when power controlled unicast signalling is used, SL-RSRP thresholds can be applicable.

Ericsson understand that the DCR is inside a discovery message, and this is the meaning of “integrated” discovery. vivo understand otherwise: It is a DCR message with a relay indication. ZTE agree with vivo.

Xiaomi think there was a proposal related to P7 about RLF on the direct link. The intention is that directly connected UEs that experience RLF could notify upper layers to trigger relay selection. ZTE indicate that this was discussed but did not reach consensus, but they think P7 itself should be agreeable. Xiaomi thought there was no technical issue, just questions of wording.

Xiaomi wonder if we should inform SA2 about the notification to upper layers. ZTE think no LS is required, because we are just confirming the applicability of an agreement of which they have already been notified.

Qualcomm understand that P7 could not apply as written to L3 remote UE, because there is no agreement to have the PC5-RLF indication from the L3 relay UE.

Agreements:

The U2U relay UE is configured with SL-RSRP and SD-RSRP thresholds for discovery, and it applies the threshold appropriate to the quantity it measures. This applies to all discovery models (A/B/integrated) from signalling point of view, with the single exception as below.

The relay UE determines whether to forward the DCR in integrated discovery based on SL-RSRP measurements, but it applies the SD-RSRP threshold.

RAN2 confirm the following agreement applies to both source L2 remote UE and L2 target remote UE. FFS for L3 U2U relay, including whether there is a need for the PC5-RLF indication in this case.

- When the remote UE receives PC5-RLF indication from the U2U relay UE, it would inform upper layers and rely on upper layers to trigger relay (re)selection (or not).

The same threshold(s) is configured for U2U remote UE for relay selection and re-selection trigger evaluation.

When relay (re)selection is triggered, integrated discovery can be triggered to discover and select a relay UE. No impact on running CR is foreseen.

Communication resource pool is used for the DCR/DCA message with integrated-discovery.

For U2U relay UE and target remote UE, it can be up to UE implementation on cross-layer interaction for the AS layer condition check for discovery message forwarding. Check whether and how to capture it in the CR drafting.

Potential SA2 issue on local ID management

[R2-2309613](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2309613%20Cross%20Group%20Issue%20for%20U2U%20Relay.docx) Cross Group Issue for U2U Relay CATT discussion Rel-18 NR\_SL\_relay\_enh-Core

Proposal 1: RAN2 confirms that through U2U relay discovery and per hop PC5-S connection establishment procedures, the source 5G ProSe End UE cannot acquire the target 5G ProSe End UE’s L2 ID.

Proposal 2: Relay UE should notify the target 5G ProSe End UE’s L2 ID to the source 5G ProSe End UE before the local ID allocation procedure.

Proposal 3: RAN2 sends one LS to SA2 to inform that Relay UE should notify the target 5G ProSe End UE’s L2 ID to the source 5G ProSe End UE before local ID allocation procedure, e.g., during the discovery procedure or the per hop PC5-S connection establishment.

Other documents

[R2-2309612](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2309612%20Disussion%20on%20U2U%20Relay.docx) Discussion on U2U Relay CATT discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2309679](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2309679%20-%20Discussion%20on%20control%20plane%20procedure%20of%20U2U%20Relay.docx) Discussion on control plane procedure of U2U relay OPPO discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2309680](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2309680%20-%20Discussion%20on%20user%20plane%20procedure%20of%20U2U%20Relay.docx) Discussion on user plane procedure of U2U relay OPPO discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2309817](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2309817%20Discussion%20on%20CP%20aspects%20for%20U2U%20relay.docx) Discussion on CP aspects for U2U relay Xiaomi discussion

[R2-2309822](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2309822_Remaining%20issues%20on%20U2U%20relay.docx) Remaining issues on U2U relay vivo discussion

[R2-2309885](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2309885%20Remaining%20issues%20on%20AS%20layer%20configuration%20for%20L2%20U2U%20Relay.docx) Remaining issues on AS layer configuration for L2 U2U Relay ASUSTeK discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2309886](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2309886%20Remaining%20issues%20on%20PC5%20radio%20link%20failure%20and%20PC5%20link%20release.docx) Remaining issues on PC5 radio link failure and PC5 link release ASUSTeK discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2309887](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2309887%20Remaining%20issue%20on%20E2E%20PC5-RRC%20procedures.docx) Remaining issue on E2E PC5-RRC procedures ASUSTeK discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2309901](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2309901%20Discussion%20on%20U2U%20relay_2.doc) Discussion on U2U relay Fujitsu discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2309927](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2309927%20Discussion%20on%20L2%20U2U%20relay%20v1.0.docx) Discussion on L2 U2U relay Lenovo discussion Rel-18

[R2-2309970](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2309970%20Control%20plane%20issues%20for%20L2%20U2U%20relay.doc) Control plane issues for L2 U2U relay Samsung discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2309976](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2309976_Discussion%20on%20U2U%20relay%20L2%20specific%20functionality.doc) Discussion on U2U relay L2-specific functionality ZTE, Sanechips discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2310012](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2310012%20Discussion%20on%20UE-to-UE%20relay.doc) Discussion on UE-to-UE Relay Spreadtrum Communications discussion Rel-18

[R2-2310093](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2310093%20Discussion%20on%20remaining%20issue%20of%20U2U%20relay.docx) Discussion on remaining issue of U2U relay NEC discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2310139](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2310139%20Open%20issues%20on%20QoS.docx) Open issues on QoS for U2U Nokia, Nokia Shanghai Bell discussion NR\_SL\_relay\_enh-Core

[R2-2310167](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2310167%20(R18%20SL%20Relay%20WI_AI792%20U2U%20Relays_Open).doc) Open Issues on Discovery, Relay Selection, and SRAP for UE to UE Relays InterDigital discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2310168](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2310168%20(R18%20SL%20Relay%20WI_AI792%20U2U%20Relay_QoS).doc) QoS and Configuration for L2 UE-to-UE Relays InterDigital discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2310226](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2310226+Discussion%20on%20the%20remaining%20issues%20on%20L2%20U2U%20relay.doc) Discussion on the remaining issues on L2 U2U relay China Telecom discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2310256](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2310256%20Discussion%20on%20U2U%20SL%20relay.docx) Discussion on U2U SL relay CMCC discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2310348](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2310348%20Discussion%20on%20U2U%20relay%20issues.doc) Discussion on remaining issues on UE-to-UE Relay Apple discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2310406](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2310406-Control%20plane%20procedure%20for%20U2U%20relay.docx) Control plane procedure for U2U relay operation LG Electronics Inc. discussion Rel-18

[R2-2310486](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2310486%20Discussion%20on%20UE-to-UE%20relay.doc) Discussion on UE-to-UE relay Huawei, HiSilicon discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2310597](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2310597.docx) Discussion on Open Issues for U2U relay RRC Beijing Xiaomi Mobile Software discussion Rel-18 38.331 NR\_SL\_relay\_enh-Core

[R2-2310613](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2310613%20Open%20issues%20on%20U2U.docx) Open issues on U2U Nokia, Nokia Shanghai Bell discussion NR\_SL\_relay\_enh-Core

[R2-2310770](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2310770.doc) UE-to-UE relay (re)selection Sony discussion Rel-18 NR\_SL\_relay\_enh

[R2-2310779](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2310779-Open%20issues%20for%20Discovery%20and%20Relay%20(re)selection.docx) Open issues for Discovery and Relay (re)selection Qualcomm Incorporated discussion NR\_SL\_relay\_enh-Core

