3GPP TSG-RAN WG2 Meeting #122 R2-230xxxx
Incheon, South Korea, May 22 – 26 2023

Agenda Item: 8.5

Source: Session Chair (Samsung)

Title: Report from session on NR SL

Document for: Approval

Time Schedule
Please refer to the latest schedule in the RAN2 inbox on the public 3GPP servers.

## List and Status of Offline/Email Discussions

## Approved outgoing LSs

## 4.3 V2X and Sidelink corrections Rel-15 and earlier

REL-15 and Earlier WIs related to V2x and Sidelink are in scope but not listed explicitly (long list).

This Agenda Item is treated in the V2X and Sidelink Breakout session

### 4.3.0 In-Principle-Agreed CRs

### 4.3.1 Corrections

## 5.2 NR V2X

(5G\_V2X\_NRSL-Core; leading WG: RAN1; REL-16; started: Mar 19; target; Aug 20; WID: RP-200129).

CR rapporteurs will take care of miscellaneous CRs to collect small changes. Please contact / coordinate with CR rapporteur company first for small changes (e.g. non-controversial clarification/correction, editorial correction, etc.).

### 5.2.0 In-principle agreed CRs

R2-2304854 Corrections including field description for transmission power Huawei, HiSilicon (Rapporteur), ZTE Corporation, Sanechips, CATT CR Rel-16 38.331 16.12.0 4067 1 F 5G\_V2X\_NRSL-Core R2-2304217

R2-2304855 Corrections including field description for transmission power Huawei, HiSilicon (Rapporteur), ZTE Corporation, Sanechips, CATT CR Rel-17 38.331 17.4.0 4068 1 A 5G\_V2X\_NRSL-Core R2-2304218

R2-2306369 Correction for Measurement Event Triggering Criteria Sharp Corporation CR Rel-16 38.331 16.12.0 4049 1 F 5G\_V2X\_NRSL-Core R2-2304078

* CRs in R2-2304854, R2-2304855 and R2-2306369 are agreed.

R2-2306110 Corrections on MAC reset regarding configured sidelink grant ASUSTeK, Huawei, HiSilicon, Samsung, vivo CR Rel-16 38.321 16.11.0 1605 2 F 5G\_V2X\_NRSL-Core R2-2304237 Withdrawn

### 5.2.1 Corrections

R2-2304829 Discussion on future extensibility of sl-FreqInfoList in R16/17 NR SL Spec vivo discussion Rel-16

R2-2304850 Potential issue caused by using destination index Huawei, HiSilicon, vivo discussion Rel-16 5G\_V2X\_NRSL-Core

R2-2304851 Correction on destination index for SL measurement configuration Huawei, HiSilicon CR Rel-16 38.331 16.12.0 4077 - F 5G\_V2X\_NRSL-Core

R2-2304852 Correction on destination index for SL measurement configuration Huawei, HiSilicon CR Rel-17 38.331 17.4.0 4078 - A 5G\_V2X\_NRSL-Core

R2-2304853 Correction on destination index for SL DRX configuration Huawei, HiSilicon CR Rel-17 38.331 17.4.0 4079 - F NR\_SL\_enh-Core

[Ericsson]: It seems R2-2304829 proposed a change due to Rel-18 SL CA support. Not sure whether we need discussion as part of Rel-16. [Vivo]: Do not propose any real change, but want to check companies’ views. [Xiaomi]: Agree with Ericsson. [Session chair]: If companies are reluctant to change Rel-16 now, it is expected we’ll not change Rel-16 spec. Instead we probably introduce new IE for multiple carriers in Rel-18. Anyway, it will be good to check companies view via offline.

* [AT122][501][V2X/SL] V2X corrections (Vivo)

 **Scope:** Discuss R2-2304829, R2-2304850, R2-2304851, R2-2304852, and R2-2304853 (including the need of correction). Prepare agreeable CRs (if needed).

 **Intended outcome:** Discussion summary in R2-2306701 and 38.331 CRs in R2-2306702/R2-2306703

**Deadline:** To be handled in comeback session in 5/25

R2-2304941 Correction on TS 38.304 for NR SL vivo CR Rel-16 38.304 16.9.0 0340 - F 5G\_V2X\_NRSL-Core

R2-2304942 Correction on TS 38.304 for NR SL vivo CR Rel-17 38.304 17.4.0 0341 - A 5G\_V2X\_NRSL-Core

* Agreed.

R2-2304991 Summary on user plane corrections for NR V2X LG Electronics Inc. discussion 5G\_V2X\_NRSL-Core withdrawn

## 6.7 NR Sidelink enhancements

(NR\_SL\_enh-Core; leading WG: RAN1; REL-17; WID: RP-202846)

Tdoc Limitation: 3 tdocs

Note for RRC and MAC CRs, CR rapporteur’s summary and suggestion may be provided. CR rapporteurs will take care of miscellaneous CRs to collect small changes. Please contact / coordinate with CR rapporteur company first for small changes (e.g. non-controversial clarification/correction, editorial correction, etc.).

