3GPP TSG-RAN WG2 Meeting #129 R2-25xxxxx

Athens, Greece, 17-21 February 2025

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

## 4.3 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).

Tdoc Limitation: 1 tdoc

# 5 NR Rel-15 and Rel-16

Essential corrections only.

Tdoc Limitation: 2 tdocs in total for all sub agenda items NOTE: some agenda items have additional Tdoc limits.

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 treated 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)

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.

Tdoc Limitation: 1 tdoc

R2-2500817 Correction on SP positioning SRS (de-)activation MAC CE Huawei, HiSilicon CR Rel-16 38.321 16.18.0 2034 - F NR\_pos-Core

* Not pursued

Discussion:

vivo think the first change is incorrect because C indicates the BWP ID if it is different from the serving cell, E is always mandatory if the extension is there, and the two should not be linked. The second part they think is already clear in the current spec.

Xiaomi tend to agree with vivo and do not see the need to describe the E=0 case; they also think there is no case where E is absent.

Huawei indicate that when BWP is missing, the E field will also not be populated, hence the linkage; on the second part, they think the spec is open if E=0 now.

Samsung are fine with the second change, but they think the first part is already clear that C indicates the presence of the octet including E. CATT have the same understanding.

Ericsson think the change is not an essential correction, and we should not be doing clarifications on Rel-16 at this point. They agree that the meaning of the E bit is already clear.

Qualcomm agree with Ericsson and note that E was a reserved bit before, so it should be quite clear what the UE does when it is 0, and it cannot be absent as such.

[R2-2500818](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202502%20-%20RAN2_129%2C%20Athens%5CExtracts%5CR2-2500818%20Correction%20on%20SP%20posSRS%20de-activation%20MAC%20CE-r17.docx) Correction on SP positioning SRS (de-)activation MAC CE Huawei, HiSilicon CR Rel-17 38.321 17.11.0 2035 - A NR\_pos-Core

* Not pursued

[R2-2500819](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202502%20-%20RAN2_129%2C%20Athens%5CExtracts%5CR2-2500819%20Correction%20on%20SP%20posSRS%20de-activation%20MAC%20CE-r18.docx) Correction on SP positioning SRS (de-)activation MAC CE Huawei, HiSilicon CR Rel-18 38.321 18.4.0 2036 - A NR\_pos-Core

* Not pursued

# 6 NR Rel-17

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

Tdoc limitation: 4 Tdocs

## 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))

CRs

[R2-2500908](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202502%20-%20RAN2_129%2C%20Athens%5CExtracts%5CR2-2500908%20Miscellaneous%20corrections%20for%20Rel-17%20SL%20relay.docx) Miscellaneous corrections for Rel-17 SL relay ZTE Corporation, Sanechips CR Rel-17 38.331 17.11.0 5243 - F NR\_SL\_relay-Core

* Not pursued

Discussion:

CATT think this is more category D. ZTE indicate that the third correction is substantive and they think it justifies category F.

Huawei agree that the corrections are editorial, and they think adding the field description is not needed because the procedural text for the events is already clear. They do not think the CR is wrong but think the bar for Rel-17 should be higher than this. Nokia agree with Huawei.

[R2-2500909](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202502%20-%20RAN2_129%2C%20Athens%5CExtracts%5CR2-2500909%20Miscellaneous%20corrections%20for%20Rel-17%20SL%20relay-mirror.docx) Miscellaneous corrections for Rel-17 SL relay ZTE Corporation, Sanechips CR Rel-18 38.331 18.4.0 5244 - A NR\_SL\_relay-Core

* Not pursued

New proposals outside WI scope

R2-2500316 RRC Connection Establishment for Multihop-Parallel Relay IIT, Kharagpur discussion Rel-17

[R2-2500325](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202502%20-%20RAN2_129%2C%20Athens%5CExtracts%5CR2-2500325.docx) Data distribution and HARQ management for multihop-parallel relay topology in 5G NR IIT, Kharagpur discussion Rel-17

## 6.3 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))

R2-2500602 Correction on spatial relation info in SP SRS activation deactivation MAC CE (R17) ZTE Corporation, Ericsson, Qualcomm, CATT, Samsung, vivo, Nokia, Xiaomi CR Rel-17 38.321 17.11.0 1977 2 F NR\_pos\_enh-Core R2-2410985

* Agreed

[R2-2500603](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202502%20-%20RAN2_129%2C%20Athens%5CExtracts%5CR2-2500603%20Correction%20on%20spatial%20relation%20info%20in%20SP%20SRS%20activation%20deactivation%20MAC%20CE%20%28R18%29.docx) Correction on spatial relation info in SP SRS activation deactivation MAC CE (R18) ZTE Corporation, Ericsson, Qualcomm, CATT, Samsung, vivo, Nokia, Xiaomi CR Rel-18 38.321 18.4.0 1978 2 A NR\_pos\_enh-Core R2-2410986

* Agreed

[R2-2500813](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202502%20-%20RAN2_129%2C%20Athens%5CExtracts%5CR2-2500813%20Correction%20to%20BDS%20issue%20of%20data%20indication-r17.docx) Correction to BDS issue of data indication Huawei, HiSilicon CR Rel-17 37.355 17.9.0 0546 - F NR\_pos\_enh-Core

* Not pursued

Discussion:

CATT would prefer not to modify the earlier releases and we can start from the new signal in Rel-19. Ericsson agree with CATT and think there is not a real risk of confusion.

Qualcomm agree with the CR and think the issue arose from the B1c introduction; they understand that the Toe field just identifies the instance of ephemeris and does not need explicit units. They also have some concern that this happened in NavIC too.

Xiaomi agree with Qualcomm but also agree with CATT and Ericsson’s point that there is no critical change, so they would be OK with fixing it from Rel-19. They think it can be handled in the BDS and NavIC WIs.

[R2-2500814](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202502%20-%20RAN2_129%2C%20Athens%5CExtracts%5CR2-2500814%20Correction%20to%20BDS%20issue%20of%20data%20indication-r18.docx) Correction to BDS issue of data indication Huawei, HiSilicon CR Rel-18 37.355 18.4.0 0547 - A NR\_pos\_enh-Core

* Not pursued

[R2-2500815](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202502%20-%20RAN2_129%2C%20Athens%5CExtracts%5CR2-2500815%20Correction%20to%20PRS%20priority%20subset%20for%20DL-AoD-r17.docx) Correction to PRS priority subset for DL-AoD Huawei, HiSilicon, Ericsson, VIVO, Samsung CR Rel-17 38.305 17.7.0 0182 - F NR\_pos\_enh-Core

* Title of affected line in table to change to “PRS priority list for measurement reporting”
* Agreed with this change as R2-2501422

Discussion:

ZTE wonder if the UE-based mode can provide measurements along with the location estimate; if so, they see that the priority subset could also apply to UE-based. Huawei understand that LPP supports reporting both, but the priority subset is only useful for measurements.

CATT wonder why the LMF should be forbidden to provide the subset for UE-based; they understand that all assistance information could be made available.

Ericsson see that the CR does not prohibit signalling the information, but it clarifies that it is designed for UE-assisted mode.

Qualcomm think this is a problem with the unified PRS assistance data; they think the stage 2 clarification is fine as long as LPP works properly, and they understand that the intention was to inform the UE of the priority of reporting the measurements.

CATT understand from RAN1 colleagues that there was no discussion there of whether to exclude the UE-based case, and they think that UE-based can also use the information subject to UE implementation.

vivo agree with the CR and think in the UE-based case, the UE may have its own preference for the measurements and the network does not need to provide it.

Xiaomi agree with Qualcomm that the intention of the priority is to control reporting, and the UE implementation can control how it performs the actual measurements, so they think the intention of the CR is correct. However, they do not think there is anything broken in Rel-17 and the RAN1 description is already clear. They think TEI19 would be appropriate.

Huawei think there is consensus that the current spec is wrong.

Lenovo think it would be a bit inconsistent to leave it in Rel-17/18 but change it in Rel-19.

Xiaomi support a perfect specification but think we should not take unnecessary CRs for issues that are not critical. Huawei think this is more than just a clarification because something is actually wrong in the spec.

ZTE understand that the issue is what the UE would do with the information in UE-based mode, and maybe a NOTE could be captured saying that it is up to UE implementation what to do if it is provided.

Qualcomm would prefer to take the CR but have some modifications to clarify the table in general; they think it is not clear for a reader. They think we could change to “PRS priority list for measurement reporting”, and they think changing from Rel-19 would create confusion.

[R2-2500816](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202502%20-%20RAN2_129%2C%20Athens%5CExtracts%5CR2-2500816%20Correction%20to%20PRS%20priority%20subset%20for%20DL-AoD-r18.docx) Correction to PRS priority subset for DL-AoD Huawei, HiSilicon, Ericsson, VIVO, Samsung CR Rel-18 38.305 18.4.0 0183 - A NR\_pos\_enh-Core

* Title of affected line in table to change to “PRS priority list for measurement reporting”
* Agreed with this change as R2-2501423

# 7 Rel-18

## 7.1 Expanded and improved NR positioning

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

Time budget: 0 TU

Tdoc Limitation: 1 tdoc

Minor and editorial issues should be coordinated with the appropriate spec rapporteur and submitted by rapporteur company together with any additional corrections the rapporteur company may have. Larger issues can be discussed based on contributions/individual CRs.

### 7.1.1 Organizational

Including incoming LSs and rapporteur inputs.

R2-2500007 Reply LS on CBR range (R1-2410708; contact: CATT) RAN1 LS in Rel-18 NR\_pos\_enh2-Core To:RAN2

* Noted

Discussion:

Huawei think the issue is not so critical.

[R2-2500276](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202502%20-%20RAN2_129%2C%20Athens%5CExtracts%5CR2-2500276%20Correction%20of%20SL%20CBR%20Range%20and%20level%20parameters.docx) Corrections of SL CBR Range and level related parameters CATT, Ericsson CR Rel-18 38.331 18.4.0 5204 - F NR\_pos\_enh2-Core

* Not pursued (related agreement in minutes)

Discussion:

Huawei think this issue arises elsewhere and we should not specify restrictions that are already there in the ASN.1 ranges.

Xiaomi wonder about the consequence if we do not change: Can the network still indicate 64 to the UE, and if so, what happens? They understand that we should capture the change if it affects UE behaviour.

ZTE agree with the CR because there was an error during the running CR implementation, and the alternative as seen last meeting was an extensive ASN.1 change.

Xiaomi note that this is a UE specification, and we should capture what we need the UE behaviour to reflect. They want to clarify that this CR does not force a change to UE implementation, and they think we could capture in the minutes that this case is up to UE implementation.

Ericsson understand that we should address the recommendations of the RAN1 LS, but they agree we could capture something in the notes.

Agreement:

If the NW configures a maximum value for sl-CBR-ConfigIndexDedicatedSL-PRS-RP, sl-DefaultTxConfigIndexDedicatedSL-PRS-RP, or sl-PRS-TxConfigIndex that goes beyond the actual list sizes, the handling is up to UE implementation.

### 7.1.2 Stage 2

Impact to 38.300, 37.340, and 38.305.

This agenda item may be handled at lower priority.

### 7.1.3 SLPP corrections

Impact to 38.355.

R2-2500845 Missing additional measurements for SL-TDOA and SL-TOA Qualcomm Incorporated CR Rel-18 38.355 18.4.0 0009 1 F NR\_pos\_enh2-Core R2-2408513

* Request field name should include “perARP” and be clarified in the field description
* -r18 suffix to be removed
* Coversheet issues to be addressed
* Revised in R2-2501424

Discussion:

Huawei think the CR is fine in general, but they think the request should be per ARP. Qualcomm understand that the same number of measurements for each ARP is correct. Huawei agree but think the request field name could be changed to indicate per ARP.

Xiaomi agree with Huawei’s point.

Lenovo wonder if we should have the -r18 suffix since it is the first release, and if we should have the affected architecture options on the coversheet.

* [AT129][402][POS] CR check on additional measurements for SL positioning (Qualcomm)

 Scope: Revise and check the CR in R2-2500845.

 Intended outcome: Agreed CR (without CB if possible) in R2-2501424

 Deadline: Wednesday 2025-02-19 1900 EET

### 7.1.4 LPP corrections

Impact to 37.355.

### 7.1.5 RRC corrections

Impact to 38.331 and 38.306.

R2-2500166 RRC Sidelink Positioning Correction Fraunhofer IIS, Fraunhofer HHI, Ericsson CR Rel-18 38.331 18.4.0 5201 - F NR\_pos\_enh2-Core

Discussion:

vivo understand that we have not discussed IUC for SL positioning and the IUC configuration should not be modified to support SL positioning now. Ericsson think in this case we would need the CR but not the second change.

ASUSTeK think IUC should be applicable, so they support the intention of the change, but they think the first sentence needs clarification to say it applies for data transmission generically.

Huawei support the change because the previous text clearly restricts the field only to shared resource pool; on the use of IUC, they checked the WID and they understand that it should be supported.

Samsung agree with Ericsson and think the first change is enough, with no need to add the additional sentence. CATT agree.

Xiaomi agree with Samsung, but they think there is an interoperability concern. Ericsson indicate that there is no UE-to-NW interoperability issue, but there can be problems if one UE implements and the other does not, and this is reflected in the coversheet.

vivo note that we did not discuss IUC in this context, and they would like to postpone to check with RAN1 colleagues. Huawei think the CR is correct anyway, because the restriction to shared resource pool was wrong.

Ericsson understand that we need to take the first change to restore legacy operation, and the second part can be postponed.

ZTE think we could postpone the whole CR. They are also concerned about the mention of SL-PRS in the unchanged sentence at the end of the field description.