[R2-2310780](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2310780-%20Layer-2%20specific%20part%20on%20U2U%20Relay.docx) Layer-2 specific part on U2U Relay Qualcomm Incorporated discussion NR\_SL\_relay\_enh-Core

[R2-2310925](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2310925_Discussion_on_Relay_reselection_Discovery.docx) Discussion on Relay (re)selection and Discovery Ericsson España S.A. discussion Rel-18

[R2-2310926](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2310926_Control_Plane_Procedures_for_L2_U2U_relays.docx) Control Plane Procedures for Layer 2 UE-to-UE Relays Ericsson España S.A. discussion Rel-18

[R2-2311017](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2311017_SL%20Relay_U2U_OpenIssues_FhG.docx) Discussion on remaining issues on U2U Relaying Fraunhofer IIS, Fraunhofer HHI discussion Rel-18 NR\_SL\_relay\_enh

[R2-2311038](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2311038_U2U_relay.docx) Considerations for U2U L2 relay operations Kyocera discussion

[R2-2311114](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Docs\R2-2311114.zip) Discussion on U2U relay Kyoto University, SHARP discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2311174](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2311174%20SRAP%20design%20for%20U2U%20sidelink%20relay.docx) SRAP design for U2U Sidelink Relay: remaining issues Samsung R&D Institute UK discussion

[R2-2311175](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2311175-U2U.doc) remaining issues for U2U relay Sharp discussion Rel-18 NR\_SL\_relay\_enh-Core

### 7.9.3 Service continuity enhancements for L2 UE-to-network relay

Inter-gNB direct/indirect path switching; intra-gNB indirect/indirect path switching; and inter-gNB indirect/indirect path switching, to be supported by reuse of solutions for the other scenarios.

Idle/inactive relay

[R2-2310349](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2310349%20Path%20switching%20to%20IDLE%20or%20INACTIVE%20relay%20UE.doc) Discussion on path switching to IDLE/INACTIVE relay Apple discussion Rel-18 NR\_SL\_relay\_enh-Core R2-2307856

Proposal 1: As same as Rel-17, Rel-18 Layer-2 U2N Remote UE supporting to be handed over to an IDLE/INACTIVE target relay UE is a UE capability.

Proposal 2: L2 Remote UE not supporting “handed over IDLE/INACTIVE target relay” feature only reports CONENCTED candidate relay(s)’ measurements to its serving gNB.

Proposal 3: RRC state of L2 U2N relay UE is included in U2N relay discovery announcement/response message.

Discussion:

Qualcomm want to understand if it reuses the Rel-17 capability or introduces a new one; they understand no new enhancement in this respect. Xiaomi have the same understanding that no new capability is needed. Lenovo agree, and on P2, they think there is no need to exclude the idle/inactive candidates and the gNB can filter based on the RRC state.

Huawei think P3 is not needed; the gNB can filter.

Samsung are OK to reuse the Rel-17 capability flag, but on P2/P3, they see that they are linked and would prefer not to introduce new signalling/functionality.

Kyocera support P2/P3 because the source gNB does not necessarily know the state of the target relay UE.

Nokia agree with Samsung and Huawei that the target gNB knows, and the source only needs to forward the UE capability to the target.

InterDigital understand that the agreement in Rel-17 to have the gNB filter is based on the intra-gNB case, and it would be better to have the additional information.

Qualcomm think we can rely on the gNB.

ZTE support all three proposals, and they agree with InterDigital that the source gNB needs to know if the remote UE can switch to a given target when it chooses the target gNB.

Apple understand that an error case is possible where the source gNB chooses a target gNB that then has no eligible candidate relay UE, and the source gNB cannot sensibly choose the target gNB without knowing the state of the relay UEs.

NEC wonder if we include the RRC state in discovery, whether it would impact a Rel-17 remote UE doing intra-gNB path switch. Qualcomm understand that we do not need any enhancement for a Rel-17 UE, and they do not want to have impact to the relay UE

Ericsson think P3 is an optimisation and the existing mechanisms can work.

LG think the candidate relay UE reporting can be restricted due to signalling load.

Huawei think there is no problem for the gNB; it can bring the target UEs to RRC\_CONNECTED if needed.

OPPO agree that the current mechanism works and changes would be an optimisation.

Lenovo agree with Huawei and think the target gNB can page the target relays.

Xiaomi think if the relay UE changes RRC state, it will result in a lot of signalling, so they want to avoid this scenario.

CMCC think P3 is not needed and might introduce RAN3 impact.

Kyocera wonder if the source gNB can choose multiple candidate target gNBs, and they understand we agreed to have the state transition initiated by the remote UE.

Agreements:

Same as Rel-17, Rel-18 Layer-2 U2N Remote UE supporting to be handed over to an IDLE/INACTIVE target relay UE is a UE capability.

Reuse the Rel-17 capability flag.

RRC state is not indicated in discovery signalling; the remote UE reports all candidate relay UEs.

Proposal 4: RAN2 discuss how to reduce the “x-to-indirect” path switching latency for IDLE/INACTIVE target relay case in Rel-18.

Discussion:

Apple think we have too many messages for this case and it will be a performance problem. Ericsson have some sympathy for this view; they think paging solutions can be considered, and it is a bit fuzzy that we do not exclude them clearly today.

Xiaomi think the gNB can already page the RRC\_INACTIVE UE, so this is only an issue for RRC\_IDLE, and they do not see this as a very big problem.

Nokia agree with Apple that the delay is a problem, and they think it may make a difference to whether the feature can work.

Qualcomm think this proposal is valid also for intra-gNB, and we should not take it as part of the WI. Huawei agree.

Ericsson think we do not explicitly exclude the inactive case, but there are some cases where it may not work if the relay UE has not reported its L2ID. They would be OK to consider it as a TEI.

Proposal 5: Rel-18 L2 remote UE only stops T420 timer for IDLE/INACTIVE relay case when the realy UE indicates that the indirect path is fully ready (i.e. via PC5-RRC notification message from the target relay UE).

Proposal 6: RAN2 discuss how to ensure the early detection of “target IDLE/INACTIVE relay UE has reselected a different cell” error case in Rel-18.

Measurement events and emergency cause value

[R2-2309823](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2309823_Remaining%20issues%20on%20service%20continuity%20enhancement%20for%20L2%20U2N%20relay.docx) Remaining issues on service continuity enhancement for L2 U2N relay vivo discussion

Measurement Event Z1

Proposal 1a For i2i path switch procedure, if the U2N Remote UE has available SL-RSRP measurement results with the serving U2N Relay UE, it applies the SL-RSRP threshold configured for threshold1 and the SD-RSRP threshold configured for threshold2 to evaluate measurement event Z1.

Proposal 1b For i2i path switch procedure, if the U2N Remote UE has no available SL-RSRP measurement results with the serving U2N Relay UE, it applies the SD-RSRP threshold configured for threshold1 and the SD-RSRP threshold configured for threshold2 to evaluate measurement event Z1.

Discussion:

Lenovo understand we agreed that there are separate thresholds, and if the threshold is associated with a received RSRP type, the UE should apply that one. So they understand that the proposals are not needed.

InterDigital think these proposals diverge from where we were going last meeting; they think for P1b, it is not clear how the network would know how to configure the second threshold. Samsung have the same understanding.

Qualcomm wonder if we would require the gNB to provide both thresholds always.

vivo think we should have clear UE behaviour for the case that SL-RSRP is not available.