### 6.7.0 In-principle agreed CRs

R2-2304760 Correction on the usage of default CBR values for NR sidelink OPPO, Xiaomi, CATT CR Rel-17 38.321 17.4.0 1611 1 F NR\_SL\_enh-Core R2-2304229

R2-2304843 Miscellaneous corrections on 38.331 for SL enhancements Huawei, HiSilicon (Rapporteur), Xiaomi CR Rel-17 38.331 17.4.0 4069 1 F NR\_SL\_enh-Core R2-2304235

R2-2306177 Corrections on MAC reset regarding configured sidelink grant ASUSTeK, Huawei, HiSilicon, Samsung, vivo CR Rel-17 38.321 17.4.0 1605 3 F NR\_SL\_enh-Core R2-2304237

* CRs in R2-2304760, R2-2304843, and R2-2306177 are agreed.

### 6.7.1 General and Stage 2 corrections

R2-2305225 Miscellaneous corrections on TS 38.300 for NR sidelink Xiaomi CR Rel-17 38.300 17.4.0 0673 - F NR\_SL\_enh-Core

R2-2304844 Corrections on TS 38.300 for SL enhancements Huawei, HiSilicon CR Rel-17 38.300 17.4.0 0669 - F NR\_SL\_enh-Core

R2-2305111 Correction to 38300 on IUC Ericsson, Apple CR Rel-17 38.300 17.4.0 0649 1 F NR\_SL\_enh-Core R2-2302839

R2-2305112 Correction to 38300 on IUC cast type Ericsson CR Rel-17 38.300 17.4.0 0650 1 F NR\_SL\_enh-Core R2-2302840

* [AT122][502][V2X/SL] 38.300 corrections (Xiaomi)

 **Scope:** Discuss R2-2305225, R2-2304844, R2-2305111, R2-2305112, and R2-2305057 (including the need of correction). Prepare agreeable merged CR (if needed).

 **Intended outcome:** Discussion summary in R2-2306704 and 38.300 CR in R2-2306705

**Deadline:** Email approval at 5/25 18:00 (KST)

R2-2305058 Miscellaneous corrections for Stage 2 NR sidelink relay Apple CR Rel-17 38.300 17.4.0 0656 1 F NR\_SL\_relay-Core R2-2303384

* Moved to SL relay AI

### 6.7.2 Control plane corrections

R2-2306118 Discussion on deriving timer length for DRX timers ASUSTeK, vivo, ZTE Corporation, Sanechips discussion Rel-17 38.331 NR\_SL\_enh-Core

Proposal 1: For sidelink configured grant Type 2, the reference PDCCH, to derive the symbol length of drx-HARQ-RTT-TimerSL and slot length of drx-RetransmissionTimerSL, is the PDCCH activating the sidelink configured grant Type 2.

* Agreed.

Proposal 2: Spec change is needed for SL UE to derive symbol length for drx-HARQ-RTT-TimerSL and the slot length for drx-RetransmissionTimerSL corresponding to SL configured grant Type 1.

* Agreed.

 Proposal 3: RAN2 to selects from one of the following Options for derivation of timer length for drx-HARQ-RTT-TimerSL and drx-RetransmissionTimerSL for sidelink configured grant Type 1:

 - Option 1: referring to active DL BWP.

 - Option 1a: referring to active DL BWP of the PCell.

 - Option 1b: referring to active DL BWP where DCI format 3\_0 was monitored.

 - Option 2: referring to the DL BWP on which the PDCCH transmission indicating the PDSCH carrying the RRCReconfiguration containing rrc-ConfiguredSidelinkGrant for the corresponding SL grant was transmitted.

 - Option 3: referring to the SL BWP where the transport block is transmitted.

- Option 4: leave it to UE implementation.

[Session chair]: Check companies’ supports. Any option (except option4) can work as long as NW and UE have same understanding on the reference BWP.

* Option 1: 0
* Option 1a: 5
* Option 1b: 1
* Option 2: 3
* Option 3: 3
* Option 1a is agreed.
* [AT122][503][V2X/SL] 38.331 correction on deriving DRX timer length (ASUSTek)

 **Scope:** Prepare 38.331 CR according to online agreement.

 **Intended outcome:** 38.331 CR in R2-2306706

**Deadline:** Email approval at 5/25 18:00 (KST)

R2-2306119 Corrections on deriving timer length for DRX timers (option 1a) ASUSTeK, ZTE Corporation, Sanechips CR Rel-17 38.331 17.4.0 4136 - F NR\_SL\_enh-Core

R2-2306257 Corrections on deriving timer length for DRX timers by relying on DCI format 3\_0 (option 1b) vivo CR Rel-17 38.331 17.4.0 4143 - F NR\_SL\_enh-Core

R2-2305276 Consideration on the time length for DRX timers CATT discussion Rel-17 NR\_SL\_enh-Core

R2-2305277 Correction on the time length for DRX timers CATT CR Rel-17 38.331 17.4.0 4098 - F NR\_SL\_enh-Core

R2-2304846 Corrections on TS 38.304 for SL enhancements Huawei, HiSilicon CR Rel-17 38.304 17.4.0 0338 - F NR\_SL\_enh-Core

R2-2304940 Corrections on TS 38.304 for NR SL enhancement vivo CR Rel-17 38.304 17.4.0 0339 - F NR\_SL\_enh-Core, NR\_SL\_relay-Core

* [AT122][504][V2X/SL] 38.304 correction (Huawei)