* [AT129][403][POS] IUC for SL-PRS (Ericsson)

 Scope: Check the need for the CR in R2-2500166 and update if necessary.

 Intended outcome: Agreeable CR in R2-2501425

 Deadline: Wednesday 2025-02-19 1900 EET

R2-2501425 RRC Sidelink Positioning Correction Fraunhofer IIS, Fraunhofer HHI, Ericsson CR Rel-18 38.331 18.4.0 5201 1 F NR\_pos\_enh2-Core

[R2-2500277](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202502%20-%20RAN2_129%2C%20Athens%5CExtracts%5CR2-2500277%20Corrections%20on%20activation%20of%20non-preconfigured%20SRS%20with%20the%20type%20of%20semi-persistent.docx) Corrections on activation of non-preconfigured SRS with the type of semi-persistent CATT, Ericsson, Qualcomm Incorporated, ZTE Corporation, Samsung CR Rel-18 38.331 18.4.0 5205 - F NR\_pos\_enh2-Core

Discussion:

Huawei think we need to clarify where the trigger comes from: If it is from upper layers, they think the change is in the wrong place. They agree that some change is needed, but they think this change is written as if the trigger comes from RRC itself.

Ericsson think this issue was discussed during drafting of the RRC CR, and they are not sure how upper layers would learn about the SRS configuration. They understand that the spec currently has support for both cases, but how the RRC gets the information could be up to UE implementation.

Huawei think there is confusion about the procedure at a stage 2 level and we may need to consult the SA2 spec; they would be willing to have an offline discussion to check this.

Xiaomi are not sure there is a stage 2 issue; they understand the trigger does come from upper layer to do the positioning operation and the RRC layer decides if resume is needed, but they see the interaction as up to implementation and think the current CR is sufficient.

CATT understand the divergence is about the interaction between AS and upper layer, and if there is doubt, an offline might be worthwhile.

Ericsson would prefer not to have an offline discussion about functional issues for a frozen release; they would rather postpone and allow companies to check offline.

Xiaomi think the issues being discussed are UE implementation. CATT think we could confirm this offline, and if we just postpone the CR we will come back to the same discussion next meeting.

* [AT129][404][POS] CR check on non-preconfigured SP-SRSp activation (CATT)

 Scope: Check the CR in R2-2500277 and revise if necessary, taking into account procedural requirements from upper layers to evaluate what needs to be specified vs. left to UE implementation.

 Intended outcome: Agreeable CR in R2-2501426

 Deadline: Wednesday 2025-02-19 1900 EET

R2-2501426 Corrections on activation of non-preconfigured SRS with the type of semi-persistent CATT, Ericsson, Qualcomm Incorporated, ZTE Corporation, Samsung CR Rel-18 38.331 18.4.0 5205 1 F NR\_pos\_enh2-Core

[R2-2500812](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202502%20-%20RAN2_129%2C%20Athens%5CExtracts%5CR2-2500812%20Correction%20to%20sidelinkUEInformation%20for%20SL%20POS.docx) Correction to sidelinkUEInformation for SL-PRS shared resource pool Huawei, HiSilicon, Vivo CR Rel-18 38.331 18.4.0 5230 - F NR\_pos\_enh2

* “-Core” to be added to WI code
* Agreed as R2-2501432

Discussion:

InterDigital wonder if we need to specify something here or the NW implementation can handle it. Huawei think it is possible that the UE requests a set of frequencies larger than the frequencies requested for SL communication.

Xiaomi think the CR is OK, but the WI code should include “-Core” on the coversheet.

[R2-2500971](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202502%20-%20RAN2_129%2C%20Athens%5CExtracts%5CR2-2500971%20RRCLPHAP.docx) Low Power High Accuracy Positioning Correction Ericsson CR Rel-18 38.331 18.4.0 5252 - F NR\_pos\_enh2-Core

* Not pursued

Discussion:

vivo have some sympathy for the intention but think the LMF could also ensure that the cells in the validity area support the feature.

Huawei think this issue is similar to other features that can be requested by ResumeRequest, for which we do not set a barring bit but use other mechanisms within UAC and reselection to keep the UE from multiple requests; for instance, the NW could respond with RRCReject with a wait time or change the reselection priorities.

Xiaomi understand that we guide the network not to reject connections for an unknown cause, but they agree that there are ways for the network implementation to resolve the issue.

Ericsson think there will be latency issues if the UE tries and fails, even if the network avoids the loop, and it would be more efficient to enable a different approach like MO-LR.

Xiaomi think the network could guarantee that the feature is supported within the RNA.

Huawei think the issue only occurs in case of a configuration update request; for the initial configuration, the UE will request by MO-LR, and the network can guarantee that the cells in the RNA support it. They see the problem as a corner case and think there are other solutions.

Xiaomi think it is not a correction but an optimization.

### 7.1.6 MAC corrections

Impact to 38.321.

R2-2500513 Miscellaneous corrections on SL-PRS ASUSTeK CR Rel-18 38.321 18.4.0 2026 - F NR\_pos\_enh2-Core

Discussion:

Huawei think most of the changes are OK, but on the first change, there is a corrected field that is not used anywhere, and it could just be removed. They also agree with a comment received by the proponent that “with PRS” vs. “and PRS” does not make much difference.

ZTE think the fifth change is not needed (“with PRS” vs. “and PRS”), but they agree with the intention that both cases are decremented, so they suggest using another bullet with an “or” structure to cover both the Rel-17 and Rel-18 cases.

* [AT129][405][POS] Revision of miscellaneous SL-PRS MAC changes (ASUSTeK)

 Scope: Revise the CR in R2-2500513 to break up the bullet in the fifth change into two parts linked with “or”, and adjust the NOTE accordingly. Also remove the unused field from the first change.

 Intended outcome: Agreed CR (without CB if possible) in R2-2501427

 Deadline: Wednesday 2025-02-19 1900 EET

R2-2501427 Miscellaneous corrections on SL-PRS ASUSTeK CR Rel-18 38.321 18.4.0 2026 1 F NR\_pos\_enh2-Core

[R2-2500545](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202502%20-%20RAN2_129%2C%20Athens%5CExtracts%5CR2-2500545.docx) Correction on parameters for SL-PRS for configured grant Type 1 Sharp CR Rel-18 38.321 18.4.0 2030 - F NR\_pos\_enh2-Core

* Not pursued

[R2-2500604](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202502%20-%20RAN2_129%2C%20Athens%5CExtracts%5CR2-2500604%20Correction%20on%20SRS%20hopping%20in%20positioning.docx) Correction on SRS hopping in positioning ZTE Corporation CR Rel-18 38.321 18.4.0 2031 - F NR\_pos\_enh2

Discussion:

Lenovo want to check that there is no related procedural text in RRC, only the ASN.1 to configure the fields. ZTE indicate that there is text in the PHY spec referring to configuration by RRC signalling.

vivo think the question is whether the MAC should maintain the time window, and they think the RAN1 description is sufficient and the MAC does not need to do anything. They also note that the MAC does not describe the expiration of the timer, so they agree that the spec is not complete and it makes sense to remove the clause.

Huawei indicate that the current MAC spec does not mean the UE does not transmit SRS outside the window; it follows legacy operation, and the SRS configuration is given directly to the physical layer. So they understand that the MAC spec just says that the MAC layer indicates to PHY when the collision resolution shall happen. They agree that there is misalignment about parameter names, but they do not think it is OK to remove the procedural text in 5.32 completely.

ZTE understand that the RRC configures the window, the UE knows where the window is, and the UE just does collision handling during this window; they do not see that the MAC layer needs to do anything. They see it as analogous to the PPW, where we do not have MAC behaviour specified.

Lenovo understand that we have no procedural text in RRC for the UTW at all, and it looks a bit strange, so we should check before removing it from MAC.

Ericsson have some sympathy for the CR; we have implemented the RRC parameter list to support procedures specified in L1, and it is not clear if we need procedural text of our own for everything.

Huawei indicate that we did not define additional procedures, and MAC controls PHY normally; they see the analogy to PPW as not right because PPW affects RRC, not MAC.

Lenovo think some revision is needed anyway, at least to align parameter names.

Xiaomi agree with Lenovo.

* [AT129][406][POS] MAC spec impact for UTW (ZTE)

 Scope: Further discuss the CR in R2-2500604 and determine what MAC spec is needed to clarify the operation of the UTW.

 Intended outcome: Agreeable CR in R2-2501428 and report in R2-2501434

 Deadline: Wednesday 2025-02-19 1900 EET

### 7.1.7 Corrections to other specifications

Impact to any specifications not identified above.

## 7.5 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: 0TU

Tdoc Limitation: 1 tdoc

1 additional tdoc on top of the limit is allowed for co-sourced contribution with 3 or more companies.

Minor and editorial issues should be coordinated with the appropriate spec rapporteur and submitted by rapporteur company together with any additional corrections the rapporteur company may have. Larger issues can be discussed based on contributions/individual CRs.

### 7.5.1 Organizational

Including incoming LSs and rapporteur inputs.

### 7.5.2 Stage 2 corrections

Impact to 38.300.

### 7.5.3 Control plane corrections (including UE capabilities)

Impact to 38.331, 38.304, and 38.306.

Discussed jointly

R2-2500411 Corrections to SidelinkUEInformationNR setting and E2E SL DRB release ASUSTeK CR Rel-18 38.331 18.4.0 5208 - F NR\_SL\_relay\_enh-Core

Discussion:

Huawei agree with the first change, but for the e2e DRB handling, several companies identify some missing cases in related papers, but the solutions are different, and they think we should discuss the alternatives together.

Apple also agree with the first change; for the second and third changes, they understand that all the contents of the RRCReconfigurationSidelink should be processed, and we should be able to capture the behaviour without a long list of conditions about the current configuration, so they think we could simplify a bit. ASUS understand that this comment refers to the Huawei proposal.

OPPO understand that for the fourth change, there is a sentence in the specification saying that when the e2e release or failure occurs, the UE discards the related configurations, which seems already to cover the change. ASUS understand that in the per-hop cases the addition/modification/release procedure cannot be triggered at the relay UE without the change.

Huawei understand that the point of the fourth change is to add handling of the per-hop cases, but we agreed last meeting that these behaviours will be triggered based on the QoS information, so the relay UE will know the QoS flows are gone and will re-derive the RLC channels for the affected hop, including detecting that some RLC channels are no longer needed. They understand that the sentence pointed out by OPPO is not intended to cover the per-hop RLC channel release.

Apple think there is some overlap between the changes in terms of functionality and the fourth change may not be strictly needed.

* [AT129][408][Relay] Revision of R2-2500411 on Rel-18 relay (ASUSTeK)

 Scope: Revise the CR in R2-2500411 to have only the first change (as numbered on the coversheet).

 Intended outcome: Revised CR (without CB if possible) in R2-2501430

 Deadline: Wednesday 2025-02-19 1900 EET

[R2-2501236](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202502%20-%20RAN2_129%2C%20Athens%5CExtracts%5CR2-2501236%20Correction%20to%20UE%20information%20transfer%20on%20sidelink.docx) Correction to UE information transfer on sidelink Huawei, HiSilicon CR Rel-18 38.331 18.4.0 5270 - F NR\_SL\_relay\_enh-Core

Discussion:

OPPO think there is yet another option: to rely on upper layers to release the link if there is no remaining QoS flow. Huawei’s intention here is to release the RLC channels when all the QoS flows are gone.

Xiaomi think the whole link should be released. Nokia have the same view and understand that this will have the effect of releasing the RLC channels.

Huawei think when to establish/release the link has generally been left to UE implementation, and there is no guarantee that it will be released, so we cannot take such a decision in RAN2.

Apple consider that whether or not the link is released, the upper layers will be informed that all the DRBs are gone. They think we could do some clarification, but we do not need to send an empty message for information that the upper layer already knows.

Huawei think if we have no changes, the UE implementation can remove or keep the RLC channels, and when a new set of QoS flows comes to the relay UE, it will re-derive the RLC channels anyway. They could accept this outcome but think we should document something to avoid further corrections to the same places.

OPPO understand that if the QoS list is empty, the UE will already re-derive the RLC channels, resulting in releasing them all.

Huawei understand that the relay UE cannot release the RLC channels by itself, because there is a peer entity in the target remote UE, but here there is no trigger specified that would cause that release.

Agreement:

RAN2 understand that when all the e2e connections using a particular first-hop link fail or are released for an idle/inactive/OOC relay UE, the handling of the second-hop RLC channels is based on the information provided by upper layers. No specification impact is expected.

* [AT129][407][Relay] Revision of R2-2501236 on Rel-18 relay (Huawei)

 Scope: Check and update the CR in R2-2501236, excluding change 3 (as numbered on the coversheet) which was handled in online discussion.

 Intended outcome: Agreed CR (without CB if possible) in R2-2501429

 Deadline: Wednesday 2025-02-19 1900 EET

Other CRs

[R2-2500567](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202502%20-%20RAN2_129%2C%20Athens%5CExtracts%5CR2-2500567_38331_CR5214r0_%28Rel-18%29_%20Correction%20on%20indirect%20path%20failure%20information.docx) Correction on indirect path failure information China Telecom, Huawei, HiSilicon CR Rel-18 38.331 18.4.0 5214 - F NR\_SL\_enh2-Core

* Merged into R2-2501431

[R2-2500907](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202502%20-%20RAN2_129%2C%20Athens%5CExtracts%5CR2-2500907%20Corrections%20for%20Rel-18%20SL%20relay.docx) Corrections for Rel-18 SL relay ZTE Corporation, Sanechips CR Rel-18 38.331 18.4.0 5242 - F NR\_SL\_relay\_enh-Core

* Revised in R2-2501431

Discussion:

OPPO wonder if the fourth change is correctly captured; ZTE clarify that the clause number is different.