Xiaomi understand the intention is to prioritise SL-RSRP over SD-RSRP when both are available, and they would rather leave it to UE implementation. Huawei also think it can be left to UE implementation.

Measurement Event X1

Proposal 2 For inter-gNB i2d path switch procedure, separate thresholds for SL-RSRP and SD-RSRP can be configured for the threshold1 in measurement event X1.

Proposal 3a For inter-gNB i2d path switch procedure, if the U2N Remote UE has available SL-RSRP measurement results with the serving U2N Relay UE, it applies the SL-RSRP threshold configured for threshold1 and the Uu RSRP threshold value configured for threshold2 to evaluate measurement event X1.

Proposal 3b For inter-gNB i2d path switch procedure, if the U2N Remote UE has no available SL-RSRP measurement results with the serving U2N Relay UE, it applies the SD-RSRP threshold configured for threshold1 and the Uu RSRP threshold configured for threshold2 to evaluate measurement event X1.

Measurement Event X2

Proposal 4 For inter-gNB i2d path switch procedure, separate thresholds for SL-RSRP and SD-RSRP can be configured for the threshold in measurement event X2.

Proposal 5a For inter-gNB i2d path switch procedure, if the U2N Remote UE has available SL-RSRP measurement results with the serving U2N Relay UE, it applies the SL-RSRP threshold configured for threshold to evaluate measurement event X2.

Proposal 5b For inter-gNB i2d path switch procedure, if the U2N Remote UE has no available SL-RSRP measurement results with the serving U2N Relay UE, it applies the SD-RSRP threshold configured for threshold to evaluate measurement event X2.

Agreements:

For i2i and i2d path switch procedures, the U2N remote UE applies the SL-RSRP threshold when measuring SL-RSRP and the SD-RSRP threshold when measuring SD-RSRP.

Both SL-RSRP and SD-RSRP thresholds are expected to be available to the UE. FFS signalling details (e.g., if the second one defaults to be equal to the first).

Other Mobility Enhancements

Proposal 6 RAN2 to deprioritize discussion on the following mobility issues to support U2N Remote UE’s path switch in Rel-18.

 simultaneous relay UE’s inter-gNB HO and connected remote UE’s path switching

 selection of relay UE in RRC\_IDLE or RRC\_INACTIVE state

 relay UE’s cell reselection or HO during indirect path switching of the remote UE

 prolonged inter-gNB signaling over Xn interface for inter-gNB path switching

 CHO-like path switching solution for remote UE

 DAPS like path switch solution for remote UE

 group handover for relay UE and remote UE(s)

FFS issue on emergency cause value

Proposal 7 The Relay UE’s upper layer interactions between NAS layer and ProSe layer would guarantee that Rel-18 U2N Relay UE in RRC\_IDLE or RRC\_INACTIVE sets emergency cause value provided by its NAS layer in case of emergency service relaying in SL-RLC1 case for path switch. No RAN2 spec impact is foreseen.

Discussion:

Apple would prefer to have it handled by upper layers. Xiaomi agree.

OPPO think the upper layer does not currently support passing the cause value to AS layer for this case, so they see upper-layer spec impact if we agreed this. vivo do not see spec impact.

Section 2.3

[R2-2310702](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2310702%20SL%20Relay%20Service%20Continuity.docx) SL Relay service continuity considerations Nokia, Nokia Shanghai Bell discussion Rel-18 NR\_SL\_relay\_enh-Core

Proposal 3.1: RAN2 agree that a solution is needed to remove the ambiguity of the measured RSRP values of the serving L2 U2N relay in the reports provided by the L2 U2N remote UE.

Proposal 3.2: RAN2 to discuss how to enhance the value reported in sl-MeasResult to remove the ambiguity on the reported value:

1) Adding a new flag that indicates whether the reported value is an SL-RSRP or an SD-RSRP

2) Reporting a compensated value instead of the measured SL-RSRP:

2a) The measured SL-RSRP is increased, by the reporting UE by the offset provided for discovery or by the difference of SL-RSRP and SD-RSRP thresholds provided for Z1.

2b) The measured SL-RSRP is increased, by the reporting UE by the difference between its maximum and the actually used transmission power over the given PC5 unicast link.

2c) The measured SL-RSRP is increased, by the reporting UE, by the value corresponding to the pathloss over the given PC5 unicast link.

Discussion:

Huawei think the previous agreements on the use of thresholds and choice of which quantity to report are enough.

Samsung share Nokia’s concern and think the measurements should be disambiguated for the network.

LG think think the gNB cannot differentiate which value is being reported today.

Apple agree with LG and Samsung.

ZTE agree with Nokia and think the gNB should know what is reported; they think a CHOICE structure can be used.

Qualcomm note that in Rel-17, the gNB does not know, and they wonder what the new issue is. Nokia understand we acknowledged that there was some issue in Rel-17, but it was only for relay selection and i2d path switch, and now we have more use cases.

OPPO think the problem is not critical, since the ambiguity only affects the serving relay; they do not see that the gNB needs to know which quantity was measured, only if the serving relay has gone bad.

InterDigital see some value in informing the network.

CATT understand that the handling of discovery and communication are not the same, so the gNB will adapt the resource allocation and parameters differently; they agree with Nokia that this was an issue already in Rel-17.

Xiaomi think this is easy to resolve with different fields for the two quantities, so the cost is minimal.

Huawei wonder how it will be useful for the network. OPPO agree, and to CATT’s comment on resource allocation and power control, they think this report is only used for path switching, so it is not related.

Nokia intend it to be for relay reselection and path switching; if a relay is reported and the network does not know if it is SL-RSRP and SD-RSRP, the network may misinterpret the signal strength and trigger a path switch that is not optimal. The alternative would be for the UE to compensate somehow.

CATT think the gNB will use different parameters for power control and event definition, but they cannot be completely decoupled. They see the proposal as aligned with the legacy reporting mechanism.

OPPO understand that Nokia intend to compare the serving relay with a candidate relay, but since the two have different thresholds, they think there will never be such a direct comparison. Nokia understand that the different thresholds are to allow independent control of how often reports happen.

Ericsson wonder if the intention is to authenticate what the UE is sending in case it reports something different from what was expected. Otherwise they are not sure what the network will do differently based on the indication.

InterDigital understand that the network knows the event was triggered, and it could be expected to use the information to compare two relays; if one relay is reported in terms of SL-RSRP and the other in terms of SD-RSRP, the comparison is not clear. But they wonder how critical the issue is.

Samsung think there will be some procedural spec impact.

Agreement:

The L2 U2N Remote UE indicates whether it is reporting SL-RSRP and SD-RSRP. ASN.1 details and procedural impact to be worked out in CR implementation.