 **Scope:** Discuss R2-2304846 and R2-23049 (including the need of correction). Prepare agreeable CR (if needed).

 **Intended outcome:** Discussion summary in R2-2306707 and 38.304 CR in R2-2306708

**Deadline:** Email approval at 5/25 18:00 (KST)

R2-2305059 Correction on field description of sl-DestinationIdentityL2U2N Apple CR Rel-17 38.331 17.4.0 4086 - F NR\_SL\_relay-Core

R2-2305060 Corrections on triggering conditons of SUI message for SL relay Apple CR Rel-17 38.331 17.4.0 4087 - F NR\_SL\_relay-Core

* R2-2305059 and R2-2305060 are moved to SL relay AI

### 6.7.3 User plane corrections

R2-2306311 MAC PDU filtering Nokia, Nokia Shanghai Bell CR Rel-17 38.321 17.4.0 1627 - F NR\_SL\_enh-Core

Move MAC PDU filtering behaviour in a NOTE to normative text.

[LG, Xiaomi]: Ok with moving it to normative text.

* Agree to move MAC PDU filtering behaviour in a NOTE to normative text. Detailed wordings will be handled as part of [505] email discussion. If same change is required for SL relay, we can also include the corresponding change.

R2-2304995 Summary on user plane corrections for NR SL enhancements LG Electronics Inc. discussion NR\_SL\_enh-Core Late

R2-2304845 Correction on 38.321 for SL enhancements Huawei, HiSilicon CR Rel-17 38.321 17.4.0 1615 - F NR\_SL\_enh-Core

R2-2305226 Miscellaneous corrections on TS 38.321 for NR sidelink Xiaomi CR Rel-17 38.321 17.4.0 1618 - F NR\_SL\_enh-Core

R2-2305278 Correction on resource (re-)selection for NR sidelink CATT CR Rel-17 38.321 17.4.0 1619 - F NR\_SL\_enh-Core

R2-2305224 Discussion on the usage of default CBR values for exceptional pool Xiaomi discussion

* [AT122][505][V2X/SL] 38.321 corrections (LG)

 **Scope:** Discuss R2-2304845, R2-2305226, R2-2305278 and R2-2305224 (including the need of correction). Prepare agreeable merged CR (if needed).

 **Intended outcome:** Discussion summary in R2-2306709 and 38.321 CR in R2-2306710

**Deadline:** Email approval at 5/25 18:00 (KST)

R2-2305589 Corrections on SRAP for SL relay NEC, Apple, Samsung, ZTE CR Rel-17 38.351 17.4.0 0020 2 F NR\_SL\_relay-Core R2-2304480

* Moved to SL relay AI

## 7.15 NR Sidelink evolution

(NR\_SL\_enh2; leading WG: RAN1; REL-18; WID: RP-230077)

Time budget: 1 TU

Tdoc Limitation: 6 tdocs

### 7.15.1 Organizational

Includes Incoming LS, rapporteur inputs, and stage-2 running CR.

R2-2304618 LS on MCSt resource (re-)selection (R1-2304257; contact: OPPO) RAN1 LS in Rel-18 NR\_SL\_enh2-Core To:RAN2

* Noted.

R2-2304665 Work plan of R18 SL-Evo OPPO, LG Work Plan Rel-18 NR\_SL\_enh2

* Noted.

R2-2305179 Stage 2 Running CR of TS 38.300 for SL Evolution InterDigital discussion Rel-18 NR\_SL\_enh2

* [AT122][506][V2X/SL] 38.300 running CR (IDC)

 **Scope:** Discuss R2-2305179.

 **Intended outcome:** 38.300 running CR in R2-2306711 to be endorsed.

**Deadline:** Email approval at 5/25 18:00 (KST)

### 7.15.2 SL-U: SL Consistent LBT failure, SL LCP

Continue the discussion from RAN2#121bis-e, e.g. including further updates/details on SL C-LBT failure handling/recovery, details of SL LCP restriction, etc.

**SL C-LBT failure recovery (mode 2, RRC ide/inactive UE):**

* Option1: Rely on resource pool (re)selection (P1:5554)
* Option2: Exclusion of RB set(s) that SL C-LBT failure was detected in (candidate) resource selection + resource pool (re)selection

[Apple, Xiaomi, LG, Vivo, Intel, ZTE, NEC]: Option 2 is preferred. With option 1, it is not efficient in radio resource usage.

* Option 2 is agreed.
	+ With option2, when the UE switches to resource pool (re)selection?
		- Option1: When SL C-LBT failure was detected for all RB-sets within a selected resource pool? (P3:4805)
		- Option2: When SL C-LBT failure was detected for RB-sets > threshold within a resource pool? (P8:4831)
		- Option3: When the size of S\_A < threshold? (P10a:5089)
		- Option4: Up to UE implementation? (P1:4666)

[ZTE]: Option1 is baseline and other options are more for optimization. [Xiaomi]: How to configure threshold, e.g. for option3? If it is up to UE implementation, it will be same as option4. [Apple]: Intention is to configure threshold by NW. [Lenovo]: It’s not easy to configure threshold common to all UEs since the required resource would be different based on its traffic characteristics. [IDC]: Agree with Lenovo. Prefer option1. [Vivo]: Prefer having specified UE behaviour. Option1 is acceptable. [Apple]: Option1 is acceptable. [Intel]: Agree with Lenovo and option1 is ok. [Nokia, Ericsson, Qualcomm]: With option1, e.g. remaining one RB-set may not be enough for data transmission dependent on amount of data and traffic characteristics. Prefer option4. [Huawei]: Seems the concerned case by Nokia would be a corner case. [Lenovo]: It may be also associated with whether we have a cancellation condition based on timer. [OPPO]: We can consider both option1 and option4. If option1 happens, there is no other choice than performing resource pool (re)selection. If option1 doesn’t happen, the UE is still allowed to perform resource pool (re)selection if the UE determines the resource is not enough.