OPPO are not sure the last change covers the case of three legs (split bearer on Uu + multi-path relay). Nokia think we should also mention that the secondary split cannot be on the indirect path.

* [AT129][409][Relay] Revision of R2-2500907 on Rel-18 relay (ZTE)

 Scope: Revise the CR in R2-2500907 to merge in the change from R2-2500567, and check the details of the last change.

 Intended outcome: Agreed CR (without CB if possible) in R2-2501431

 Deadline: Wednesday 2025-02-19 1900 EET

[R2-2500802](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202502%20-%20RAN2_129%2C%20Athens%5CExtracts%5CR2-2500802.docx) Correction on T400 configuration Xiaomi, Apple CR Rel-18 38.331 18.4.0 5229 - F NR\_SL\_relay\_enh-Core

* Not pursued (related agreement in minutes)

Discussion:

Huawei recall that we agreed to introduce new values for the U2U cases, so they think that if the network supports U2U, it will always provide t400-u2u, but the CR seems to imply that it is allowed not to provide it.

Ericsson agree with Huawei that the field logically would be provided, but it is an OPTIONAL field; however, they think this situation occurs in other places and they are not sure that anything needs to change.

Xiaomi could accept specifying that the network always provides the U2U field.

Ericsson understand that the t400-u2u will always be present if the feature is supported.

Qualcomm agree with Xiaomi’s intention, but they think maybe something should be clarified in the procedural text rather than the field description.

Apple think t400-u2u is something of an optimization and it would be possible in principle for the network not to set it.

Nokia understand that the value is optional for the network, and the CR clarifies what the UE should do if both are provided. They think the current text is clear enough, but could be misunderstood with effort, so they can live with the change.

Xiaomi think if there is an implementation that does not comply with this CR, there will be extra SL RLFs, so it has real functional impact.

Huawei think the existing text already specifies that the UE shall use t400-u2u for U2U.

Agreement:

RAN2 understand that if the field t400-u2u is provided, the UE does not apply the value of the field t400 for end-to-end PC5 connection in UE-to-UE relaying.

### 7.5.4 User plane corrections (including SRAP)

Impact to 38.351, 38.321, 38.322, and 38.323.

# 8 Rel-19

## 8.13 NR sidelink multi-hop relay

(NR\_SL\_relay\_multihop; leading WG: RAN2; REL-19; WID: [RP-242349](http://ftp.3gpp.org/tsg_ran/TSG_RAN/TSGR_105/Docs/RP-242349.zip))

Time budget: 1 TU

Tdoc Limitation: 3 tdocs

### 8.13.1 Organizational

LSs and rapporteur input, including workplan, etc.

LG wonder if we can confirm that the extension to two additional hops is feasible.

Agreement:

From RAN2 perspective, the extension of the multihop relay WI to two additional hops is feasible with the current time allocation.

Incoming LSs with “take into account” action only

[R2-2500064](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202502%20-%20RAN2_129%2C%20Athens%5CDocs%5CR2-2500064.zip) LS on Authorization information for Layer-2 multi-hop U2N relaying to NG-RAN (S2-2501296; contact: LGE) SA2 LS in Rel-19 5G\_ProSe\_Ph3 To:RAN2, RAN3

* Noted

Discussion:

Lenovo want to clarify that the authorizations for last relay and intermediate relay are separate, and we probably need to reflect this in the UE capability.

ZTE wonder if we should provide any feedback.

[R2-2500068](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202502%20-%20RAN2_129%2C%20Athens%5CDocs%5CR2-2500068.zip) Reply LS on relay discovery announcement (S2-2501334; contact: LGE) SA2 LS in Rel-19 NR\_SL\_relay\_multihop-Core, 5G\_ProSe\_Ph3 To:RAN2

* Noted

Rapporteur CR

[R2-2500866](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202502%20-%20RAN2_129%2C%20Athens%5CExtracts%5CR2-2500866%20-%2038323_running%20CR%20for%20R19%20SL%20Relay.docx) Introduction of multi-hop U2N relay in TS 38.323 Ericsson draftCR Rel-19 38.323 18.4.0 NR\_SL\_relay\_multihop

* Noted

### 8.13.2 Relay discovery and (re)selection

Enhancements to relay dscovery and (re)selection to support one additional hop relay (remote UE ⬄ first relay UE ⬄ last relay UE ⬄ gNB). Extensibility to a second additional hop in this WI is considered as a design criterion.

P3 (cross-cell cases)

[R2-2500307](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202502%20-%20RAN2_129%2C%20Athens%5CExtracts%5CR2-2500307_RelayDisc%26Resel.docx) Considerations on relay discovery and (re)selection Samsung discussion Rel-19 NR\_SL\_relay\_multihop-Core

* Noted

Proposal 3: RAN2 is kindly asked to agree that the last relay UE over one cell cannot be operated as an intermediate relay UE towards a different cell.

Discussion:

Huawei support the proposal and think the scenario is not really necessary, because it leads us into multi-path scenarios.

ZTE also support the proposal and want to clarify that “one cell” in the proposal refers to the serving cell.

LG understand that the last relay UE cannot be connected to another cell as an intermediate relay UE under agreements we already took.

Apple do not see a technical block for the cross-cell case, especially for discovery where the UE need not be in RRC\_CONNECTED. Chair understands the proposal is more about relay operation.

OPPO also understand the proposal is about relay operation and preventing the UE from having to camp on two different cells on the same time. For the discovery part, they understand that there are serving cell details in the discovery message, so the intermediate relay should obtain SI before discovery.

Qualcomm think the proposal is specific to approach 1; they think the scenario comes for free in approach 2, and they would prefer to delay the discussion.

vivo support the proposal and understand that the relay operation begins when the UE connects to an intermediate relay.

InterDigital think we should clarify the RRC state; in RRC\_CONNECTED it looks clear, but if the UE can be in idle/inactive they agree with Apple that there may be no block.

Huawei think there is a blocking problem with authorization because UEs in idle cannot be authorized, and they think this impairs any support of approach 2.

Ericsson have some sympathy for Qualcomm’s view and think we cannot make the decision solely based on discovery.

OPPO think idle/inactive is the main point, and the idle/inactive UE would still need to acquire SI. They disagree about the operation coming for free in approach 2, because the UE would still have two camping cells.

ZTE understand that the last relay UE meets the RSRP threshold broadcasted by the serving cell, and they think a smart network will not configure overlapping thresholds for last and intermediate relays, so the scenario should not arise.

LG understand from SA2 that the intermediate relay UE can maintain a PC5 link towards only one parent UE.

Samsung agree with OPPO about the issue of camping on two different cells; this is not supported for legacy operation.

LG think approach 2 can be addressed if we agree to it under the control plane.

vivo wonder about an intermediate relay UE that moves near the centre of another cell. Chair understands it would have to either stay or be released and reconfigured.

InterDigital think the central issue is the RRC states rather than the CP approach. They think talking about paging and SI will automatically resolve this problem. They understand that the authorization applies to operation in RRC\_CONNECTED.

Huawei interpreted that the authorization is broader and the relay UEs must have authorization to operate as relays in any state.

Ericsson think authorization is not an issue for a UE not in RRC\_CONNECTED.

Samsung are concerned about the intermediate relay UE needing to receive SI from two different cells.

Agreement:

The last relay UE over one cell cannot be operated as an intermediate relay UE towards a different cell. FFS if there can be exceptions for control plane approach 2 when the intermediate relay UEs are in idle/inactive.

P4-P5 (L2IDs)

[R2-2500508](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202502%20-%20RAN2_129%2C%20Athens%5CExtracts%5CR2-2500508-Discussion%20on%20the%20discovery%20and%20relay%20%28re%29selection%20for%20multi-hop%20U2N%20relay.docx) Discussion on the discovery and relay (re)selection for multi-hop U2N relay LG Electronics Inc. discussion

* Noted

Proposal 4: In Figure 2.5A-2, the L2 ID(D) and LD ID(D’) can be the same or a difference value. If the last Relay UE reports the source L2 IDs and destination L2 IDs by using SUI, the last Relay UE should report the source-destination L2 ID pair to identify other links.

Proposal 5: In Figure 2.5B-1, the L2 ID(B) and LD ID(B’) can be the same or a difference value. if the intermediate Relay UE reports the source L2 IDs and destination L2 IDs by using SUI, the last Relay UE should report the source-destination L2 ID pair to identify other links.

Discussion:

Samsung understand the intention but wonder if there is any big problem with requiring the same ID; they are concerned that different IDs would increase the design complexity.

NEC agree with the intention but wonder if it is in RAN2 scope; should we send an LS to SA2?

vivo would prefer to have the same ID; from RAN2 pov, they think if we allow different L2IDs, it creates cross-path topologies, because a different L2ID means a “different” last relay.

OPPO understand it is not a cross-path topology, because the cross-path aspect is about upstream multi-path and this is downstream. They do not see a need for an LS to SA2, and they understand there is no spec impact to us.

LG indicate the intention is for the L2IDs for connection establishment.

Qualcomm wonder if multiple L2IDs would require multiple PC5 connections.

Agreement:

From RAN2 perspective, when an intermediate/last relay UE serves two different downstream UEs, there is no assumption on whether it presents the same or different L2IDs for connection establishment.

P4-P5 (discovery thresholds and resource pools)

[R2-2500865](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202502%20-%20RAN2_129%2C%20Athens%5CExtracts%5CR2-2500865%20-%20discussion%20on%20discovery%20and%20relay%20%28re%29selection.docx) Discussion on relay discovery and relay (re)selection Ericsson discussion Rel-19 NR\_SL\_relay\_multihop

* Noted

Proposal 4 Reuse the same Uu RSRP thresholds as in the legacy (i.e., single hop L2 U2N relay) for L2 Remote UE and L2 U2N last Relay UE in multi-hop U2N relay.

Proposal 5 Reuse the same discovery resource pool(s) and configurations as in the legacy (i.e., single hop L2 U2N relay) in multi-hop U2N relay.

Discussion:

Samsung wonder if this is intended to apply only to discovery. Ericsson indicate it is.

NEC ask is there is an assumption in P5 that the network will only configure multi-hop but not single-hop relays. Ericsson think they could coexist but differentiation may require input from SA2, because it would depend on the discovery message content.

Agreements:

Reuse the same Uu RSRP thresholds for discovery transmission as in the legacy (i.e., single hop L2 U2N relay) for L2 Remote UE and L2 U2N last Relay UE in multi-hop U2N relay.

Reuse the same discovery resource pool(s) and configurations as in the legacy (i.e., single hop L2 U2N relay) in multi-hop U2N relay.

P9-P11 (AS conditions for discovery forwarding)

[R2-2500905](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202502%20-%20RAN2_129%2C%20Athens%5CExtracts%5CR2-2500905_Discussion%20on%20multi-hop%20Relay%20discovery%20and%20%28re%29selection.doc) Discussion on multi-hop Relay discovery and (re)selection ZTE Corporation, Sanechips discussion Rel-19 NR\_SL\_relay\_multihop-Core

* Noted

Proposal 9: For Model A discovery, the intermediate relay UE forwards/propagates the discovery message when the PC5 RSRP between the relay UE and its parent relay UE is above a threshold.

Proposal 10: For Model B discovery, the intermediate relay UE forwards the discovery solicitation/response message when the PC5 RSRP between the relay UE and the UE from which the discovery solicitation/response message is received is above a configured threshold.

Proposal 11: For Model B discovery, after receiving a discovery solicitation message from an intermediate relay, the last relay UE transmits the discovery response message when the PC5 RSRP between the last relay UE and the intermediate relay is above a configured threshold.

Discussion:

ZTE clarify that they consider that the PC5 connection may exist (as indicated by SA2) even when the link quality is not good enough for discovery.

Huawei think there are two cases depending on whether there is a PC5 connection towards the parent relay UE; if so, they think no threshold is needed, and without the connection, they think we could think about having some conditions.

OPPO understand for model A, if the PC5 connection is established, the remote UE has selected the first relay and the PC5 link quality has been checked; if the link is not good, relay reselection will occur. So they understand that no threshold is needed.

Ericsson think the proposals make sense because the remote UE only considers the first hop, and the proposals allow it to evaluate the next hop.

Qualcomm think for model A, the UE does not need to check the threshold again, but for model B there is a case where the AS layer may need to check.

InterDigital agree that this is required for model B, and they think we should have similar procedures for models A and B, so they would prefer to support both.

NEC think it is strange to have the thresholds when the PC5 link is already set up.

LG support the proposals and think even though the thresholds are checked when the link is set up, the messages should not be forwarded if the link quality is not as good later. Qualcomm think in this case the link will be released.

Huawei think the link was established because the quality is good, and that should be enough for forwarding the discovery messages. ZTE wonder when the UE will check the link quality during setup.

Samsung think as long as the PC5 link is OK, the relay UE should not check the RSRP again.

OPPO understand SA2 have already agreed to have reselection by the intermediate relay UE. ZTE have the same understanding but think SA2 have not looked at any AS criteria for (re)selection.

Kyocera would like to have reselection by the intermediate relay UE.

vivo think model B may still require thresholds and SA2 did not have consensus. OPPO understand that from AS perspective, the intermediate relay UE relies on the relay path for SI and paging and acts as a remote UE, so we should allow it to perform parent reselection, which means we can have a unified mechanism for models A and B.

Agreements:

For model A discovery, there are no additional AS criteria on discovery message forwarding (the existence of the PC5 link is sufficient).

For model B discovery, if the PC5 link on which the discovery message is received has already been established, no additional AS criteria on discovery message forwarding are applied. FFS if the PC5 link is not already established.