[R2-2309614](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2309614%20Further%20Consideration%20on%20Service%20Continuity%20Enhancements.docx) Further Consideration on Service Continuity Enhancements CATT discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2309971](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2309971%20Discussion%20on%20L2%20U2N%20Relay%20service%20continuity.doc) Discussion on L2 U2N Relay service continuity Samsung discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2309977](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2309977_Remaining%20issues%20on%20service%20continuity.doc) Further discussion on service continuity for SL relay ZTE, Sanechips discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2310227](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2310227%20Additional%20text%20proposal%20for%20the%20introduction%20of%20R18%20SL%20relay%20service%20continuity%20in%20TS%2038.331.docx) Additional text proposal for the introduction of R18 SL relay service continuity in TS 38.331 China Telecom discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2310257](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2310257%20Remaining%20issues%20on%20service%20continuity.docx) Remaining issues on service continuity CMCC discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2310286](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2310286_Discussion%20on%20Remaining%20Issues%20of%20Service%20Continuity.docx) Discussion on Remaining Issues of Service Continuity NEC Corporation discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2310771](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2310771.doc) Service continuity enhancements for UE sidelink relay Sony discussion Rel-18 NR\_SL\_relay\_enh

[R2-2310927](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2310927_Discussion_on_Inter_gNB_Service_Continuity.docx) Discussion on Inter-gNB Service Continuity Ericsson España S.A. discussion Rel-18

[R2-2311008](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2311008.docx) Discussion on Service Continuity Huawei, HiSilicon discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2311176](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2311176-SLR_enh_core%20Remaining%20issues%20for%20i2i%20path%20switching.doc) Remaining issues for i2i path switching Sharp discussion Rel-18 NR\_SL\_relay\_enh-Core

### 7.9.4 Multi-path relaying

Mechanisms to support multi-path scenarios where a UE is connected to the same gNB using one direct path and one indirect path via 1) Layer-2 UE-to-Network relay, or 2) via another UE (where the UE-UE inter-connection is assumed to be ideal). This agenda item will include a rapporteur contribution summarising open issues from RAN2#121 (invited contribution not counted against the tdoc limit).

Including report of [Post123][407][Relay] Path addition/change in multi-path for scenario 1 (Apple)

Email discussion report

[R2-2310350](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2310350%20Summary%20of%20Path%20addition-change%20in%20MP%20Scenario1%20V25_Rapp_final.docx) Summary of [Post123][407][Relay] Path addition/change in multi-path for Scenario 1 Apple discussion Rel-18 NR\_SL\_relay\_enh-Core

Easy:

[Easy]Proposal 1: [19/20] The order of RRCReconfiguration of Relay UE and Remote UE in direct path addition/change signalling procedures are up to NW implementation.

[Easy]Proposal 2: [20/20] The legacy start condition of T304 timer as “Upon reception of RRCReconfiguration message including reconfigurationWithSync for the MCG which does not include sl-PathSwitchConfig“ and the legacy stop condition as “Upon successful completion of random access on the corresponding SpCell” can be reused for T304 timer in direct path addition/change.

[Easy]Proposal 3: [17/20] The remote UE falls back to the configuration/operation prior to direct path addition/change at the expiry of T304 timer. FFS if any spec impact

[Easy] Proposal 5 [18/20] Support Remote UE initiating the RRC reestablishment procedure at the expiry of T304 timer.

Discussion:

Qualcomm think P5 obviates P3; it may not make sense to fall back and re-establish both. Apple indicate this is the reason for the FFS in P3.

Huawei understand this is legacy behaviour; the UE already reverts back and initiates RRC re-establishment.

Ericsson wonder if there is a difference because of having the indirect path; in legacy operation there is no indirect path. Apple understand that the UE will do cell selection and re-establish.

OPPO think the key point is for the remote UE to fall back to the previous cell and indicate in re-establishment that it is coming from that cell, but this is legacy behaviour. vivo have the same understanding.

Ericsson wonder if there is a difference because of the indirect path: Here the UE still has access to the network, and they think not using the existing indirect path is a departure from legacy procedures.

Qualcomm think there is complexity for the UE to have different behaviour for the same timer, and it should just re-establish as legacy.

Samsung tend to agree with Ericsson that we have the indirect path and could use it to recover the connection.

Nokia think we cannot assume that the indirect path still works; the gNB may have misunderstood something that caused the reconfiguration failure.

Ericsson wonder why we need P3; if we do not trust the indirect path, we could just go straight into re-establishment.

LG see no big difference from legacy operation and think there might be no spec impact.

[Easy] Proposal 7 [19/20] No need to specify the order of remote UE sending of PC5-RRC trigger (for triggering relay UE enter CONNECTED) and the transmission of RRCReconfigurationComplete in the direct path, for the indirect path addition/change case when PC5-RRC trigger is needed.

[Easy]Proposal 10: [14/18] One way signalling (from remote UE to relay UE) is used for PC5-RRC message triggering IDLE/INACITVE relay entering CONNECTED. FFS whether RemoteUEInformationSidelink or a new signaling is used.

Discussion:

Xiaomi understand this signalling can only be sent after an exchange of RRCReconfigurationSidelink, so they wonder if we can include it in that message.

Apple have some concern about complexity if the reconfiguration is used; they think we should avoid needing a failure/complete message. Chair wonders if it is a “can’t fail” operation.

Kyocera think there could be a failure in case the relay UE reselects to a different cell.

[Easy]Proposal 11: [15/20] For PC5-RRC message to trigger relay UE to enter CONNECTED nothing extra is included (besides the information to distinguish the trigger from legacy usage if existing PC5-RRC signalling is reused).

[Easy]Proposal 12: [14/20] PC5-RRC trigger is NOT used for CONNECTED relay.

Discussion:

Apple indicate that some companies felt the trigger could be sent unconditionally/blindly.

Xiaomi think the issue is that the remote should not have to know the RRC state of the relay UE, in line with what we decided in service continuity.

InterDigital have the same view; it hinges on knowledge of the RRC state.

Nokia have a different understanding: It does not necessarily depend on explicit signalling of the RRC state, and they think we could agree the principle and discuss further how to achieve it. Apple indicate something could be included in the path switch command.

InterDigital think we already have duplication to determine whether the UE uses the PC5 message, and this would introduce an additional indication; if the network wants the UE to use PC5 signalling, it can configure the bearers. OPPO have a similar understanding.

Qualcomm think it is an optimization.

Samsung note that the network knows the state of the relay UE, so they understand that it can configure SRB1 appropriately with no additional enhancement.

[Easy]Proposal 14: [20/20] PC5-RRC trigger is NOT to be used when (the duplicated) RRCReconfiguraitonComplete is sent via indirect path.

[Easy]Proposal 15: [19/20] The start condition of new T420-like timer is “Upon reception of the RRCReconfiguration message including sl-IndirectPathAddChange”.

[Easy]Proposal 19: [15/19] The remote UE falls back to the configuration/operation prior to indirect path addition/change at the expiry of new T420-like timer. FFS whether/how to handle the path change case that the prior indirect path is released before the T420 expiry.

[Easy]Proposal 20: [15/19] The remote UE reports the failure of indirect path addition/change to gNB at the expiry of T420-new like timer. FFS whether this is conditional on the available of SRB1 in direct path.

[Easy]Proposal 22: [14/19] The remote UE may not initiate RRC reestablishment procedure upon the expiry of new T420-like timer. FFS whether this is conditional on the availability of SRB1 in direct path.

[Easy]Proposal 23: [19/19] For path addition/change cases in MP Scenario 1, RRCReconfgurationComplete is always transmitted in direct path. Only if NW configures split SRB1 with PDCP duplication, RRCReconfigurationComplete message is sent to gNB via both paths.

Agreements:

The order of RRCReconfiguration of Relay UE and Remote UE in direct path addition/change signalling procedures are up to NW implementation.

The legacy start condition of T304 timer as “Upon reception of RRCReconfiguration message including reconfigurationWithSync for the MCG which does not include sl-PathSwitchConfig“ and the legacy stop condition as “Upon successful completion of random access on the corresponding SpCell” can be reused for T304 timer in direct path addition/change.