* Option 1 is baseline. Option 4 is allowed even when option1 doesn’t happen.
	+ With option2, whether L1 or MAC performs the resource exclusion?
		- In candidate resource selection by L1? (P2:4805)
		- In resource (re)selection triggering + resource (re)selection by MAC? (P2:4666)

[Ericsson]: If L1 performs resource exclusion, it will be simple in MAC, i.e. just to provide the C-LBT failure information to L1. [Vivo]: MAC is more appropriate position to know which RB set has a problem. [IDC, Apple]: It will be simpler if MAC performs resource exclusion. [Session chair]: Rel-16 SL basic design principle was that the resource exclusion was done as part of candidate resource selection in L1 and MAC selects any of them (randomly) as part of resource (re)selection. [Nokia, LG]: Agree with session chair. [NEC]: Prefer MAC performs resource exclusion otherwise why not L1 performs C-LBT failure detection? [Lenovo]: MAC maintains timers and if C-LBT failure is detected, MAC just indicates RB set information to L1. [Vivo]: Agree with Lenovo and session chair. [Qualcomm]: If MAC does that, the amount of candidate resource may be less than the target percentage compared to Rel-16. [Qualcomm, Ericsson]: Agree with Lenovo and session chair. [IDC]: L1 performing resource exclusion is acceptable. [OPPO]: Worried if RAN1 may not have enough time to consider it in the remaining meetings.

* MAC informs the RB set information where SL C-LBT failure was detected.
* L1 performs the resource exclusion for the RB set that SL C-LBT failure was detected.
* RAN2 will send a LS to RAN1 to ask to take it into consideration in their job.

* [AT122][508][V2X/SL] LS to RAN1 (IDC)

 **Scope:** Discuss LS to RAN1 on SL C-LBT failure recovery.

 **Intended outcome:** LS to RAN1 in R2-2306713.

**Deadline:** Email approval at end of 5/24 (KST)

* The UE (re)selects which resource pool?
	+ Option1: A resource pool that has any RB-set that SL C-LBT failure was not detected? (P2:5554)
	+ Option2: A resource pool where number of RB-set(s) that SL C-LBT failure was not detected > threshold? (P10:4831)
	+ Option3: Up to UE implementation

[Session chair]: skip the discussion

**SL C-LBT failure recovery (mode 1)**

* Leave it to gNB implementation after UE reporting SL C-LBT failure indication. No spec change. (P4:4831)
* Agreed.

**SL C-LBT failure recovery (mode 2, RRC connected UE)**

* Follow mode 1 solution?
* Follow mode 2 solution?

[Session chair]: skip the discussion

**SL C-LBT failure and S-SSB? (P14:4831)**

* SL C-LBT failure takes SL LBT failure of S-SSB into account
* SL C-LBT failure does NOT take SL LBT failure of S-SSB into account
* Send LS to RAN1 to let them make decision?

Q1: Whether to count LBT failure for S-SSB transmission or not in determination of C-LBT failure?

[Lenovo]: Prefer counting it. There is no difference in the channel access point of view. [OPPO]: Prefer not counting it. RB set for S-SSB transmission and RB set for data transmission can be different. In the case, how to handle S-SSB should be left to RAN1. [Lenovo]: Granularity of LBT failure indication is per RB set, so it doesn’t matter whether RB set is same or different for data and S-SSB. [Ericsson]: In NR-U, we count all LBT failure indication (no distinction which channel). Agree with Lenovo that in the channel access point of view, it doesn’t matter which channel. [Vivo]: There is no RAN1 agreement that RB set for S-SSB cannot be used for data transmission. [NEC, OPPO]: How to handle if RB set for S-SSB transmission and RB set for the selected resource pool are different? [Session chair]: Let’s focus more basic scenario, e.g. RB set for S-SSB transmission belongs to the selected resource pool. [LG]: Agree with session chair. [Session chair]: We may consider the concerned case by NEC/OPPO later.

* Counting LBT failure indication regardless of whether LBT failure was provided because of S-SSB transmission or data transmission when RB set for S-SSB transmission belongs to the selected TX resource pool.

Q2: If C-LBT failure was detected, whether to stop S-SSB transmission or not?

[OPPO, IDC]: S-SSB transmissions in multiple RB-sets are under RAN1 discussion. Prefer to leave this discussion and decision to RAN1.

**SL C-LBT failure and PSFCH? (P15:4831)**

* SL C-LBT failure takes SL LBT failure of PSFCH into account
* SL C-LBT failure does NOT take SL LBT failure of PSFCH into account

Q1: Whether to count LBT failure for PSFCH transmission or not in determination of C-LBT failure?

[LG]: Counting PSFCH is preferred. [OPPO/NEC]: Prefer to have same restriction as the agreement for S-SSB (adding when RB set for PSFCH transmission belongs to the selected TX resource pool).