P1 (FFS on upper RSRP threshold for intermediate relay UE)

[R2-2500724](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202502%20-%20RAN2_129%2C%20Athens%5CExtracts%5CR2-2500724%20Relay%20discovery%20and%20%28re%29selection.docx) Relay discovery and (re)selection Nokia discussion NR\_SL\_relay\_multihop R2-2410288

Proposal 1. In Rel-19 multi-hop relay, RAN2 prioritizes the same cell scenario, and the last relay UE should not operate as an intermediate relay UE.

P8-P11 (selection/reselection criteria, reselection by remote and intermediate relay UEs)

[R2-2500192](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202502%20-%20RAN2_129%2C%20Athens%5CExtracts%5CR2-2500192%20-%20Discovery%20and%20relay%20%28re%29selection%20for%20multi-hop%20U2N%20relay.docx) Discovery and relay (re)selection for multi-hop U2N relay OPPO discussion Rel-19 NR\_SL\_relay\_multihop-Core

* Noted

Proposal 8 For multi-hop U2N relay selection at the remote UE, it reuses the trigger condition of R17 single-hop U2N relay, i.e.: 1) Direct Uu signal strength of current serving cell of the multi-hop U2N Remote UE is below a configured signal strength threshold; 2) Indicated by upper layer of the U2N Remote UE.

Proposal 9 For multi-hop U2N Relay reselection trigger at the remote UE, reuse the following R17 single-hop U2N Relay reselection trigger condition:

- PC5 signal strength of current direct connected multi-hop U2N Relay UE is below a (pre)configured signal strength threshold.

- When U2N Remote UE receives a PC5-S link release message from current direct connected multi-hop U2N Relay UE.

- When U2N Remote UE detects PC5 RLF with the current direct connected multi-hop U2N Relay UE.

- Indicated by upper layer.

Discussion:

CATT wonder about the wording of the conditions in P9; should “multi-hop U2N relay UE” be “first relay UE”?

Proposal 10 Multi-hop U2N Remote UE triggers relay reselection upon PC5-RRC signaling indicating (FFS on the detailed PC5-RRC signaling design):

- cell reselection, handover, Uu RLF, or Uu RRC connection establishment/resume failure between the multi-hop U2N Relay UE(s) and network.

- PC5 RLF/release between the multi-hop U2N Relay UE(s).

Discussion:

Qualcomm wonder if we could have some recovery without notifying the remote UE. Apple have the same understanding.

NEC think we could still notify the remote UE even if there is a recovery along the path.

Proposal 11 RAN2 to discuss intermediate relay UE performs relay (re)selection with the same trigger condition defined for the remote UE. Upon relay reselection, it sends notification to the remote UE to indicate PC5 link release with its parent relay.

Agreements:

For multi-hop U2N relay selection at the remote UE, it reuses the trigger condition of R17 single-hop U2N relay, i.e.: 1) Direct Uu signal strength of current serving cell of the multi-hop U2N Remote UE is below a configured signal strength threshold; 2) Indicated by upper layer of the U2N Remote UE.

For multi-hop U2N Relay reselection trigger at the remote UE, reuse the following R17 single-hop U2N Relay reselection trigger condition:

- PC5 signal strength of current first relay UE is below a (pre)configured signal strength threshold.

- When U2N Remote UE receives a PC5-S link release message from current first relay UE.

- When U2N Remote UE detects PC5 RLF with the current first relay UE.

- Indicated by upper layer.

L2 multi-hop U2N Remote UE in idle/inactive triggers relay reselection upon PC5-RRC signaling from the first relay UE indicating (FFS on the detailed PC5-RRC signaling design):

- cell reselection, handover, Uu RLF, or Uu RRC connection establishment/resume failure between the last relay UE and network.

- release of RRC connection between an intermediate relay UE and the network.

- PC5 RLF or PC5-S connection release between the multi-hop U2N Relay UE(s).

- FFS: link quality degradation of the upstream links resulting in a notification.

- FFS if any of these conditions can occur without notifying the remote UE (e.g., allowing recovery by the intermediate relay UE).

- FFS on the signalling contents of the PC5-RRC indication from the first relay UE.

- FFS applicability to L3.

* [AT129][410][Relay] Intermediate relay UE (re)selection (vivo)

 Scope: Evaluate whether (re)selection by the intermediate relay UE is required, considering SA2 input and proposals to this meeting.

 Intended outcome: Report to CB session in R2-2501433

 Deadline: Wednesday 2025-02-19 1900 EET

 Schedule: Tuesday 2025-02-18 1630-1700, in Brk1

R2-2501433 (Report from [410]) vivo discussion Rel-19 NR\_SL\_relay\_multihop-Core

Other contributions

[R2-2500122](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202502%20-%20RAN2_129%2C%20Athens%5CExtracts%5CR2-2500122%20Discussion%20for%20U2N%20multi-hop%20relay%20discovery%20and%20relay%20reselection.docx) Discussion on multi-hop U2N relay discovery and relay selection NEC discussion Rel-19 NR\_SL\_relay\_multihop-Core

[R2-2500187](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202502%20-%20RAN2_129%2C%20Athens%5CExtracts%5CR2-2500187%20Discussion%20on%20Multi-hop%20Discovery%20and%20%28Re%29selection.docx) Discussion on Multi-hop Discovery and (Re)selection CATT discussion Rel-19 NR\_SL\_relay\_multihop-Core

[R2-2500420](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202502%20-%20RAN2_129%2C%20Athens%5CExtracts%5CR2-2500420%20One%20remaining%20issue%20on%20multi-hop%20U2N%20Relay%20Discovery%20message%20forwarding.docx) One remaining issue on multi-hop U2N Relay Discovery message forwarding ASUSTeK discussion Rel-19 NR\_SL\_relay\_multihop

[R2-2500432](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202502%20-%20RAN2_129%2C%20Athens%5CExtracts%5CR2-2500432%20Discussion%20on%20relay%20discovery%20and%20selection.docx) Relay discovery and selection for Multi-hop UE-to-NW Relay Apple discussion Rel-19 NR\_SL\_relay\_multihop

[R2-2500497](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202502%20-%20RAN2_129%2C%20Athens%5CExtracts%5CR2-2500497%20%28R19%20SL%20Relay%20WI_AI8132%20RelayDiscoverySelection%29.doc) Discovery and Relay (Re)Selection for Multi-hop U2N Relays InterDigital discussion Rel-19 NR\_SL\_relay\_multihop

[R2-2500570](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202502%20-%20RAN2_129%2C%20Athens%5CExtracts%5CR2-2500570_Consideration%20on%20multi-hop%20relay%20discovery%20and%20reselection.docx) Consideration on multi-hop relay discovery and reselection China Telecom discussion Rel-19 NR\_SL\_relay\_multihop-Core

[R2-2500632](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202502%20-%20RAN2_129%2C%20Athens%5CExtracts%5CR2-2500632%20Relay%20%28re%29selection%20in%20Multi-hop%20relay%20v2.doc) Relay (re)selection in Multi-hop relay Lenovo discussion Rel-19

[R2-2500700](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202502%20-%20RAN2_129%2C%20Athens%5CExtracts%5CR2-2500700%20Relay%20discovery%20and%20%28re%29selection%20for%20multi-hop%20Relay.docx) Relay discovery and (re)selection for multi-hop Relay Huawei, HiSilicon discussion Rel-19 NR\_SL\_relay\_multihop-Core

[R2-2500723](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202502%20-%20RAN2_129%2C%20Athens%5CExtracts%5CR2-2500723%20Draft%20LS%20on%20legacy%20UE%20participation%20in%20multi-hop%20UE%20communica.docx) [Draft] LS on legacy UE participation in multi-hop UE communication Nokia LS out NR\_SL\_relay\_multihop To:SA2

[R2-2500753](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202502%20-%20RAN2_129%2C%20Athens%5CExtracts%5CR2-2500753.docx) Multi-hop relay selection/re-selection Sony discussion Rel-19 NR\_SL\_relay\_multihop-Core

[R2-2500933](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202502%20-%20RAN2_129%2C%20Athens%5CExtracts%5CR2-2500933_relay_discovery_reselection.docx) Discovery and (re)selection under multihop relay Kyocera discussion

[R2-2501118](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202502%20-%20RAN2_129%2C%20Athens%5CExtracts%5CR2-2501118_Discussion%20on%20topology%20and%20intermediate%20relay%20UE%20%28re%29selection.docx) Discussion on topology and intermediate relay UE (re)selection vivo discussion Rel-19

[R2-2501174](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202502%20-%20RAN2_129%2C%20Athens%5CExtracts%5CR2-2501174%20SL%20selection.docx) Relay discovery and (re)selection TCL discussion

[R2-2501183](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202502%20-%20RAN2_129%2C%20Athens%5CExtracts%5CR2-2501183-MH-reselection.docx) discussion on Relay discovery and (re)selection for multi-hop relay Sharp discussion Rel-19 NR\_SL\_relay\_multihop-Core

[R2-2501259](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202502%20-%20RAN2_129%2C%20Athens%5CExtracts%5CR2-2501259-Discovery%20and%20Relay%20%28re%29selection%20for%20multi-hop%20U2N%20relay.docx) Discovery and Relay (re)selection for multi-hop U2N relay Qualcomm Incorporated discussion NR\_SL\_relay\_multihop-Core

### 8.13.3 Control Plane Procedures and SRAP impact

Contributions should focus on control plane procedures and can include SRAP impact and QoS handling to support additional hops.

Including outcome of email discussion [Post128][401][Relay] Control plane baseline solution (InterDigital)

* [AT129][401][Relay] SRAP for Rel-19 multihop relay (OPPO)

 Scope: F2F offline for advance discussion of header format in SRAP. Related proposals from R2-2500194 / R2-2500434 / R2-2500701 / R2-2500913 / R2-2501184 can be taken into account but need not be treated exhaustively.

 Intended outcome: Report to Wednesday session in R2-2501421

 Time: Monday 2025-02-17 1630-1700 EET, in Brk3

 Deadline: Wednesday 2025-02-19 1000 EET (for tdoc availability—rapporteur is asked to provide the report earlier for company comments)

Email discussion summary

[R2-2500496](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202502%20-%20RAN2_129%2C%20Athens%5CExtracts%5CR2-2500496%20Report%20of%20%5BPOST128%5D%5B401%5DRelay%20Control_Plane.docx) Report of [Post128][401][Relay] Control Plane Baseline Solution InterDigital discussion Rel-19 NR\_SL\_relay\_multihop

* Noted

Easy Proposals (at most 1 company disagrees strongly)

[Existing FFS points and SUI format]

Proposal 1: RAN2 assumes that discovery and PC5 connection establishment can be performed in each intermediate UE prior to processing the received RRCSetupRequest by the remote UE. The related FFS can be removed from the stage 2 description.

Proposal 2: For the baseline solution, the last relay sending SUI on behalf of other relay UEs is not supported. The related FFS can be removed from the stage 2 description.

Proposal 3: For the baseline solution, Rel17 SUI message and format is re-used.

Proposal 4: No further clarification in stage 2 description is needed to clarify that a relay UE can establish its RLC channel for relaying of SRB1 during its own connection establishment and details will be clarified in stage 3. The related FFS can be removed from the stage 2 description.

Discussion:

ZTE are OK with P1 but wonder if there is spec impact. InterDigital understand that it is about whether we need a change to stage 2, and the conclusion is that we do not and we can remove the FFS.

Ericsson think there are concerns with P4 and we need to discuss if there is stage 2 impact. Samsung understand P4 relates to the RLC channel between relay UE and its parent node. Apple thought it was only about the last relay UE. OPPO think Ericsson’s concern is separate from P4 because the RLC channel in P4 is only for its own relaying of SRB1.

Agreements:

RAN2 assumes that discovery and PC5 connection establishment can be performed in each intermediate UE prior to processing the received RRCSetupRequest by the remote UE. The related FFS can be removed from the stage 2 description.

For the baseline solution, the last relay sending SUI on behalf of other relay UEs is not supported. The related FFS can be removed from the stage 2 description.

For the baseline solution, Rel17 SUI message and format is re-used.

No further clarification in stage 2 description is needed to clarify that a relay UE can establish its RLC channel for relaying of SRB1 from its immediate child node during its own connection establishment and details will be clarified in stage 3 (i.e., follow legacy U2N procedure from Rel-17 to set up the RLC channel for SRB1). The related FFS can be removed from the stage 2 description.

[SI acquisition and forwarding]

Proposal 5: For system information acquisition in multi-hop, the remote UE:

o When RRC\_CONNECTED, uses Uu RRC signaling to obtain its system information directly from its connected cell.

o When RRC\_IDLE/RRC\_INACTIVE, can request SI using PC5-RRC signaling (e.g., RemoteUEInformationSidelink message)

o When in RRC\_IDLE/RRC\_INACTIVE, receives the required SI from PC5-RRC signaling (e.g., UuMessageTransferSidelink)

Proposal 6: For system information acquisition by the remote UE in multi-hop, the same triggers as Rel17 are supported for sending the PC5-RRC message (e.g., RemoteUEInformationSidelink) namely:

o when there is a change in the required SI while in RRC\_IDLE/RRC\_INACTIVE, or when entering RRC\_IDLE/RRC\_INACTIVE

o when it entering RRC\_CONNECTED, a PC5-RRC message (e.g., RemoteUEInformationSidelink) is sent to cancel a previously sent required SI

Proposal 7: The last relay UE in multihop can forward SI (e.g., in a UuMessageTransferSidelink) to an intermediate Relay upon:

• acquisition of the SIB(s) requested (in a hop by hop manner) by a connected child node (intermediate node and/or remote UE)

• reception of updates of any SIBs requested by a remote UE or another a child relay UE (in a hop-by-hop manner), including SIB1

• deciding to perform unsolicited SIB1 forwarding

Proposal 8: An intermediate relay UE that is RRC\_CONNECTED uses Uu RRC signaling to obtain its system information directly from its connected cell (i.e., behaving as a remote UE).