At T304 expiry in direct path addition/change, the remote UE triggers re-establishment, indicating the source cell as the PCell before the path addition/change. FFS if any spec impact over legacy operation.

No need to specify the order of remote UE sending of PC5-RRC trigger (for triggering relay UE enter CONNECTED) and the transmission of RRCReconfigurationComplete in the direct path, for the indirect path addition/change case when PC5-RRC trigger is needed.

Signalling (from remote UE to relay UE) for PC5-RRC message triggering IDLE/INACTIVE relay entering CONNECTED to be discussed in running CR.

To be discussed:

[To discuss]Proposal 4: [13/20] Not support the remote UE reporting the failure of direct path addition/change to the gNB at the expiry of T304 timer.

[To discuss]Proposal 6: Upon T304 expiry, RAN2 to discuss whether RRC establishment is always triggered w/o any condition (11/18) or only when SRB1 in indirect path not configured/suspended (7/18).

[To discuss]Proposal 8: [10/20] RAN2 to discuss whether/how to avoid/handle the case when the target L2 MP Relay UE establishes a RRC connection with a different gNB than the gNB serving the target cell.

[To discuss]Proposal 9: [10/10] If the error case in P8 is to be addressed, remote UE reports the “wrong gNB” failure to PCell after the failure is detected. FFS how remote UE detects this failure (e.g., differentiate this case with the case that relay UE reselects another cell under the same gNB).

[To discuss]Proposal 13: [9/13] Rely on NW indication to remote UE whether PC5-RRC trigger is used or not. FFS whether this indication can be relay UE RRC state.

[To discuss]Proposal 16: [10/20] The T420-like timer stop condition of IDLE/INACTIVE relay case depends on whether RRCReconfguraitonComplete is sent via indirect path or not, assuming legacy Rel-17 T420 condition can be reused if yes.

[To discuss]Proposal 17: [13/20] Dowon-select one of the following for the T420-like timer stop condition of IDLE/INACTIVE relay addition/change (at least for the case that RRCReconfguraitonComplete is not sent via indirect path):

- Option 1: upon PC5-RRC connection establishment

- Option 2: Upon PC5 RLC acknowledgement of the PC5-RRC message triggering relay UE entering CONNECTED state

- Option 3: upon reception of RRCReconfigurationCompleteSidelink

[To discuss]Proposal 18: RAN2 to discuss whether the T420-like timer stop condition of CONNECTED relay case is as same as legacy Rel-17 T420 stop condition (11/20) or same as condition(s) in IDLE/INACTIVE case, if applicable.

[To discuss]Proposal 21: [10/15] If indirect path add/change failure is to be reported, include the indication of failure and the reason causing the indirect path failure in the report (assuming indirect path failure is implicitly or explicitly indicated by the report message) .

* [AT123bis][429][Relay] Remaining proposals from path addition/change discussion (Apple)

Scope: Discuss the remaining proposals from R2-2310350, and P3 of R2-2310781, and attempt to converge.

Intended outcome: Report to Thursday CB session in R2-2311392

Deadline: Thursday 2023-10-12 1100 CST

Schedule: Wednesday 2023-10-11 1600-1700 (not using Brk3, discussion in coffee break space)

[R2-2311392](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Inbox\R2-2311392.zip) Offlien-429 Summary Apple discussion Rel-18 NR\_SL\_relay\_enh-Core

[For agreement:]

Proposal 1: PC5-RRC trigger is NOT to be used when (the duplicated) RRCReconfigurationComplete is sent via indirect path.

Proposal 2: The start condition of new T420-like timer is “Upon reception of the RRCReconfiguration message including sl-IndirectPathAddChange”.

Proposal 3: For path addition/change cases in MP Scenario 1, RRCReconfgurationComplete is always transmitted in direct path. Only if NW configures split SRB1 with PDCP duplication, RRCReconfigurationComplete message is sent to gNB via both paths.

[Working assumption] Proposal 4:Upon T304 expiry for direct path addition/change, RRC reestablishment is always triggered w/o any condition

Proposal 5: If RRCReconfigurationComplete is transmitted in indirect path, reuse R17 Legacy T420 stop condition (i.e., PC5 RLC ACK of RRCReconfigurationComplete in indirect path) for new T420-like timer. Else, down-select from the following options for the stop condition:

Option 1: PC5 connection is established (i.e., PC5-S unicast link establishment procedure is complete) .

Option 2: upon reception of RRCReconfigurationCompleteSidelink

Proposal 6: The remote UE reports the failure of indirect path addition/change to gNB at the expiry of new T420-like timer.

Proposal 7: If indirect path add/change failure is to be reported, at least include the indication of failure. FFS which message is used.

Discussion:

On P4, Xiaomi think there is no blocking issue to also reporting the failure on the indirect path.

On P1, Ericsson wonder what the spec impact would be. Xiaomi suggest we could reverse the wording for clarity.

Agreements:

PC5-RRC trigger is used only when RRCReconfigurationComplete is not sent via indirect path (NOT to be used when the duplicated RRCReconfigurationComplete is sent via indirect path).

The start condition of new T420-like timer is “Upon reception of the RRCReconfiguration message including sl-IndirectPathAddChange”.

For path addition/change cases in MP Scenario 1, RRCReconfgurationComplete is always transmitted in direct path. Only if NW configures split SRB1 with PDCP duplication, RRCReconfigurationComplete message is sent to gNB via both paths.

If RRCReconfigurationComplete is transmitted in indirect path, reuse R17 Legacy T420 stop condition (i.e., PC5 RLC ACK of RRCReconfigurationComplete in indirect path) for new T420-like timer. Else, down-select next meeting from the following options for the stop condition:

Option 1: PC5 connection is established (i.e., PC5-S unicast link establishment procedure is complete).

Option 2: upon reception of RRCReconfigurationCompleteSidelink.

The remote UE reports the failure of indirect path addition/change to gNB at the expiry of new T420-like timer.

If indirect path add/change failure is to be reported, at least include the indication of failure. FFS which message is used.

Working assumption:

Upon T304 expiry for direct path addition/change, RRC reestablishment is always triggered w/o any condition

[For discussion:]

Proposal 8: RAN2 to discuss whether/how to avoid/handle the case when the target L2 MP Relay UE establishes a RRC connection with a different gNB than the gNB serving the target cell.

Discussion:

Apple indicate that some companies felt we should do something more sophisticated than the re-establishment solution from Rel-17. Xiaomi think the Rel-17 behaviour can be the baseline and we can further investigate alternatives, but they think it would be strange to handle this case in Rel-17 but not Rel-18.

Huawei think the difficult part is whether we consider “wrong gNB” rather than “wrong cell”: How does the remote UE know the relay UE has moved to a different gNB? vivo have the same concern.

Samsung think we can agree that we do not need to trigger re-establishment from the remote UE if there is a notification message from the relay UE, and it may be possible for the remote UE to extract the gNB ID from the cell ID. vivo note the gNB ID is optional.

LG think the gNB ID could be used when available, and unlike Rel-17, we have multi-path and this could be interpreted as an indirect path failure. They think we may not conclude now and it is not a WI critical issue.

Qualcomm wonder how frequent the case is.

ZTE think the gNB ID may not be applicable for the remote UE, since the remote UE is not mandated to receive the SI of the relay UE’s cell before the PC5 link is established.