* Counting LBT failure indication regardless of whether LBT failure was provided because of PSFCH transmission or not when RB set for PSFCH transmission belongs to the selected TX resource pool. FFS when multiple PSFCH occasions are configured.

Q2: If C-LBT failure was detected, whether to stop PSFCH transmission or not?

[LG, Intel, Vivo]: Prefer to have common conclusion as S-SSB transmission. It would be good to leave this discussion and decision to RAN1.

**SL C-LBT cancellation**

* Mode 1
	+ Upon SL C-LBT failure MAC CE transmission (P5:4666)
* Agreed.

* Mode 2 (RRC idle/inactive UE)
	+ Upon resource pool (re)selection (P11:5089)
	+ SL consistent LBT failure recovery parameters are reconfigured (P18:4831)
	+ PC5 MAC reset (P18:4831)
	+ Reconfiguration of resource pool(s) that include SL RB set(s) with triggered but not cancelled SL consistent LBT failure (P18:4831)
	+ Transition between RRC\_CONNECTED mode and RRC\_IDLE/INACTIVE mode (P18:4831)
	+ RA mode change (P7a:5227)
	+ Reconfiguration of RB sets (P3:4934)
	+ Based on timer (P17:4831)
	+ Based on measured channel condition (P17:4831)

For the condition “Upon resource pool (re)selection”:

[OPPO]: For resource pool (re)selection case, at least one LBT failure success should be received. [Ericsson, IDC, Lenovo]; Don’t support this condition. If we have a condition based on timer/channel condition, this condition is redundant. [Huawei]: RAN1 already allowed a case a RB set belongs to multiple resource pool, then this option does not work well.

[Session chair]: Let’s first try on cancellation based on timer or measured channel condition. [IDC]: Both timer based cancellation and measured channel condition based cancellation are required. [Session chair]: Not sure if we need multiple solutions for a given issue. If we need to select one of two, which should be more baseline? [Xiaomi]: Then prefer measured channel condition based cancellation. [OPPO]: Once the UE takes an action for recovery, it should be cancelled. We first should discuss what is an action for recovery. Then we discuss what additional criterion would be needed on top of recovery actions. [Vivo]: We can consider both kinds of cancellation (i.e. recovery action based cancellation and new cancellation based on timer/measured channel condition). [ZTE]: It is for idle/inactive UE. The UE needs to determine when to cancel it by itself. [IDC, Lenovo]: In Uu case, we rely on informing the gNB then how to recover is up to gNB implementation. However for SL, it is different. UE should be able to determine by itself. [Session chair]: Let’s check initial companies’ preference on each option.

- Option1: Timer based cancellation (LG, ZTE, Vivo, Huawei, Lenovo, Nokia: 6)

- Option2: Measured channel condition based cancellation (FFS on what to be measured) (Ericsson, Xiaomi, Qualcomm, IDC: 4)

- Option3: Rely on recovery action and no need for both option1 and option2 (OPPO, Spreadtrum, NEC, CATT, Apple, Intel: 6)

[Apple]: Option3 is based on what we have in Uu case. For new mechanism as option1 and 2, we need more clear majority companies’ supports.

* Revisit it next meeting.
* Mode 2 (RRC connected UE)
	+ Follow mode 1 solution?
	+ Follow mode 2 solution?

[Session chair]: Skip the discussion

**Enhanced LCP**

* When enhanced LCP should be used? (P13:4666/P2:4788)
	+ Data in the buffer meets shared COT requirements
		- Transmission to COT initiating UE
	+ Selected resource is within a shared COT
	+ Type 2 LBT is used

[Session chair]: Remaining question is for shared COT, if CAPC restriction is applicable to enhanced LCP according to RAN1 agreement on CAPC requirement. What are companies’ views?

- Yes: Apple, LG, ZTE, NEC, Xiaomi, Huawei, Qualcomm, IDC, Nokia, Intel, OPPO, Lenovo, ASUSTek, Samsung (14)

- No: Ericsson, Vivo (2)

* Working assumption: For shared COT, CAPC restriction is applicable to enhanced LCP according RAN1 agreement on CAPC requirement.
* Do we really need to specify for all other cases when legacy LCP (with type 1 LBT) is used?
* Skip the discussion

R2-2304666 Discussion on C-LBT and LCP Enhancement OPPO discussion Rel-18 NR\_SL\_enh2

R2-2304764 Discussion on shared COT and LCP vivo discussion Rel-17

R2-2304788 Discussion on SL consistent LBT failure and LCP impact LG Electronics Inc. discussion NR\_SL\_enh2

R2-2304805 Discussion on SL consistent LBT failure and LCP enhancement Huawei, HiSilicon discussion Rel-18 NR\_SL\_enh2

R2-2304831 Remaining issues on SL consistent LBT failure vivo discussion Rel-18

R2-2304934 Discussion on left issues for SL-U LBT SHARP Corporation discussion NR\_SL\_enh2

R2-2304975 Discussion on Sidelink consistent LBT failure and LCP ZTE Corporation, Sanechips discussion Rel-18 NR\_SL\_enh2

R2-2305027 Remaining issues on consistent LBT failure Ericsson discussion Rel-18 NR\_SL\_enh2