Proposal 12: The intermediate UE, when it receives SI from a parent relay, forwards the SI message only to the child UEs which requested the SI (i.e., the intermediate UE keeps track of the required SI for each child node). FFS on the need for including a “remote UE ID” in the request.

Proposal 13: The PC5-RRC message containing the required SI that is transmitted by the remote UE or by the intermediate relay UE to the parent node contains at least the requested SIB list.

Proposal 14: Re-use RemoteUEInformationSidelink as the PC5-RRC message transmitted by the remote UE or by the intermediate relay UE to the parent node (intermediate relay or last relay) to request the required SI.

Proposal 15: The PC5-RRC message transmitted by the last relay UE or by the intermediate relay UE that provides the SI to a child UE contains at least containers with SIB1 and other system information requested by the child UE.

Proposal 16: Re-use UuMessageTransferSidelink as the PC5-RRC message transmitted by the Last relay or by the intermediate relay UE that provides SI to the child UE.

Discussion:

Huawei think P5 and P8 have a wording issue that suggests that the UE is receiving SI over Uu; maybe it should say “end-to-end”.

Qualcomm wonder if the intermediate relay should be allowed to respond to the SI request if it has the requested SI.

Agreements:

For system information acquisition in multi-hop, the remote UE:

o When RRC\_CONNECTED, uses end-to-end RRC signaling to obtain its system information directly from its connected cell.

o When RRC\_IDLE/RRC\_INACTIVE, can request SI using PC5-RRC signaling (e.g., RemoteUEInformationSidelink message)

o When in RRC\_IDLE/RRC\_INACTIVE, receives the required SI from PC5-RRC signaling (e.g., UuMessageTransferSidelink)

For system information acquisition by the remote UE in multi-hop, the same triggers as Rel17 are supported for sending the PC5-RRC message (e.g., RemoteUEInformationSidelink) namely:

o when there is a change in the required SI while in RRC\_IDLE/RRC\_INACTIVE, or when entering RRC\_IDLE/RRC\_INACTIVE

o when it entering RRC\_CONNECTED, a PC5-RRC message (e.g., RemoteUEInformationSidelink) is sent to cancel a previously sent required SI

The last relay UE in multihop can forward SI (e.g., in a UuMessageTransferSidelink) to an intermediate Relay upon:

• acquisition of the SIB(s) requested (in a hop by hop manner) by a connected child node (intermediate node and/or remote UE, but the last relay UE is not required to determine which node originated the request)

• reception of updates of any SIBs requested by a remote UE or another a child relay UE (in a hop-by-hop manner), including SIB1

• deciding to perform unsolicited SIB1 forwarding

An intermediate relay UE that is RRC\_CONNECTED may use end-to-end RRC signaling to obtain its system information directly from its connected cell (i.e., behaving as a remote UE).

The intermediate UE, when it receives SI from a parent relay, forwards the SI message only to the child UEs which requested the SI (i.e., the intermediate UE keeps track of the required SI for each child node). FFS on the need for including a “remote UE ID” in the request.

The PC5-RRC message containing the required SI that is transmitted by the remote UE or by the intermediate relay UE to the parent node contains at least the requested SIB list. FFS if the intermediate relay UE can respond directly instead of forwarding the request to the parent node if it has the requested SI.

Re-use RemoteUEInformationSidelink as the PC5-RRC message transmitted by the remote UE or by the intermediate relay UE to the parent node (intermediate relay or last relay) to request the required SI.

The PC5-RRC message transmitted by the last relay UE or by the intermediate relay UE that provides the SI to a child UE contains at least containers with SIB1 and other system information requested by the child UE.

Re-use UuMessageTransferSidelink as the PC5-RRC message transmitted by the Last relay or by the intermediate relay UE that provides SI to the child UE.

[Paging]

Proposal 18: The remote UE in multi-hop:

o When RRC\_IDLE/RRC\_INACTIVE, can request to receive paging by sending its paging information using PC5-RRC signaling (e.g., RemoteUEInformationSidelink message)

o When in RRC\_IDLE/RRC\_INACTIVE, can receive paging record from PC5-RRC signaling (e.g., UuMessageTransferSidelink)?

Proposal 19: For a remote UE in multi-hop, the same triggers as Rel17 are supported for sending the PC5-RRC message (e.g., RemoteUEInformationSidelink) namely:

o when there is a change in the paging information while in IDLE/INACTIVE, or when entering RRC\_IDLE/RRC\_INACTIVE

o when it entering RRC\_CONNECTED, a PC5-RRC message (e.g., RemoteUEInformationSidelink) is sent to release the paging information

Proposal 20: The last relay UE in multihop can forward paging to an intermediate Relay upon receiving paging message related to a multihop remote UE, or intermediate relay UE.

Discussion:

Qualcomm wonder about the role of the intermediate relay UE in P20; they understand that it would be functioning as a remote UE.

Agreements:

The remote UE in multi-hop:

o When RRC\_IDLE/RRC\_INACTIVE, can request to receive paging by sending its paging information using PC5-RRC signaling (e.g., RemoteUEInformationSidelink message)

o When in RRC\_IDLE/RRC\_INACTIVE, can receive paging record from PC5-RRC signaling (e.g., UuMessageTransferSidelink)?

For a remote UE in multi-hop, the same triggers as Rel17 are supported for sending the PC5-RRC message (e.g., RemoteUEInformationSidelink) namely:

o when there is a change in the paging information while in IDLE/INACTIVE, or when entering RRC\_IDLE/RRC\_INACTIVE

o when it entering RRC\_CONNECTED, a PC5-RRC message (e.g., RemoteUEInformationSidelink) is sent to release the paging information

The last relay UE in multihop can forward paging to an intermediate Relay upon receiving paging message related to a multihop remote UE (including the case of an intermediate relay UE functioning as a remote UE).

Proposal 25: When the intermediate UE receives a paging message from a parent relay on PC5, it forwards the paging message only to the remote UE/intermediate UE being paged or the intermediate UE serving a UE being paged.

Proposal 26: The PC5-RRC message containing the paging information that is transmitted by the remote UE or by the intermediate relay UE to the parent node contains at least paging ID and paging cycle of the remote UE and any serving (parent) intermediate relay UEs.

Proposal 27: Re-use RemoteUEInformationSidelink as the PC5-RRC message transmitted by the remote UE or by the intermediate relay UE to the parent node (intermediate relay or last relay) to provide the paging information.

Proposal 28: The PC5-RRC message transmitted by the last relay UE or by the intermediate relay UE contains at least one or multiple paging record(s) associated with intermediate relay UE(s) and/or remote UE(s).

Proposal 29: Re-use UuMessageTransferSidelink as the PC5-RRC message transmitted by the Last relay or by the intermediate relay UE that provides paging record to the child UE(s).

Discussion:

CATT want to clarify that these are all about the per-hop signalling. InterDigital confirm.

Qualcomm think P25 suggests that the intermediate relay UE has to remember all the paging information for its child UEs. InterDigital clarify that the intention is to avoid having two remote UEs request from the same intermediate relay and each gets the response for the other as well as its own. Qualcomm agree with the intention but note that here the child node may be a relay UE.

ZTE understand that the intermediate relay UE does not need to identify who is the ultimate recipient of a paging message; it just forwards the paging message to its direct child based on the paging request, according to legacy behaviour. InterDigital also understand that it is legacy behaviour.

Samsung wonder why the intermediate UE is there in P25.

Agreements:

When the intermediate UE receives a paging message from a parent relay on PC5, it forwards the paging message only to the remote UE being paged or the intermediate relay UE serving a remote UE being paged.

The PC5-RRC message containing the paging information that is transmitted by the remote UE or by the intermediate relay UE to the parent node contains at least paging UE ID and paging cycle of the remote UE and any intermediate relay UEs serving the remote UE.

Re-use RemoteUEInformationSidelink as the PC5-RRC message transmitted by the remote UE or by the intermediate relay UE to the parent node (intermediate relay or last relay) to provide the paging information.

The PC5-RRC message transmitted by the last relay UE or by the intermediate relay UE contains at least one or multiple paging record(s) associated with intermediate relay UE(s) and/or remote UE(s).

Re-use UuMessageTransferSidelink as the PC5-RRC message transmitted by the Last relay or by the intermediate relay UE that provides paging record to the child UE(s).

Proposals requiring further discussion (more than one company having different views on some aspects)

[System information]

Proposal 9: When an intermediate relay UE is in RRC\_IDLE/RRC\_INACTIVE it can obtain the SI required by it or requested by the remote UE by requesting SI from the parent relay UE in PC5-RRC (e.g., using RemoteUEInformationSidelink). FFS if it can also receive it directly from SIB broadcast by the cell on Uu (when the the intermediate relay UE is in coverage).

Proposal 10: The intermediate relay UE sends SI request in PC5-RRC (e.g., in RemoteUEInformationSidelink) to the parent relay (intermediate relay or last relay):

• when there is a change in the SI required by the intermediate UE

• when the intermediate UE enters RRC\_IDLE/RRC\_INACTIVE

• when the intermediate UE enters RRC\_CONNECTED (to cancel a previously sent SI request)

• upon reception of new/changed required SI received from a remote UE/child relay UE

• FFS when there is a change in the ability of the intermediate UE to receive SIB broadcast on Uu (e.g., moving in/out of coverage) to initiate/cancel SI forwarding by the parent relay.

Proposal 11: The intermediate relay UE can send SI (e.g., in UuMessageTransferSidelink) to a child node:

a) Upon reception of SI received from a parent node (intermediate relay or last relay) containing SI requested by a child node (intermediate relay or remote UE)

b) Upon acquisition (from the network) of SI requested by a child node (intermediate relay or remote UE)

c) Upon receiving updated SIBs from the network which have been requested by a child node (intermediate relay or remote UE)

d) Upon reception of SIB1 received from a parent relay (i.e., this case may correspond to SIB1 update detected by the last relay, or unsolicited SIB1 forwarding by the last relay)

e) Upon receiving updated SIB1 from the network (as in Rel17)

f) Upon unsolicited SIB1 forwarding to a connected child node (intermediate relay UE or remote UE)

FFS if b), c), and e) are limited to RRC\_CONNECTED relay UE or apply in all states. FFS whether to consolidate some of the conditions in stage 3 specification text.

Discussion:

In P9, NEC would like to exclude the FFS because it creates the possibility of receiving mismatched SI from different sources. vivo understand that we permit this in Rel-17. OPPO think the situation is different since we were considering cell selection/reselection independent of the relay operation, and in Rel-17 there is no requirement for the remote UE to check consistency between the SIBs, while here the SIB may be required by the remote UE and should be consistent with the other SIBs.

OPPO understand even for approach 1, we cannot assume the intermediate relay UE is physically located in the same cell as its parent(s); it may be treating the serving relay’s cell as its own serving cell but capable of receiving on Uu from a different cell.

Apple think at least the same-cell case should be supported. Lenovo understand the intermediate relay UE can know which cell serves the last relay UE.

OPPO think there would be specification impact for the intermediate relay UE to check that it is the same cell, and it cannot be left to UE implementation. InterDigital agree but think there would be more impact to restrict the UE from reading SI in coverage.

OPPO think we might distinguish between the intermediate UE receiving for itself or for forwarding, and they would like to keep it FFS. NEC agree and think we should focus on the baseline solution.

Agreements:

When an intermediate relay UE is in RRC\_IDLE/RRC\_INACTIVE it can obtain the SI required by it or requested by the remote UE by requesting SI from the parent relay UE in PC5-RRC (e.g., using RemoteUEInformationSidelink). FFS if it can also receive it directly from SIB broadcast by the last relay UE’s serving cell on Uu (when the intermediate relay UE is in coverage of the same cell that serves the last relay UE).

The intermediate relay UE sends SI request in PC5-RRC (e.g., in RemoteUEInformationSidelink) to the parent relay (intermediate relay or last relay), following legacy remote UE behaviour:

• when there is a change in the SI required by the intermediate UE for its own use (as a remote UE)

• when the intermediate UE enters RRC\_IDLE/RRC\_INACTIVE

• when the intermediate UE enters RRC\_CONNECTED (to cancel a previously sent SI request; if a child node requested the SI, the intermediate UE acquires it by dedicated signalling)

The intermediate relay UE sends SI request in PC5-RRC (e.g., in RemoteUEInformationSidelink) to the parent relay (intermediate relay or last relay):

• upon reception of new/changed required SI received from a remote UE/child relay UE (where the concerned SI was not previously requested)

• FFS when there is a change in the ability of the intermediate UE to receive SIB broadcast on Uu (e.g., moving in/out of coverage) to initiate/cancel SI forwarding by the parent relay.

The intermediate relay UE can send SI (e.g., in UuMessageTransferSidelink) to a child node:

a) Upon reception of SI received from intermediate relay or last relay containing SI requested by a child node (intermediate relay or remote UE)

b) Upon acquisition (from the network) of SI requested by a child node (intermediate relay or remote UE)

c) Upon receiving updated SIBs from the network which have been requested by a child node (intermediate relay or remote UE)

d) Upon reception of SIB1 received from a parent relay (i.e., this case may correspond to SIB1 update detected by the last relay, or unsolicited SIB1 forwarding by the last relay)

e) Upon receiving updated SIB1 from the network (as in Rel17)

f) Upon unsolicited SIB1 forwarding to a connected child node (intermediate relay UE or remote UE)

FFS if b), c), and e) are limited to RRC\_CONNECTED relay UE or apply in all states. FFS whether to consolidate some of the conditions in stage 3 specification text.