Xiaomi think we could handle it as a “wrong cell” case with the Rel-17 behaviour. Ericsson have a similar understanding and think the UE decoding the gNB ID is not a good solution; they would prefer a simple re-establishment.

vivo observe that “wrong cell” does not mean “wrong gNB”. Samsung wonder how we determine when a cell is “wrong”.

Kyocera understood in Rel-17, we did re-establishment when the relay UE reselected to another cell, even of the same gNB.

LG wonder how the remote UE detects the cell change. Huawei think the relay UE could report it before establishing the RRC connection.

Agreement:

Upon the MP relay UE cell change to a different cell from the target cell commanded by the gNB, the remote UE considers that there has been an indirect path change/addition failure. It is left to UE implementation how the remote UE detects this case.

Proposal 9: If the error case in P8 is to be addressed, remote UE reports the “wrong gNB” failure to PCell after the failure is detected. FFS how remote UE detects this failure (e.g., differentiate this case with the case that relay UE reselects another cell under the same gNB).

Proposal 10: RAN2 discusses whether Rel-17 Relay UEs can be considered as candidate target Relay UEs.

Discussion:

Apple suggest that we could agree to the principle and work out the details next meeting. Ericsson think this is not critical, but they are OK with the proposal; however, they think we should look at the solution.

OPPO think we should see the solution before concluding anything.

Qualcomm think there is no technical concern, and we could take the principle and work on the details.

LG think we could take a WA, and it would allow us to avoid release differentiation.

vivo are also concerned about needing to see the solution.

Xiaomi understand the concern about release differentiation, but they think it may not be necessary; in any case they think we can revert the WA if there is a problem.

Working assumption:

Rel-17 relay UEs can be considered as candidate target UEs for MP procedures.

Case G in scenario 2 (discussed jointly)

[R2-2310258](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2310258%20Discussion%20on%20indrect%20path%20change%20in%20scenario%202.docx) Discussion on indrect path change in scenario 2 CMCC, Huawei, HiSilicon, Qualcomm, ZTE, NEC, Samsung, Lenovo discussion Rel-18 NR\_SL\_relay\_enh-Core

Proposal 1: RAN2 confirm the working assumption to support case G for scenario 2 for RRC\_CONNECTED target relay UE.

Proposal 2: Support reporting multi candidate relay UEs in scenario 2.

Proposal 3: Support RRC\_IDLE and RRC\_INACTIVE candidate relay UEs reporting in scenario 2.

Proposal 4: For scenario 2, remote UE reports a new ID (other than C-RNTI) and serving cell ID (e.g., NCGI) for idle/inactive relay UE. The new ID is bit string format, how to assign/exchange the ID between remote UE and relay UE on ideal link is out of 3GPP.

Proposal 5: Remote UE can trigger the RRC\_IDLE/RRC\_INACTIVE relay UE to move into RRC\_CONNECTED state after receiving the indirect path configuration which indicates the relay UE ID during indirect path addition/change.

[R2-2310351](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2310351%20Discussion%20on%20indirect-path%20change%20in%20Scenario%202_r2.doc) Discussion on Case G Support in Multi-path Scenario 2 Apple, Ericsson, Nokia, Nokia Shanghai Bell, Kyocera, LG Electronics discussion Rel-18 NR\_SL\_relay\_enh-Core

Proposal 1 For Case G indirect path switch, Remote UE reports only a single relay UE for NW to consider.

Proposal 2 IDLE/INACTIVE relay UE is not supported in Case G and Case A.

Discussion:

Ericsson think multiple reporting can only allow the network to make a random choice, and the remote UE should pick the right candidate.

CMCC indicate that if we support multiple connected relay UEs, the network can select on Uu conditions.

Nokia tend to agree with Ericsson that selection based on Uu link quality is basically random, but they can accept multiple reporting with connected UEs only.

LG think if we have multiple reporting, we also have to agree that there is no separate signalling for triggering the target indirect path establishment.

Samsung think for connected relay UEs, the gNB has enough information to make a choice, but for idle/inactive the remote UE has better information.

Ericsson think multiple reporting is not well motivated technically, but they can accept majority view.

MediaTek wonder if priority information from the remote UE would help.

Qualcomm wonder what the concern is for idle/inactive state; is it just the ID? They think the I-RNTI could be used for RRC\_INACTIVE.

Nokia understand that for scenario 2, there is a reliable connection between remote and relay, but we included RLM for symmetry with scenario 1; they think we should not diverge from scenario 1 now. They can accept no idle/inactive relay UE for progress, but think we should not have additional information reported.

LG think the whole balance of agreements is important, and idle/inactive would require considering additional information that is not available at the gNB side. InterDigital have a similar view.

Samsung wonder how the remote UE knows the state of the relay UE. vivo think it can be handled outside of our specs over the ideal link.

Kyocera wonder if the number of reported UEs could be configurable by the network. Xiaomi think this was previously discussed and not agreeable; they think it can be up to UE implementation.

Qualcomm would like a restriction that the remote UE should not trigger the relay UE to enter connected state before reporting. Apple think this is out of scope because of the ideal link.

Agreements:

Confirm WA to support case G in scenario 2 at least for connected relay UEs.

Multiple candidate relay UEs can be reported. Signalling format to be determined in CR implementation.

The indirect path addition/change can be triggered by the reporting of candidate relay UEs, subject to network implementation (no additional signalling for this purpose).

Reporting of idle/inactive relay UEs is not supported in Rel-18.

P1-P12

[R2-2310781](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2310781-open%20issues%20for%20MP%20relay.docx) Open issues on multi-path relay for scenario 1 and scenario 2 Qualcomm Incorporated discussion NR\_SL\_relay\_enh-Core

Trigger Relay UE entering connected state

Proposal 1: If split SRB1 is configured, the Remote UE send RRCReconfigurationComplete message over both of direct and indirect paths; If split SRB1 is not configured, then the Remote UE can send PC5-RRC message to trigger Relay UE to enter connected state.

Proposal 2: A new PC5-RRC message or parameter needs to be introduced to trigger Relay UE into CONNECTED state.

Proposal 3: RAN2 discusses whether Rel-17 Relay UEs can be considered as candidate target Relay UEs.

Proposal 4: Relay UE indicates whether to 1) support and 2) need PC5-RRC triggering in discovery message (i.e. AS container). Send LS to SA2 and CT1.

Proposal 5: If only Rel-18 Relay UEs are considered as candidate target Relay UEs, then the Remote UE only reports Rel-18 candidate Relay UEs to the gNB;

Proposal 6: If both of Rel-17 and Rel-18 Relay UEs are considered, the Remote UE indicates Relay UE’s release info or whether support PC5-RRC triggering to the gNB.

Path failure handling

Proposal 7: No additional IE needs to be introduced in MCGFailureInformation message for reporting direct-path failure via indirect-path.

Proposal 8: For both of Scenario-1 and 2, reuse SidelinkUEInformationNR message to report indirect path failure to gNB.

Proposal 9: For scenario 2, add a new indication in SidelinkUEInformationNR message to report indirect path failure.

Path addition, removal and change

Proposal 10: No new measurement report events will be introduced for indirect/direct path addition, removal or change.

Authorization for Scenario 2

Proposal 11: Authorization for Scenario-2 MP relay is needed and Scenario-2 MP relay shares the same authorization information with Scenario-1 informed to the gNB.

Proposal 12: UE radio capabilities to support Scenario-1 MP relay and Scenario-2 MP relay are separate.

Discussion:

Qualcomm think P3 is important. Apple can take this into the offline discussion.