R2-2305089 Discussion on SL LCP and consistent LBT failure recovery Apple discussion Rel-18 NR\_SL\_enh2

R2-2305173 LBT Failure for SL Unlicensed InterDigital discussion Rel-18 NR\_SL\_enh2

R2-2305174 Implementing LCP for SL Unlicensed InterDigital discussion Rel-18 NR\_SL\_enh2

R2-2305227 Discussion on SL consistent LBT failure Xiaomi discussion

R2-2305228 Discussion on LCP restriction from COT sharing Xiaomi discussion

R2-2305283 Further Discussion on SL LBT and LCP CATT discussion Rel-18 NR\_SL\_enh2

R2-2305357 Further dicsussion on SL consistent LBT failure NEC discussion Rel-18 NR\_SL\_enh2

R2-2305554 Discussion on aspects related to consistent LBT failure and COT sharing Spreadtrum Communications discussion Rel-18

R2-2305734 Remaining details of SL LCP and SL consistent LBT procedure Lenovo discussion Rel-18 NR\_SL\_enh2-Core

R2-2305924 On recovery of Consistent LBT failure Nokia, Nokia Shanghai Bell discussion NR\_SL\_enh2

R2-2305931 R2-23xxxxx On the applicability of enhanced LCP Nokia, Nokia Shanghai Bell discussion NR\_SL\_enh2

R2-2305946 On SL-U LBT failure Intel Corporation discussion Rel-18 NR\_SL\_enh2

R2-2305949 On Shared COT and Enhanced SL LCP Intel Corporation discussion Rel-18 NR\_SL\_enh2

R2-2306055 Discussion on SL C-LBT failure and SL LCP Qualcomm India Pvt Ltd discussion

R2-2306386 Discussion on SL Consistent LBT failure ITL discussion Rel-18

R2-2306519 SL C-LBT Failure recovery Samsung discussion

### 7.15.3 SL-U: SL resource (re)selection, MCSt impacts

Includes further updates/details on e.g. SL resource (re)selection with SL LBT impact, etc.

**MAC resource (re)selection with the consideration of intra-UE LBT impact**

* Option1: Wait for more RAN1 progress (to handle inter-UE LBT impact) (P2:5229)
* Option2: Adopot option 1 of RAN1 agreement
	+ N is (pre)configured (P2:4793)
	+ N is based on UE selection (P2:6525)
* Option3: Up to UE implementation (P1:5090)
* Skip the discussion

**MCSt (questions on the LS: 4618)**

* Question 1
	+ Feasible (P1:6233)
	+ Not feasible
		- Due to need of HARQ feedback (4806)
* Question 2
	+ Feasible (P4:6256)
	+ Not feasible (P1:5229)
		- Existing resource (re)selection triggering is per TB independently
		- Unclear how to derive a single set of parameters for multiple TBs
* Question 3
	+ Feasible (P5:5090/5177/P5:6256)
		- Based on what?
	+ Not feasible
* Preferred option from RAN2 point of view
	+ Option 1 (P1:4806)
	+ Option 2 (P4:4793/P1:5284)
	+ Option 3 (P3:6525)
* [AT122][509][V2X/SL] Discussion on MCSt (OPPO)

 **Scope:** Discuss RAN2 response/feedback for the questions in RAN1 LS. Discuss which option is preferable from RAN2 point of view (with consideration of RAN2 impacts).

 **Intended outcome:** Discussion summary in R2-2306714.

**Deadline:** To be treated in comeback session 5/25.

**MCSt (FFS whether SL LBT failure triggers resource (re)selection or not)**

* Yes (P3:4806/P4-5:5686)
* No (P3:4793)
* Skip the discussion

R2-2304667 Discussion on Resource (Re)selection OPPO discussion Rel-18 NR\_SL\_enh2

R2-2306233 Discussion on R1 LS on MCSt OPPO discussion Rel-18 NR\_SL\_enh2

R2-2304683 Consideration on MCSt impact NEC discussion NR\_SL\_enh2

R2-2304684 SL resource (re)selection NEC discussion NR\_SL\_enh2

R2-2304793 Discussion on SL resource (re)selection and MCSt impact LG Electronics Inc. discussion NR\_SL\_enh2

R2-2304806 Consideration on SL resource (re)selection and MCSt Huawei, HiSilicon discussion Rel-18 NR\_SL\_enh2

R2-2304976 Discussion on SL resource (re)selection for SL-U ZTE Corporation, Sanechips discussion Rel-18 NR\_SL\_enh2

R2-2305028 Resource selection and reselection for SL-U Ericsson discussion Rel-18 NR\_SL\_enh2

R2-2305090 Discussion on resource (re)selection and MCSt in SL-U Apple discussion Rel-18 NR\_SL\_enh2

R2-2305175 Mode 2 Resource Selection Considering LBT Impacts InterDigital discussion Rel-18 NR\_SL\_enh2

R2-2305176 Discussion on RAN1 LS on MCSt InterDigital discussion Rel-18 NR\_SL\_enh2

R2-2305177 Draft Response LS on MCSt resource (re)selection InterDigital LS out Rel-18 NR\_SL\_enh2-Core To:RAN1

R2-2305229 Discussion on resource allocation for SL-U Xiaomi discussion

R2-2305284 Discussion on MCSt CATT,GOHIGH discussion Rel-18 NR\_SL\_enh2

R2-2305686 Discussion on resource (re)selection for NR SL-U Lenovo discussion Rel-18

R2-2305923 On MCSt impacts on the resource selection procedure Nokia, Nokia Shanghai Bell discussion Rel-18 NR\_SL\_enh2

R2-2306256 Discussion on Multi-Consecutive Slots transmission vivo discussion

R2-2306525 SL resource (re)selection Samsung discussion

### 7.15.4 SL-U: Others

Includes further updates/details on e.g. leftovers on SL CAPC, SL DRX and SL CG, etc.