[Cross-cell case for remote UE]

Proposal 17: RAN2 discusses/confirms that if multiple remote UEs connected to a single intermediate relay UE, the multiple remote UEs must connect to the same cell.

Agreement:

If multiple remote UEs are connected to a single intermediate relay UE, the multiple remote UEs must connect through the same upstream path (same parent relay UE(s)).

[Paging]

Proposal 21: An intermediate relay UE in RRC\_CONNECTED releases its paging-related information in the parent UE at least for itself. FFS whether it also releases it for the child UEs and how the child UEs receive the paging when the intermediate relay UE is in RRC\_CONNECTED.

Proposal 22: When an intermediate relay UE is in RRC\_IDLE/RRC\_INACTIVE it can obtain paging from the parent relay UE in PC5-RRC (e.g., using RemoteUEInformationSidelink). FFS if it can also receive it directly on Uu (when the the intermediate relay UE is in coverage).

Proposal 23: What triggers the intermediate relay UE to request paging monitoring by the parent relay (intermediate relay or last relay) in PC5-RRC (e.g., in RemoteUEInformationSidelink)?

• when there is a change in the paging information of the intermediate UE or child UE

• when the intermediate UE enters RRC\_IDLE/RRC\_INACTIVE

• when the intermediate UE enters RRC\_CONNECTED (to cancel paging monitoring request)

• upon reception of paging monitoring request from a remote UE/child relay UE?

• FFS upon change in the ability of the intermediate UE to monitor paging on Uu (e.g., moving in/out of coverage) to initiate/cancel paging monitoring by the parent relay).

Proposal 24: The intermediate relay UE sends paging message (e.g., in UuMessageTransferSidelink) to a child node

• Upon reception of paging message received from a parent node (intermediate relay or last relay) that is intended for a child node (intermediate relay or remote UE)

• FFS upon acquisition (from the network) of paging message that is for a child node (intermediate relay or remote UE)

Discussion:

Samsung think these are legacy behaviour. OPPO think the FFS points about direct monitoring are different.

Qualcomm think P23 assumes if the relay is in idle/inactive, the last relay UE will always be the one to monitor paging. They are OK with this assumption but think we do not then need the first bullet, because only the last relay UE needs to check if there is a change. Lenovo think the first bullet might also cover paging monitoring release.

Agreements:

An intermediate relay UE in RRC\_CONNECTED releases its paging-related information in the parent UE at least for itself. FFS whether it also releases it for the child UEs and how the child UEs receive the paging when the intermediate relay UE is in RRC\_CONNECTED.

When an intermediate relay UE is in RRC\_IDLE/RRC\_INACTIVE it can obtain paging from the parent relay UE in PC5-RRC (e.g., using RemoteUEInformationSidelink). FFS if it can also receive it directly on Uu (when the intermediate relay UE is in coverage).

What triggers the intermediate relay UE to request paging monitoring by the parent relay (intermediate relay or last relay) in PC5-RRC (e.g., in RemoteUEInformationSidelink)?

• FFS: when there is a change in the paging information of the intermediate UE or child UE

• when the intermediate UE enters RRC\_IDLE/RRC\_INACTIVE

• when the intermediate UE enters RRC\_CONNECTED (to cancel paging monitoring request)

• upon reception of paging monitoring request from a remote UE/child relay UE

• FFS: upon change in the ability of the intermediate UE to monitor paging on Uu (e.g., moving in/out of coverage) to initiate/cancel paging monitoring by the parent relay).

The intermediate relay UE sends paging message (e.g., in UuMessageTransferSidelink) to a child node

• Upon reception of paging message received from a parent node (intermediate relay or last relay) that is intended for a child node (intermediate relay or remote UE)

• FFS upon acquisition (from the network) of paging message that is for a child node (intermediate relay or remote UE)

P1-P3 (baseline/Approach 2)

[R2-2500864](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202502%20-%20RAN2_129%2C%20Athens%5CExtracts%5CR2-2500864%20-%20discussion%20on%20control%20plane%20procedure.docx) Discussion on control plane procedures Ericsson, Apple, AT&T, InterDigital Inc, FirstNet, Qualcomm Incorporated discussion Rel-19 NR\_SL\_relay\_multihop

Proposal 1 RAN2 to further work on the approach that allows a RRC\_IDLE/RRC\_INACTIVE intermediate UE in the path, aiming for limited additional design complexity and specification efforts for RAN2.

Proposal 2 RAN2 to work on mechanisms to allow an intermediate relay UE to stay in RRC\_INACTIVE when the remote UE triggers RRC connection establishment.

Proposal 3 RAN2 to send an LS to SA2 and SA3 to query whether there is any authorization concern to support an intermediate relay UE to stay in RRC\_IDLE when the remote UE triggers RRC connection establishment.

P1 (message forwarding before transition to connected)

[R2-2500934](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202502%20-%20RAN2_129%2C%20Athens%5CExtracts%5CR2-2500934_relay_CP.docx) Control Plane under multihop L2 U2N relaying Kyocera discussion

Proposal 1 The intermediate relay UE should be allowed to forward the remote UE’s RRC Setup Request in case while it is still in RRC IDLE/INACTIVE.

P5b-P5c, P7 (details of setup procedure, local ID allocation)

[R2-2500701](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202502%20-%20RAN2_129%2C%20Athens%5CExtracts%5CR2-2500701%20Control%20plane%20procedures%20for%20multi-hop%20relay.docx) Control plane procedures for multi-hop relay Huawei, HiSilicon discussion Rel-19 NR\_SL\_relay\_multihop-Core

Proposal 5b. The Last Relay UE cannot send the SUI on behalf of all other relay UEs. Each relay UE shall report the SUI and indicate the L2 ID of its adjacent child UE to the gNB.

Proposal 5c. RAN2 can discuss the necessity to enable the parallel RLC channel establishment for relaying of SRB1 at each relay UE.

Proposal 7: Reusing the single-hop relay mechanism to support the Local ID allocation for multi-hop relay:

• Parent relay UE of the remote UE reports the L2 ID to the gNB to request the local ID allocation, the uniqueness of the local ID can be guaranteed by the gNB by implementation.

• The remote UE local ID is 8 bits.

P1-P2, P11-P12 (protocol stacks, RLC channel configuration)

[R2-2500898](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202502%20-%20RAN2_129%2C%20Athens%5CExtracts%5CR2-2500898%20Discussion%20on%20control%20plane%20procedures%20for%20multi-hop%20SL%20Relay.doc) Discussion on control plane procedures for multi-hop SL Relay ZTE Corporation, Sanechips discussion Rel-19 NR\_SL\_relay\_multihop

Proposal 1. Adopt the following CP and UP protocol stacks for multi-hop L2 U2N relay.

Proposal 2. Capture following protocol stack for discovery:

Proposal 11. In multi-hop L2 U2N relay, SL-RLC0/1 defined in R17 can be reused for multi-hop remote UE’s SRB0/1 forwarding over the first PC5 hop. PC5 RLC channels for remote UE’s SRB2/DRBs forwarding over the first PC5 hop are configured by gNB via dedicated signalling.

Proposal 12. For each intermediate PC5 hops, the PC5 RLC channels used to forward remote UE’s SRBs/DRBs are configured by gNB via dedicated signalling.

P11-P15 (RLF handling)

[R2-2500188](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202502%20-%20RAN2_129%2C%20Athens%5CExtracts%5CR2-2500188_Discussion%20on%20the%20Control%20Plane%20Procedures.docx) Discussion on the Control Plane Procedures CATT discussion Rel-19 NR\_SL\_relay\_multihop-Core

Proposal 11: In approach 1, when Remote UE detects PC5 RLF, its behaviors are same as Rel-17 U2N Remote UE.

Proposal 12: In approach 1, when the first Relay UE detects PC5 RLF between the Remote UE and the first Relay UE, its behaviors are same as Rel-17 U2N Relay .

Proposal 13: In approach 1, when the first Relay UE detects PC5 RLF between the first Relay UE and Intermediate Relay/last Relay UE, it can send NotificationMessageSidelink to the Remote UE to indicate the failure between first Relay UE and Intermediate Relay/last Relay UE.

Proposal 14: In approach 1, when the last Relay UE detects PC5 RLF, its behaviors are same as Rel-17 U2N Relay UE.

Proposal 15: In approach 1, when the last Relay UE detects Uu RLF, it can send NotificationMessageSidelink to its child Relay UE, and its child Relay UE can forward it to the Remote UE.

P16-P17 (further details on notification message)

[R2-2501184](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202502%20-%20RAN2_129%2C%20Athens%5CExtracts%5CR2-2501184-MH-Cplane.docx) discussion on C-plane procedure for multi-hop relay Sharp discussion Rel-19 NR\_SL\_relay\_multihop-Core

Proposal 16. NotificationMessageSidelink should be sent hop-by-hop if needed.

Proposal 17. RAN2 discusses whether the remote UE including intermediate UEs should perform RRC re-establishment (, unicast link release or cell re-selection) upon reception of NotificationMessageSidelink.

SRAP aspects (offline summary)

[R2-2501421](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202502%20-%20RAN2_129%2C%20Athens%5CInbox%5CR2-2501421.zip) [AT129][401][Relay] SRAP for Rel-19 multihop relay (OPPO) OPPO discussion Rel-19 NR\_SL\_relay\_multihop-Core

* Noted

Proposal 1. In multi-hop L2 U2N relay, besides the agreed remote UE ID and BEARER ID, in addition, at least include D/C field in the SRAP PDU header.

Proposal 2. In multi-hop L2 U2N relay, for SRAP header, at least support the legacy single-hop U2N SRAP header, i.e., the agreed UE ID field is used for the remote UE local ID. FFS on whether to have one additional format to include remote UE L2 ID and what use case it is applied for.

Discussion:

Ericsson are not sure if we need a control PDU.

ZTE think we could have a D/C field to enable reusing the legacy header, even if there is no CPDU. OPPO confirm this is the intention, and whether we need CPDU was not discussed.

OPPO clarify that on P2, the FFS is because companies are considering cases like parallel RRC setup and think including the remote UE’s L2ID may be needed.

Lenovo understand the intention of P2 is to include the content of the legacy header and potentially more.

Qualcomm think the local ID field in P2 could also be used for an intermediate relay UE.

Agreements:

In multi-hop L2 U2N relay, besides the agreed remote UE ID and BEARER ID, in addition, at least include D/C field in the SRAP PDU header.

In multi-hop L2 U2N relay, for SRAP header, at least support the legacy single-hop U2N SRAP header, i.e., the agreed UE ID field is used for the remote UE local ID (including the case of an intermediate relay UE acting as a remote UE). FFS on whether to have one additional format to include remote UE L2 ID and what use case it is applied for.

P1-P3 (SRAP entities, RLC channel configurations, direction bit)

[R2-2500434](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202502%20-%20RAN2_129%2C%20Athens%5CExtracts%5CR2-2500434%20Discussion%20on%20SRAP.docx) Discussion on SRAP for Multi-hop Layer-2 U2N Relay Apple discussion Rel-19 NR\_SL\_relay\_multihop

* Noted

Proposal 1 Each Layer-2 Intermediate Relay UE has a single PC5 SRAP entity.

Proposal 2 For SRAP mapping in intermediate relay, a single set of PC5 Relay RLC channel configurations is used for both directions, whereas different SRAP mapping could be used in each direction.

Discussion:

OPPO understand for P2, in legacy operation there are two sets of RLC channel configurations at the relay UE, which suggests that in multihop we could have separate configurations as well.

ZTE think we may have different QoS in UL and DL leading to different configurations. Huawei agree.

Samsung understand the single set of configurations to mean that we reuse the same IE for both DL and UL, but they think for UL we may not need to include an ID of the parent, while in DL we would need the ID of the child.

Apple clarify that they intend that the SRAP mapping could be different for UL and DL, but it seems wasteful for the network to provide two independent configurations for the directions. Whether the channel is used depends on the mapping.

Samsung think the RLC channel configuration includes what the related nodes are, and there will be different configurations in the two directions because there is only one parent node but there can be multiple child nodes. They think we may be able to reuse the same IE without including the “next hop” node ID in the uplink direction.

OPPO understood that legacy has two RLC channel configurations, but the discussion here is a bit confusing in that respect.

Agreement:

Each Layer-2 Intermediate Relay UE has a single PC5 SRAP entity.