Ericsson think P11 will not work, and it would be better to leave it to network implementation based on a UE capability. They understand that the scenario 1 authorization framework depends on ProSe capabilities.

LG have the same view as Ericsson from their SA2 colleagues.

vivo think there is no ambiguity from gNB point of view.

Ericsson think we could have a capability for scenario 2, but not reuse the authorization.

Qualcomm think network implementation cannot handle it.

Ericsson understand that SA2 have confirmed this issue is outside their scope; they see no alternative to leaving it to network implementation.

Samsung wonder if the network would need to know the type of UE-to-UE link to determine how to use the authorization.

CMCC have the same concern as Qualcomm.

LG think we would have to go back to SA2 if we do not leave it to network implementation, and the SA2 LS indicated that they could not do it.

Agreements:

UE capabilities to support Scenario-1 MP relay and Scenario-2 MP relay are separate.

Authorization for scenario 2 MP relay is left to network implementation.

Other documents

[R2-2309588](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2309588%20Discussion%20on%20Path%20addition%20and%20change%20for%20multipath%20Scenario-1.docx) Discussion on Path addition and change for multipath Scenario-1 NEC discussion NR\_SL\_enh2

[R2-2309615](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2309615_Remaining%20issues%20on%20Multi-path.docx) Remaining issues on Multi-path CATT discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2309681](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2309681%20-%20Discussion%20on%20control%20plane%20procedure%20of%20multi-path%20Relay.docx) Discussion on control plane procedure of multi-path relay OPPO discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2309682](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2309682%20-%20Discussion%20on%20user%20plane%20procedure%20of%20multi-path%20Relay.docx) Discussion on user plane procedure of multi-path relay OPPO discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2309756](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2309756%20Discussion%20on%20issues%20for%20Multi-path%20relaying.doc) Discussion on remaining issues for multi-path relaying LG Electronics France discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2309804](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2309804.docx) Discussion on multi-path scenario 1 Xiaomi discussion

[R2-2309805](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2309805.docx) Discussion on multi-path scenario 2 Xiaomi discussion

[R2-2309824](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2309824_Remaining%20Issues%20for%20Multi-path.docx) Remaining Issues for Multi-path vivo discussion

[R2-2309825](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2309825_Authorization%20for%20Multi-path%20Scenario%202.docx) Authorization for Multi-path Scenario 2 vivo, Qualcomm incorporated discussion

[R2-2309888](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2309888%20Remaining%20issue%20on%20BSR%20reporting%20for%20Multi-path%20Scenario%202.docx) Remaining issue on BSR reporting for Multi-path Scenario 2 ASUSTeK discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2309928](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2309928%20Failure%20handling%20in%20indirect%20path%20addition%20and%20change%20v2.0.docx) Failure handling in indirect path addition and change Lenovo discussion Rel-18

[R2-2309929](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2309929%20Discussion%20on%20direct%20path%20addition%20v1.0.docx) Discussion on direct path addition Lenovo discussion Rel-18

[R2-2309978](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2309978%20Further%20discussion%20on%20the%20support%20of%20multi-path%20relaying.docx) Further discussion on the support of multi-path relaying ZTE, Sanechips discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2309980](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2309980_SLRelay_v1.0.docx) Discussion on remaining issues on multiple path for sidelink relay Samsung discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2310013](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2310013%20Discussion%20on%20multi-path%20relaying.doc) Discussion on multi-path relaying Spreadtrum Communications discussion Rel-18

[R2-2310160](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2310160%20Discussion%20on%20Multi-path%20relaying.docx) Discussion on Multi-path relaying Lenovo discussion NR\_SL\_relay\_enh-Core

[R2-2310169](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2310169%20(R18%20SL%20Relay%20WI_AI794%20MultipathAspects_UP).doc) Remaining User Plane Aspects for Multipath InterDigital discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2310170](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2310170%20(R18%20SL%20Relay%20WI_AI794%20MultipathAspects_CP).doc) Remaining Control Plane Aspects for Multipath InterDigital discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2310259](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2310259%20Remaining%20issues%20on%20multi-path.docx) Remaining issues on multi-path CMCC discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2310287](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2310287_Discussion%20on%20UP%20Issues%20of%20Multi-path%20Relaying.docx) Discussion on UP Issues of Multi-path Relaying NEC Corporation discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2310352](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2310352%20Discussion%20on%20remaining%20issues%20on%20Multi-path.doc) Discussion on remaining issues for Multi-path Relay Apple discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2310468](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2310468_Discussion%20on%20multi-path%20scenario%201_III.docx) Discussion on multi-path scenario 1 III discussion NR\_SL\_relay\_enh

[R2-2310487](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2310487%20CP%20remaining%20issues%20on%20multi-path%20operation.docx) CP remaining issues on multi-path operation Huawei, HiSilicon discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2310488](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2310488%20UP%20remaining%20issues%20on%20multi-path%20operation.docx) UP remaining issues on multi-path operation Huawei, HiSilicon discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2310772](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2310772.doc) Multi-path relaying discussion Sony discussion Rel-18 NR\_SL\_relay\_enh

[R2-2310815](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2310815%20Discussion%20on%20control%20plane%20open%20issues%20of%20multi-path%20relaying.docx) Discussion on control plane open issues of multi-path relaying China Telecom discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2310876](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2310876%20DIscussion%20on%20Mpath.docx) Discussion on Multi-path Nokia, Nokia Shanghai Bell discussion NR\_SL\_relay\_enh-Core

[R2-2310928](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2310928_Discussion_on_multipath%20relays.docx) Discussion on Multipath Relays Ericsson España S.A. discussion Rel-18

[R2-2311039](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2311039_multipath_relay.docx) Considerations for multipath relay operations for Scenario 1 Kyocera discussion

[R2-2311109](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2311109%20Discussion%20on%20user%20plane%20open%20issues%20of%20multi-path%20relaying.docx) Discussion on user plane open issues of multi-path relaying China Telecom discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2311177](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2311177-MP1.doc) remaining issues for multi-path relay Sharp discussion Rel-18 NR\_SL\_relay\_enh-Core

[R2-2311178](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2311178-MP2.doc) scenario 2 specific issues for multi-path relay Sharp discussion Rel-18 NR\_SL\_relay\_enh-Core

### 7.9.5 DRX

Study the gains and, if needed, specify signalling between gNB and relay UE in sidelink mode 2 to assist the determination of the sidelink DRX configuration used for remote UE. This agenda item will be handled at lower priority.

## 7.24 TEI18

Specific items may be allocated to a breakout session for treatment.

Time budget: 1 TU

### 7.24.1 TEI proposals by Other Groups

Items initiated by other groups that is/has been communicated by LS, where the other group indicate this is TEI18. (Specific other-group-WIs should use the R18 Other Agenda Item below).

### 7.24.2 TEI proposals by RAN2

Items initiated in RAN2 for NR and LTE.

Tdoc limitation: 1 tdoc, limitation only applicable for non-previously-agreed-to-be-considered TEI proposals.   
proposals that has been agreed or agreed to be considered are not limited by the tdoc limitation.

Relay: Emergency cause value

[R2-2309684](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2309684%20-%20Discussion%20on%20emergency%20cause%20value%20for%20SL%20Relay.docx) Discussion on emergency cause value for SL Relay OPPO discussion Rel-18 NR\_SL\_relay\_enh-Core, TEI18

* [AT123bis][430][TEI18] Relay emergency cause value (OPPO)

Scope: F2F offline to determine if RAN2 impact is needed for handling of emergency cause value with relays.