**Consideration of default priority in best-matched rule?**

* Yes (P1:4807/P1:4977/P1:5091/P3:5687)
	+ Default priority 1 is mapped to SL CAPC 1?
* No (P2:4757)

[Huawei]: It shouldn’t be default priority. It is configured priority for non-standardized PQI. Priority 1 or 2 should be mapped to CAPC 1. [Xiaomi]: It sounds not fair because we didn’t consider default priority in standardized PQI. [Lenovo]: We considered mission critical service in standardized PQI. Just mapping priority 1 to CAPC 1 should be enough.

[Session chair]: Consideration of priority (priority 1 is mapped to CAPC 1. Otherwise based on PDB)?

- Yes: 3 companies support

- No: 9 companies support

* Priority is not considered in best-matched rule.

**Confirm the WA#1**

* Working assumption: In case of multiple PSFCH occasion per PSCCH/PSSCH, if HARQ A/N is successfully transmitted in one PSFCH occasion, Rx UE starts the sl-drx-HARQ-RTT-Timer for the corresponding Sidelink process in the first slot after the end of the corresponding PSFCH transmission carrying the SL HARQ feedback.
* Working assumption: In case of multiple PSFCH occasion per PSCCH/PSSCH, if LBT failure happens in all PSFCH occasions, Rx UE starts the sl-drx-HARQ-RTT-Timer for the corresponding Sidelink process in the first slot after the end of the last PSFCH occasion for the SL HARQ feedback.
	+ Yes (P3:4757/P1:4794/P3:4807/P9:5230)
	+ Yes only for UC (P1:6384)
		- For GC, Rx UEs start the sl-drx-HARQ-RTT-Timer for the corresponding Sidelink process in the first slot following the last PSFCH occasion for SL HARQ feedback (P3: 6384)

[Session chair]: For GC, think P3 in R2-2306384 raised a valid issue. We can further think for GC.

* Working assumptions are confirmed at least for UC.

**Confirm the WA#2**

* Working assumption: Not define shared COT as SL DRX active time.
	+ Yes (P4:4757/P8:4977/P2:5091/P8:5230)
	+ No, wait for RAN1 conclusion on additional ID (P2:4794/P4:4807/P9:5687)

[OPPO]: Better to confirm WA this meeting otherwise we leave too many dependencies with RAN1. If additional ID is decided in RAN1, we can revisit it. [LG]: Whether to have assistence information or not may also impact on this WA. [IDC]: Agree with OPPO.

[Session chair]: Define shared COT as SL DRX active time?

- Yes: 5 companies support

- No: 7 companies support

* Confirm the WA. If RAN1 introduces additiona ID, we can revisit it.

**SL CAPC when CAPC of the default SLRB is not configured (P1:4757)**

* Option1: up to UE implementation to decide it based on the CAPC of the associated QoS flows
* Option2: select the lowest CAPC priority level (highest CAPC value) among the associated QoS flows (P2:4807, P4:5687)

[ZTE, Apple, LG, NEC, Xiaomi]: Prefer option1. [Lenovo, Huawei, IDC, Intel]: Option1 may bring fairness issue. Support option2.

* Option2 is agreed.

R2-2304757 Discussion on the other remaining issues in SL-U OPPO discussion Rel-18 NR\_SL\_enh2

R2-2304794 Discussion on SL-U others LG Electronics Inc. discussion NR\_SL\_enh2

R2-2304807 Impact on SL CAPC and SL DRX Huawei, HiSilicon discussion Rel-18 NR\_SL\_enh2

R2-2304977 Discussion on SL CAPC and SL CG ZTE Corporation, Sanechips discussion Rel-18 NR\_SL\_enh2

R2-2305030 Other aspects on SL-U Ericsson discussion Rel-18 NR\_SL\_enh2

R2-2305091 Discussion on remaining issues on CAPC and SL DRX in SL-U Apple discussion Rel-18 NR\_SL\_enh2

R2-2305230 Discussion on other aspects for SL-U Xiaomi discussion

R2-2305285 Consideration on CAPC and LBT impacts CATT discussion Rel-18 NR\_SL\_enh2

R2-2305687 Other remaining issue for NR SL-U Lenovo discussion Rel-18

R2-2305947 Discussion on SL-U open aspects Intel Corporation discussion Rel-18 NR\_SL\_enh2 R2-2302873

R2-2306384 Discussion on SL DRX in SL-U ITL discussion Rel-18

R2-2306523 Remaining issues Samsung discussion

### 7.15.5 SL-FR2

Includes e.g. identification of RAN2 scopes and proposals, further updates/details from RAN2#121bis-e discussion, updates/details of related RAN1 discussion, etc.