Other contributions

[R2-2500194](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202502%20-%20RAN2_129%2C%20Athens%5CExtracts%5CR2-2500194%20-%20Control%20plane%20procedures%20of%20multi-hop%20U2N%20relay.docx) Control plane procedures of multi-hop U2N relay OPPO discussion Rel-19 NR\_SL\_relay\_multihop-Core

[R2-2500300](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202502%20-%20RAN2_129%2C%20Athens%5CExtracts%5CR2-2500300%20Control%20Plane%20aspects%20for%20Multi-hop%20Relay.docx) Control Plane aspects for Multi-hop Relay NEC discussion Rel-19 NR\_SL\_relay\_multihop

[R2-2500308](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202502%20-%20RAN2_129%2C%20Athens%5CExtracts%5CR2-2500308_CP_v0.docx) Consideration on CP issues for multi-hop SL relay Samsung discussion Rel-19 NR\_SL\_relay\_multihop-Core

[R2-2500433](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202502%20-%20RAN2_129%2C%20Athens%5CExtracts%5CR2-2500433%20Discussion%20on%20CP%20v1.docx) Discussion on Control Plane for Multi-hop UE-to-NW Relay Apple discussion Rel-19 NR\_SL\_relay\_multihop

[R2-2500498](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202502%20-%20RAN2_129%2C%20Athens%5CExtracts%5CR2-2500498%20%28R19%20SL%20Relay%20WI_AI8.13.3%20CP%29.doc) Control Plane Handling for Multi-hop U2N Relays InterDigital discussion Rel-19 NR\_SL\_relay\_multihop

[R2-2500509](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202502%20-%20RAN2_129%2C%20Athens%5CExtracts%5CR2-2500509-Discussion%20on%20the%20control%20plane%20procedure%20for%20multi-hop%20U2N%20relay.docx) Discussion on the control plane procedure for multi-hop U2N relay LG Electronics Inc. discussion

[R2-2500561](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202502%20-%20RAN2_129%2C%20Athens%5CExtracts%5CR2-2500561%20Discussion%20on%20control%20plane%20aspects%20for%20NR%20sidelink%20multi-hop%20relay.docx) Discussion on control plane aspects for NR sidelink multi-hop relay China Telecom discussion Rel-19 NR\_SL\_relay\_multihop-Core

[R2-2500633](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202502%20-%20RAN2_129%2C%20Athens%5CExtracts%5CR2-2500633%20Control%20plane%20in%20Multi-hop%20relay%20v2.doc) Control plane in Multi-hop relay Lenovo discussion Rel-19

[R2-2500913](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202502%20-%20RAN2_129%2C%20Athens%5CExtracts%5CR2-2500913%20SRAP%20design%20for%20R19%20multi-hop%20SL%20relaying.docx) SRAP design for R19 multi-hop SL relaying Samsung R&D Institute UK discussion

[R2-2500953](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202502%20-%20RAN2_129%2C%20Athens%5CExtracts%5CR2-2500953.doc) Discussion on control plane procedure for SL multi-hop relay KT Corp. discussion

[R2-2501119](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202502%20-%20RAN2_129%2C%20Athens%5CExtracts%5CR2-2501119_Discussion%20on%20CP%20and%20SRAP%20impact%20for%20baseline%20procedure.docx) Discussion on CP and SRAP impact for baseline procedure vivo discussion Rel-19

[R2-2501260](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202502%20-%20RAN2_129%2C%20Athens%5CExtracts%5CR2-2501260-Open%20issue%20for%20control%20plane%20.docx) Open issue for control plane approach 1 Qualcomm Incorporated discussion NR\_SL\_relay\_multihop-Core

Withdrawn/Not available

R2-2500725 SRAP impacts on MH relay Nokia discussion NR\_SL\_relay\_multihop R2-2410290 Withdrawn

### 8.13.4 Service continuity

First priority scenarios: (A) intra-gNB multi-hop indirect to direct path switch, (B) intra-gNB multi-hpo indirect to single-hop indirect path switch. Second priority scenarios: (C) intra-gNB direct to multi-hop indirect path switch, (D) intra-gNB single-hop indirect to multi-hop indirect path switch.

Cases A/B (m2x, higher priority):

P1-P2, P5-P6 (measurement report contents)

[R2-2501120](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202502%20-%20RAN2_129%2C%20Athens%5CExtracts%5CR2-2501120_Discussion%20on%20Service%20continuity%20for%20multi-hop%20relay.docx) Discussion on Service continuity for multi-hop relay vivo discussion Rel-19

* Noted

Proposal 1: For multi-hop i2d, Remote UE evaluates both relay link (for the link between remote UE and serving first relay UE) and Uu link, where the sidelink relay measurement report shall include at least serving first relay UE's source L2 ID, serving cell ID and sidelink measurement quantity result.

Proposal 2: For multi-hop i2d, first relay UE/ Intermediate relay UE evaluates adjacent relay link, where the sidelink relay measurement report shall include at least measured relay UE's source L2 ID, serving cell ID and sidelink measurement quantity result.

Proposal 5: For multi-hop i2i, the remote UE reports serving first relay UE and candidate single-hop relay UE(s), including at least a source L2 ID, serving cell ID, and a sidelink measurement quantity information.

Proposal 6: For multi-hop i2i, first/ intermediate relay UE evaluates adjacent relay links, where the sidelink relay measurement report shall include at least serving intermediate/ last relay UE's source L2 ID, serving cell ID and sidelink measurement quantity result.

Discussion:

CATT think we could directly agree P1/P5, but they would prefer to leave P2/P6 and not have the intermediate relay UEs monitoring link quality; we can leave it to RLF.

OPPO agree with all the proposals, and they understand P2/P6 are similar to legacy functionality.

Qualcomm wonder how the report to the network will be sent in P2, and they are not sure how the proposal would interact with relay reselection. Chair understood the signalling would be regular e2e Uu signalling. Qualcomm clarify they are wondering how the network will know which relay UE it applies to.

Huawei are OK with the proposals.

OPPO understand that how to perform the handover is the network’s decision, and the proposals are about the report contents.

CATT think the key point is who triggers the handover; they understand that it will only be triggered for the remote UE. ZTE think this is more about network behaviour than what is specified.

Kyocera wonder if we include the case where the intermediate UE is also a remote UE, so it can be handed over separate from its child(ren).

Ericsson understand the network can already configure the intermediate UEs with measurement events.

Qualcomm wonder about the case that intermediate UEs perform handover/reselection and whether the neighbouring UEs should be notified. Ericsson understand that this is the case under network control.

Qualcomm understand that if the intermediate relay UE experiences a path switch, it is a kind of group handover case. Ericsson understand that the intermediate can trigger the path switch, and the gNB will do something subject to implementation.

OPPO understand when the measurement report comes from the intermediate UE, the network may first switch the remote UE to another path, but there may be cases where it cannot do that and the intermediate UE would have to send a notification message to its child(ren), as in legacy operation. Huawei have a similar understanding and think we do not need to support simultaneous path switching at different levels.

Lenovo think in P2, only the upstream link should be evaluated. OPPO have the same understanding.

Ericsson think that the reports by the intermediate UE might not give the network the opportunity to act on them, and maybe these two should be FFS.

Samsung think we could still have reporting, and how the network acts is up to implementation. They think this would be a divergence from legacy behaviour.

Chair understands the intention is to allow the network to determine if the serving path is bad. CATT think this could be left to be resolved by RLF.

Samsung think this is only reporting, and the intermediate node cannot differentiate what the purpose is.

Agreements:

For multi-hop i2d, Remote UE evaluates both relay link (for the link between remote UE and serving first relay UE) and Uu link, where the sidelink relay measurement report shall include at least serving first relay UE's source L2 ID, serving cell ID and sidelink measurement quantity result.

For multi-hop i2d, first relay UE evaluates adjacent upstream relay link and Uu link, where the sidelink relay measurement report shall include at least measured relay UE's source L2 ID, serving cell ID and sidelink measurement quantity result. FFS if intermediate relay UE reports.

For multi-hop i2i, the remote UE reports serving first relay UE and candidate single-hop relay UE(s), including at least a source L2 ID, serving cell ID, and a sidelink measurement quantity information.

For multi-hop i2i, first evaluates adjacent upstream relay link and candidate relay link, where the sidelink relay measurement report shall include at least serving intermediate/ last relay UE's source L2 ID, serving cell ID and sidelink measurement quantity result. FFS if intermediate relay UE reports.

P1-P2 (reuse of reconfigurationWithSync)

[R2-2500733](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202502%20-%20RAN2_129%2C%20Athens%5CExtracts%5CR2-2500733_Considerations%20on%20Service%20Continuity%20of%20Multi-hop%20Relay.docx) Considerations on Service Continuity of Multi-hop Relay NEC discussion

Proposal 1: Using reconfigurationWithSync without sl-PathSwitchConfig for path switching of Scenario A and an added step to release the first relay UE of the source indirect path.

Proposal 2: Using reconfigurationWithSync including sl-PathSwitchConfig for path switching of Scenario B and an added step to release the first relay UE of the source indirect path.

P2 (reconfiguration of relays)

[R2-2500927](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202502%20-%20RAN2_129%2C%20Athens%5CExtracts%5CR2-2500927.docx) Intra-gNB Service Continuity for Multi-Hop Relays Ericsson discussion Rel-19

Proposal 2 For both mh2d and mh2i, it is up to network implementation when the first/last/intermediate relay UEs are reconfigured after the path switch command is sent to the remote UE.

Cases C/D (x2m, lower priority):

P2, P4 (events for cases C and D)

[R2-2500562](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202502%20-%20RAN2_129%2C%20Athens%5CExtracts%5CR2-2500562%20Discussion%20on%20service%20continuity%20for%20multi-hop%20relay.docx) Discussion on service continuity for multi-hop relay China Telecom discussion Rel-19 NR\_SL\_relay\_multihop-Core

Proposal 2: Event Y1/ Y2 could be used for intra-gNB direct to multi-hop indirect path switching. The PC5 quality between the remote UE and candidate U2N relay/candidate first relay is considered for evaluating Event Y1/ Y2.

Proposal 4: Event Z1/ Y2 could be used for intra-gNB multi-hop indirect to direct path switching. The remote UE shall consider the first relay as serving L2 U2N relay for evaluating Event Z1.

P2, P6 (no special handling for relays already in path)

[R2-2500193](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202502%20-%20RAN2_129%2C%20Athens%5CExtracts%5CR2-2500193%20-%20Service%20continuity%20of%20multi-hop%20U2N%20relay.docx) Service continuity of multi-hop U2N relay OPPO discussion Rel-19 NR\_SL\_relay\_multihop-Core

Proposal 2 RAN2 to confirm for scenario B, no spec impact is needed for the remote UE to identify whether the U2N Relay at the target side is the intermediate or last relay at the source side.

Proposal 6 RAN2 to confirm for scenario D, no specific handling is needed for the case that the either intermediated relay or last relay at the target side is the U2N relay UE at the source side compared with the normal case.

P3 (procedure for C), P6-P7 (message contents for C), P10-P12 (procedure and message contents for D)

[R2-2500189](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202502%20-%20RAN2_129%2C%20Athens%5CExtracts%5CR2-2500189%20Intra-gNB%20Service%20Continuity%20for%20Multi-hop%20U2N%20Relay.docx) Intra-gNB Service Continuity for Multi-hop U2N Relay CATT discussion Rel-19 NR\_SL\_relay\_multihop-Core

Proposal 3: Suggest RAN2 to adopt Figure-2 as the baseline signaling flow for intra-gNB direct to multi-hop indirect path switching.

Proposal 6: The UE will perform the legacy measurement event Y1/Y2 except the description on candidate L2 U2N Relay UE in event Y1/Y2 should be revised to include the candidate First Relay UE.

Proposal 7: For Scenario C, the network will send RRC reconfiguration message to the target Last/Intermediate/First Relay UE, which includes at least the Ingress/Egress RLC channel and mapping configuration for L2 U2N Remote UE.

Proposal 10: Suggest RAN2 to adopt Figure-3 as the baseline signaling flow for intra-gNB single-hop indirect to multi-hop indirect path switching.

Proposal 11: The UE will perform the legacy measurement event X2/Y2/Z1 except the description on candidate L2 U2N Relay UE in event Y2/Z1 should be revised to include the candidate First Relay UE.

Proposal 12: For Scenario D, the network will send RRC reconfiguration message to the target Last/Intermediate/First Relay UE, which includes at least the Ingress/Egress RLC channel and mapping configuration for L2 U2N Remote UE.

P2 (state of target relay UE), P3 (T420 reuse)

[R2-2500634](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202502%20-%20RAN2_129%2C%20Athens%5CExtracts%5CR2-2500634%20Service%20continuity%20in%20Multi-hop%20relay%20v2.doc) Service continuity for Multi-hop system Lenovo discussion Rel-19

Proposal 2: RAN2 confirm that the target relay UE as first intermediate relay UE should be RRC connected state for the path switch towards multi-hop indirect path.

Proposal 3: Timer T420 can be reused for path switching towards multi-hop indirect path.

[R2-2500421](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202502%20-%20RAN2_129%2C%20Athens%5CExtracts%5CR2-2500421%20RRC%20states%20of%20candidate%20Relay%20UEs%20for%20path%20switching.docx) RRC states of candidate Relay UEs for path switching ASUSTeK discussion Rel-19 NR\_SL\_relay\_multihop

[R2-2500510](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202502%20-%20RAN2_129%2C%20Athens%5CExtracts%5CR2-2500510-Discussion%20on%20service%20continuity%20for%20multi-hop%20U2N%20relay.docx) Discussion on service continuity for multi-hop U2N relay LG Electronics Inc. discussion

[R2-2500702](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202502%20-%20RAN2_129%2C%20Athens%5CExtracts%5CR2-2500702%20Discussion%20on%20service%20continuity%20for%20Multi-hop%20Relay.docx) Discussion on service continuity for Multi-hop Relay Huawei, HiSilicon discussion Rel-19 NR\_SL\_relay\_multihop-Core

[R2-2500906](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202502%20-%20RAN2_129%2C%20Athens%5CExtracts%5CR2-2500906%20Discussion%20on%20service%20continuity%20for%20multi-hop%20relay.doc) Discussion on service continuity for multi-hop SL relay ZTE Corporation, Sanechips discussion Rel-19 NR\_SL\_relay\_multihop-Core

[R2-2500935](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202502%20-%20RAN2_129%2C%20Athens%5CExtracts%5CR2-2500935_relay_service_continuity.docx) Service Continuity for U2N multihop relay Kyocera discussion

[R2-2501185](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202502%20-%20RAN2_129%2C%20Athens%5CExtracts%5CR2-2501185-MH-ServiceContinuity.docx) discussion on service continuity for multi-hop relay Sharp discussion Rel-19 NR\_SL\_relay\_multihop-Core

## 8.15 NavIC L1 SPS A-GNSS support

(LCS\_NAVIC\_L1\_SPS\_NR\_LTE-Core; leading WG: RAN2; REL-19; WID RP-243247)

Time budget: 0.5 TU

Tdoc Limitation: 1 tdoc

Including outcome of email discussion [Post128][403][POS] NavIC L1 stage 3 CR check (Reliance Jio)

Email discussion report

[R2-2500361](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202502%20-%20RAN2_129%2C%20Athens%5CExtracts%5CR2-2500361.docx) [Post128][403][POS] NavIC L1 stage 3 CR check (Reliance Jio) Reliance Jio discussion Rel-19 LCS\_NAVIC\_L1\_SPS\_NR\_LTE-Core Late

* Noted

Discussion:

Ericsson present the paper, clarifying that R2-2500972 still needs to be treated.