Intended outcome: Report to Thursday CB session in R2-2311393

Deadline: Thursday 2023-10-12 1300 CST

Schedule: Thursday 2023-10-12 1030-1100 CST, in Brk3

[R2-2311393](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Inbox\R2-2311393.zip) [AT123bis][430][TEI18] Relay emergency cause value (OPPO) OPPO discussion Rel-18 NR\_SL\_relay\_enh-Core, TEI18

[Proposed WF:]

Send LS S2/C1: based on R2 discussion, R2 identified two approaches 1) upper layer provides the information of emergency link for relay case, and R2 will set emergency cause value accordingly, or 2) upper layer provides the emergency cause value for relay case directly. R2 would like C1 to decide which approach to use, and feedback to R2.

Relay: Paging cause forwarding

[R2-2309795](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2309795_Discussion%20on%20MUSIM%20paging%20cause%20forwarding.docx) Discussion on MUSIM paging cause forwarding vivo discussion Rel-18

* Noted

Proposal 1 Relay UE (connected with a MUSIM remote UE) can report to NW whether it support MUSIM paging, as described in ANNEX TP.

Discussion:

Huawei wonder if the network includes a field that the UE does not understand, how the UE will handle this case. They understand that the UE should ignore it, so they are not sure if this relay UE behaviour is really useful.

Lenovo have the same understanding as Huawei: If the relay UE receives this paging cause IE, it will ignore it.

vivo understand that this is a relay UE capability.

Xiaomi wonder how the relay UE knows if there is a connected MUSIM remote UE. vivo understand that the network determines from the UE capability, and the relay UE just forwards what it receives.

OPPO have the same concern as Xiaomi; since the legacy paging records use different IEs, the relay UE needs to know which paging record it decodes.

Positioning: BT AoA/AoD

[R2-2310853](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2310853%20Bluetooth.docx) Adding support for Bluetooth AoA/AoD Ericsson, AT&T, Polaris Wireless, u-blox, T-Mobile discussion Rel-18

Proposal 1 Discuss and agree to introduce support for Bluetooth AoA/AoD positioning in the LPP Bluetooth positioning method

Proposal 2 Endorse the draft CR in the Appendix

Discussion:

Qualcomm generally agree that AoA measurements should be added, but we cannot control the BT radio using LPP.

Ericsson agree that we cannot control the BT radio, and the intention is not to control it but to suggest parameters. Qualcomm do not see a real difference if we are providing detailed BT radio parameters, and they think we cannot specify how BT obtains the measurements.

Ericsson think we could take the measurements as a baseline. They also think BT SIG specifies mechanisms for the device to be controlled.

Agreements:

Support Bluetooth AoA/AoD positioning in the LPP Bluetooth positioning method.

Introduce BT AoA/AoD measurements in LPP.

FFS if further BT control information can be captured in our specs.

* [AT123bis][431][TEI18] Bluetooth AoA/AoD positioning (Ericsson)

Scope: Discuss the details of Bluetooth AoA/AoD and how much device control can be captured in RAN2 specs.

Intended outcome: Report to Thursday CB session in R2-2311394

Deadline: Thursday 2023-10-12 1300 CST

Schedule: Thursday 2023-10-12 1100-1130 CST, in Brk3

[R2-2311394](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2311394%20Bluetooth%20AoA-AoD.docx) [AT123bis][431][TEI18] Bluetooth AoA/AoD positioning (Ericsson) Ericsson discussion Rel-18

Proposal 1 Discuss draft CR and “control” in a post meeting email discussion.

Discussion:

Huawei are not sure about the need for stage 2 impact, and they think a more detailed explanation would be useful, but they do not see the need for a post-meeting discussion now.

Qualcomm agree that there will be a lot of post-meeting discussions, and they think we should have a CR in line with the agreements before pursuing the details.

AT&T think this is worth pursuing.

Ericsson think the needed changes are not dramatic compared to the CR that was already seen.

* [Post123bis][403][POS] BT AoA/AoD (Ericsson)

Scope: Draft and review a CR implementing the agreements from RAN2#123bis on Bluetooth AoA/AoD positioning.

Intended outcome: Report and CR to next meeting

Deadline: Long

Positioning: Remote UEs

[R2-2310544](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2310544%20Discussion%20on%20issues%20for%20SFN-DFN%20offset%20procedure%20in%2038.331.docx) Discussion on issues for SFN-DFN offset procedure in 38.331 ZTE Corporation discussion Rel-18 TEI18

[R2-2310855](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2310855%20Relay.docx) Forwarding on posSIBs relaying to remote UE [PosL2RemoteUE] Ericsson CR Rel-18 38.331 17.6.0 4354 - B TEI18

* [AT123bis][432][TEI18] Positioning for remote UEs (ZTE)

Scope: Discuss R2-2310544 and R2-2310855 and determine a way forward to produce updated CRs for next meeting.

Intended outcome: Report to Thursday CB session in R2-2311395

Deadline: Thursday 2023-10-12 1300 CST

Schedule: Thursday 2023-10-12 0900-0930 CST, in Brk3

[R2-2311395](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2311395%20Report%20of%20%5bAT123bis%5d%5b432%5d%5bTEI18%5d%20Positioning%20for%20remote%20UEs%20(ZTE).docx) [AT123bis][432][TEI18] Positioning for remote UEs ZTE Corporation discussion Rel-18 TEI18

Agreements:

Agree to change the sidelink RRC reconfiguration trigger condition, as the TP in R2-2310544

Agree to add the UE behavior when the remote UE receives the RRCReconfigurationSidelink message with SL-SFN-DFN-Offset, as the TP in R2-2310544

Do not agree on issue 3 in R2-2310544.

Use SetupRelease structure to provide SFN-DFN offset to remote UE.

To change the sl-FrameOffset, sl-SubframeOffset and sl-SlotOffset value to start from 0 and make these fields mandatory.

For the next meeting, P1, P4 and P5 are captured by the original CR author; P2 is provided as a separate CR.

Agree with the first change in R2-2310855.

Agreements to be captured in an update of the existing AIP CR (except P2 as noted above).

## 7.25 R18 Other

Specific items may be allocated to a breakout session for treatment.

Impacts from Other RAN WGs and TSGs that has no separate TU budget in RAN2. LS ins for Rel-18 specific WIs/SIs that has no RAN WI.

Time budget: 2 TU

Tdoc Limitation: -

### 7.25.1 RAN4 led items

### 7.25.2 RAN1 led items

E.g. MC enhancements, DSS

### 7.25.3 Other

RAN3, SA2, SA3, CT1 led items and others, e.g. eNPN, Slicing.

PRUs (considered in offline [402])

[R2-2310854](C:\\Users\\mtk16923\\Documents\\3GPP Meetings\\202310 - RAN2_123bis, Xiamen\\Extracts\\R2-2310854 PRU.docx" \o "C:\Users\mtk16923\Documents\3GPP Meetings\202310 - RAN2_123bis, Xiamen\Extracts\R2-2310854 PRU.docx) On the Positioning Reference Units aspects [PRU] Ericsson, vivo discussion Rel-18

[R2-2310920](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202310%20-%20RAN2_123bis,%20Xiamen\Extracts\R2-2310920_(PRU%20Stage%202).docx) Clarification of PRU measurement reporting Qualcomm Incorporated CR Rel-18 38.305 17.6.0 0146 - C 5G\_eLCS\_Ph3