Proposals from R2-2500972:

Proposal 1 RAN2 to agree to below Text Proposal for updating Note2 of IE GNSS-SSR-OrbitCorrections.

Proposal 2 GNSS ID of NavIC is replaced from navic-v1610 to navic.

Discussion:

Qualcomm wonder if we should keep the extension for consistency. Ericsson think it does not need to be duplicated in the bitmap entry.

Qualcomm understand P1 is NBC. They understand that it only affects SSR-OrbitAndClockCorrections, and we can provide a separate table entry for L1 and use the extensible versions of the SSR IEs that we introduced for BDS B1C.

Rapporteur CR

[R2-2500108](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202502%20-%20RAN2_129%2C%20Athens%5CExtracts%5CR2-2500108-NavIC_L1_stage3_CR.docx) Introduction of NavIC L1 SPS A-GNSS in LPP Reliance Jio, ISRO, Ericsson, MediaTek, CEWiT CR Rel-19 37.355 18.4.0 0532 1 B LCS\_NAVIC\_L1\_SPS\_NR\_LTE-Core R2-2409726 Late

Discussion:

Qualcomm understand that there is a change in the satellite health field that introduces a whole row for L5 instead of just one entry. CATT think this may be correct because of two orbit models. Qualcomm understand that it should be possible to signal both L1 and L5 health in the same message, so they think one of the reserved bits should become L5 health. Huawei have the same understanding.

Ericsson think the understanding is that only one health can be provided. Huawei indicate that both are in the ICD.

Huawei indicate that the discussion of the iod table under BDS should be applicable here too: The scale factor should be removed.

Agreements:

L1 and L5 to share a row in the SV health table.

Iod table to be updated to remove the scale factor.

* [POST129][401][POS] NavIC L1 CR update (Ericsson)

 Scope: Update the CR in R2-2500108 in line with decisions of this meeting, and check it for final correctness.

 Intended outcome: Agreeable CR

 Deadline: Very long (to RAN2#130)

Other contributions

[R2-2500811](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202502%20-%20RAN2_129%2C%20Athens%5CExtracts%5CR2-2500811%20Discussion%20on%20the%20remaining%20issues%20of%20NavIC%20L1%20SPS.docx) Discussion on the support of NavIC L1 SPS Huawei, HiSilicon discussion Rel-19 LCS\_NAVIC\_L1\_SPS\_NR\_LTE-Core

* Noted

Proposal: For the support of L1 SPS for NAVIC in LPP, adopt the following changes:

 Introduce a new IE for the ephemeris of L1 SPS

 Add IGP to the generic assistance data

 Introduce new IE for NeQuick model

 Introduce new IE for Klobuchar like Ionosphere Coefficients by adding new fields to KlobucharModelParameter

 Introduce support for NAVIC time offset with respect to UTC (NPLI), UTC and other GNSS (GPS, Galileo, and GLONASS)

[R2-2500972](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202502%20-%20RAN2_129%2C%20Athens%5CExtracts%5CR2-2500972%20NavIC.docx) NavIC broadcast ephemeris to refer to for GNSS SSR corrections Ericsson, Reliance Jio discussion

* Noted

Proposal 1 RAN2 to agree to below Text Proposal for updating Note2 of IE GNSS-SSR-OrbitCorrections.

Proposal 2 GNSS ID of NavIC is replaced from navic-v1610 to navic.

## 8.16 BDS B2b in A-GNSS

LCS\_BDS\_B2b\_LTE\_NR; leading WG: RAN2; REL-19; WID RP-242459)

Time budget: 0.25 TU

Tdoc Limitation: 1 tdoc

Including outcome of email discussion [Post128][402][POS] BDS B2b stage 3 CR check (CATT)

Email discussion report

[R2-2500278](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202502%20-%20RAN2_129%2C%20Athens%5CExtracts%5CR2-2500278%20%5BPost128%5D%5B402%5D%5BPOS%5D%20BDS%20B2b%20stage%203%20CR%20check%20%28CATT%29.docx) [Post128][402][POS] BDS B2b stage 3 CR check (CATT) CATT discussion Rel-19 LCS\_BDS\_B2b\_LTE\_NR

* Noted

Proposal 1: On the description of IE bdsTgdB1Cp and bdsIscB1Cd in BDS-ClockModel2, RAN2 to agree to not to add any clarification on these two IEs based on the existing protocol.

Proposal 2: On the description of IE bdsIODE in NavModel-BDS-KeplerianSet2, RAN2 to agree to not to add any clarification based on the existing protocol.

Proposal 3: RAN2 to agree to combine B2b with B1I/B3I in the table of GNSS to iod Bit String(11) relation in IE GNSS-NavigationModel as below:

BDS B1I/B3I/B2b 11 MSB bits of toe (seconds, scale factor 512, range 0 – 604672) [23], [50],

11 MSB bits of toe [XX]

[Chair’s note: See R2-2500278 for proposal with properly formatted table]

Discussion:

Huawei think if a new field is introduced, the legacy fields in P1 (which are mandatory) should be ignored by the UE. CATT indicate there is no corresponding parameter in the ICD, but the algorithm still uses parameters from other signals, so they understand that the legacy parameters can still be applicable.

Qualcomm have the same understanding as CATT: The “old” values are still valid, e.g., for dual-frequency measurements. On P3, they think it would be better to remove the scale factor completely and just say “11 MSBs of the toe”.

CATT can accept removing the scale factor and range in P3, or alternatively just add the references: “11 MSBs of toe [23][50][XX]”.

On P2, Huawei understand that there is no IODE in the ICD. Qualcomm indicate that it is needed for differential corrections.

Agreements:

On the description of IE bdsTgdB1Cp and bdsIscB1Cd in BDS-ClockModel2, do not add any clarification on these two IEs based on the existing protocol.

On the description of IE bdsIODE in NavModel-BDS-KeplerianSet2, do not add any clarification based on the existing protocol.

Combine B2b with B1I/B3I in the table of GNSS to iod Bit String(11) relation in IE GNSS-NavigationModel as below:

BDS B1I/B3I/B2b 11 MSB bits of toe [23], [50], [XX]

Rapporteur CR

[R2-2500279](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202502%20-%20RAN2_129%2C%20Athens%5CExtracts%5CR2-2500279%20Introduction%20of%20B2b%20signal%20in%20BDS%20system%20in%20A-GNSS_37355_CR0545_%28Rel-19%29.docx) Introduction of B2b signal in BDS system in A-GNSS CATT, CAICT, Ericsson, Huawei, HiSilicon CR Rel-19 37.355 18.4.0 0545 - B LCS\_BDS\_B2b\_LTE\_NR

* Iod table to be modified as described above (“BDS B1I/B3I/B2b 11 MSBs of toe [23], [50]. [XX]”)
* Agreed in principle with this change as R2-2501435

Discussion:

CATT clarify that the only update needed is for the modification of the iod table.

Other contributions

[R2-2500810](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202502%20-%20RAN2_129%2C%20Athens%5CExtracts%5CR2-2500810%20Discussion%20on%20the%20remaining%20issues%20for%20BDS%20B2b.docx) Discussion on the remaining issues for BDS B2b Huawei, HiSilicon discussion Rel-19 LCS\_BDS\_B2b\_LTE\_NR

Proposal1: Remove the scale factor and unit for the field IOD for BDS B2b signal and apply the same change for the legacy fields description for B3I .

Proposal2: Add BDS B2b to the row for BDS B1I/B3I for the mapping between GNSS to iod bit string.

[R2-2500973](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202502%20-%20RAN2_129%2C%20Athens%5CExtracts%5CR2-2500973%20BDS.docx) Remaining issues of BDS B2b Signal Addition Ericsson discussion

Proposal 1 The ignoring of legacy fields is clarified as suggested in the text proposal.

## 8.18 TEI19

Time budget: 1 TU

Tdoc Limitation: 1 tdoc for new proposals and 1 tdoc for old proposals.

1 additional tdoc for primary co-sourcing company on top of the limit is allowed for co-sourced contribution with 4 or more companies.

Companies are encouraged to submit co-sourced contributions, which will have priority for discussion in RAN2#129.

Positioning: on-demand posSIB

[R2-2500820](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202502%20-%20RAN2_129%2C%20Athens%5CExtracts%5CR2-2500820%20Discussion%20on%20the%20control%20parameters%20for%20on-demand%20posSIB%20request%20%5BPosOdSIB-Req%5D.docx) Discussion on the control parameters for on-demand posSIB request [PosOdSIB-Req] Huawei, HiSilicon, CATT, Ericsson, Qualcomm discussion Rel-19 TEI19

* Noted

Proposal1: Introduce control parameters, including delivery amount and delivery interval for posSIBs with periodic delivery requirements for SI request in RRC\_CONNECTED.

Proposal2: Adopt the TP in Annex A for RRC spec and the TP in Annex B for UE capability spec.

Discussion:

Qualcomm think it may be easier simply to exclude the periodic SIBs from dedicated delivery; otherwise the gNB may see different periodicities from different UEs although it gets only a fixed periodicity from the LMF.

Huawei note that it is only a request from the UE, and the gNB does not have to comply with it. Qualcomm think “start” and “stop” would be enough for this. Huawei think the amount is still valid.

Nokia think the amount would be a number of repetitions of the broadcast, rather than a number of updates. Huawei think the periodicity could be based on what the gNB receives from the LMF, and the content is transparent to the gNB anyway.

Samsung think the UE cannot know the periodicity and should just request the overall time duration.

Huawei think the amount would be fine, and we may not need anything over the current signalling in the TP.

Qualcomm note that the gNB can turn on broadcast, so the periodicity can come from the scheduling information.

Lenovo wonder if the UE knows that it can send the request. Huawei indicate there is a configuration for it in the TP, which, however, could be simplified to ENUMERATED { enabled } OPTIONAL Need R.

Nokia think the corrections for RTK are expected to happen continuously, and if you restrict to a finite number of repetitions it means you only want them for a certain period. Huawei confirm that it works this way, and the signalling allows the UE to request start/stop/number of repetitions/indefinite repetitions.

Agreements:

Introduce control parameters, including delivery amount and start/stop, for posSIBs with periodic delivery requirements for SI request in RRC\_CONNECTED.

Control signalling in reconfiguration to be encoded as ENUMERATED { enabled } OPTIONAL Need R.

Positioning: coordinate reference systems

[R2-2500970](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202502%20-%20RAN2_129%2C%20Athens%5CExtracts%5CR2-2500970-CRS-Dis.docx) Introduction of Location Coordinate Reference Systems Ericsson, AT&T, FirstNet, Deutsche Telekom, MediaTek Inc. discussion

* Revised in R2-2501329

[R2-2501329](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202502%20-%20RAN2_129%2C%20Athens%5CExtracts%5CR2-2501329%20CRS-Dis.docx) Introduction of Location Coordinate Reference Systems Ericsson, AT&T, FirstNet, Deutsche Telekom, MediaTek Inc., ESA discussion

* Noted

Proposal 1 Introduce support for regional CRS and CRS transformations in 3GPP RAN2.

Proposal 2 Agree to text proposals in Appendix A, B and C.

Discussion:

CATT wonder if this feature also applies to RAT-independent methods other than A-GNSS; they understand that if we follow RTCM it might be only GNSS-related.

Qualcomm are sceptical of some of the observations; they see that the proposal would require doing extensive coordinate system transformations, whereas today we do everything in terms of WGS84. They agree that local applications may require local coordinates, but they think this can be handled in the application layer.

Qualcomm are concerned that a parallel change would be needed in RAN3; otherwise different gNB vendors could use different coordinate systems. If something is needed, they think it needs to be a WI and will affect many different interfaces throughout the system.

Huawei agree with Qualcomm that the feature needs to be handled end-to-end. They are also unsure what requirement motivated RTCM to define it and if the same requirement applies to 3GPP. For instance, our customers in general are not cartographers.

Ericsson indicate that the use case is that operators are using regional systems, and translating from regional to WGS84 to regional is needless work.

Qualcomm think this is exactly the argument for using WGS84: It avoids having to refer into a fragmented database of coordinate systems, and the network side does not necessarily know what coordinate system the UE is expecting.

Nokia agree that this is the reason for using WGS84 on standardised interfaces, but if it makes the operator’s life easier to use a local coordinate system, it is not clear who should ultimately do the conversion.

MediaTek understand there are assistance data providers using regional coordinate systems. Qualcomm are not aware of a service provider that cannot do a conversion.

Ericsson want to avoid doing a conversion when all parties are using the same CRS.

Qualcomm think anything like this should be done in 23.032 first and propagated through the 3GPP ecosystem.

## 8.19 NR Others

Tdoc limit: 1

Contributions addressing LS from RAN4 R4-2420410 and any RAN4 LSs not related to any of the AIs above.

[R2-2500047](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202502%20-%20RAN2_129%2C%20Athens%5CDocs%5CR2-2500047.zip) LS on Location service of UEs served by MWAB (S2-2412625; contact: Huawei) SA2 LS in Rel-19 VMR\_Ph2 To:RAN3 Cc:RAN2

* Noted

Discussion:

Nokia assume RAN3 would eventually have a CR to 38.305. Huawei know there is a topology discussion in RAN3 but are not sure where this fits in.