R2-2304758 Discussion on SL-FR2 impact OPPO discussion Rel-18 NR\_SL\_enh2

R2-2304685 Sidelink Operation on FR2 NEC discussion NR\_SL\_enh2

R2-2304718 Discussion on SL-FR2 aspects in RAN2 Nokia, Nokia Shanghai Bell discussion Rel-18

R2-2304765 Discussion on FR2 vivo discussion Rel-17

R2-2304796 Discussion on RAN2 aspects of SL-FR2 LG Electronics Inc. discussion NR\_SL\_enh2

R2-2304847 Discussion on SL-FR2 Huawei, HiSilicon discussion Rel-18 NR\_SL\_enh2

R2-2304978 Discussion on sidelink FR2 ZTE Corporation, Sanechips discussion Rel-18 NR\_SL\_enh2

R2-2305029 SL in FR2 Ericsson discussion Rel-18 NR\_SL\_enh2

R2-2305092 Discussion on RAN2 aspects of SL FR2 Apple discussion Rel-18 NR\_SL\_enh2

R2-2305220 Discussion on SL-FR2 impact to RAN2 Xiaomi discussion

R2-2305236 Discussion on sidelink operation on FR2 licensed spectrum China Telecom discussion Rel-18 NR\_SL\_enh2

R2-2305286 Discussion on Sidelink Operation on FR2 CATT discussion Rel-18 NR\_SL\_enh2

R2-2305688 Discussion on FR2 operation for NR SL Lenovo discussion Rel-18

R2-2306056 Discuss on SL-FR2 Qualcomm India Pvt Ltd discussion

R2-2306472 RAN2 Aspects of NR Sidelink Operation in FR2 Fraunhofer IIS, Fraunhofer HHI discussion Rel-18 R2-2303483

R2-2306522 SL-FR2 Samsung discussion

### 7.15.6 SL-CA

Includes further updates/details on SL CA. Note this work assumes a very high degree of reuse from LTE V2X.

**FFS on backward compatibility issue in SL CA (for GC/BC)**

* No issue with service-to-carrier mapping (P3:4668)
* Need TX profile to handle the compatibility issue (P2:5093)

**FFS on how to determine per carrier CBR**

* Same principle as LTE V2X CA (P4:4668)
* New definition of carrier level CBR (P2:4848/P6:5093)

**FFS on TX carrier (re)selection triggers, LCP impact, and CBR-based carrier reselection/keeping for UC**

* Same as GC/BC (P12:4668/P1:4848/P8-10:4979/P5:5031/P5:5093/P1:5948)

Agreement:

Proposal 10: For TX carrier (re)selection triggers in NR sidelink CA, reuse the triggers for TX carrier (re)selection per sidelink process in LTE sidelink CA as follows at least for GC/BC

if the resource (re)selection is triggered with the sidelink process.

if there is no sidelink grant associated with the sidelink process on any carrier allowed for the STCH as indicated by upper layers (i.e., RRC layer and V2X layer).

FFS on unicast case.

Agreement:

Proposal 7 For LCP, only allow the LCHs having a priority whose associated CBR threshold for reselection is no lower than the CBR of the carrier when the carrier is (re-)selected. FFS on how to determine the per-carrier CBR at least for GC/BC.

FFS on unicast case.

Proposal 5 NR SL CA TX carrier (re)selection follows LTE CA solution, i.e., define 1) per-carrier-per-priority CBR threshold for carrier (re)selection, and 2) per-carrier-per-priority CBR threshold for carrier keeping. And final carrier selection is done based on the lowest CBR value across carriers. Where the priority is the LCH priority.

FFS on unicast case.

[NEC, IDC]: UE capability aspect can be further considered for UC.

* The copied agreement for GC/BC is also applicable for UC. TX carrier reselection is done among the carriers that peer UE also supports.

**FFS on LCID to identify duplicated SL LCHs for UC**

* Same as GC/BC (P13:4668/P9:4832/P4:4848/P8:5093)
* Configurable by PC5-RRC (P11:4979)

Agreement:

Proposal 16: For NR sidelink PDCP duplication, reuse the hard-coded way for paired sidelink LCID to identify duplicated sidelink LCHs (i.e. for a unified design for all Bcast/Gcast). The specific SL LCID values occupied are left to Stage-3. FFS on Unicast case.

[NEC, Nokia, ZTE, Lenovo, LG]: Configuration of LCID to identify duplicated SL LCHs (e.g. PC5-RRC) would be more efficient option. [OPPO, Huawei]: To last RAN, we need to follow LTE solution. Gain from configuration is not clear. [Apple, Ericsson]: Prefer common solution for all cast types.

* The copied agreement for GC/BC is also applicable for UC.

**Criterion for packet duplication**

* SLRB configures PDCP duplication or not (P5:4979)
	+ SL PDCP duplication configuration via PC5-RRC for UC (P5:4832)
* Threshold of reliability from QoS profile (P3:4686)

**SL CA before unicast link is established (P16-17:4832)**

* Yes or No?

**PDCP duplication/SL CA for SL SRB (P6-7:4832)**

* Yes or No?

**DTX based SL RLF in SL CA**

* The counting is calculated per carrier or across all carriers (P15:4668/P2:4686/P11:5031/P5:5231)
* Enhancement of DTX based SL RLF with the consideration of per carrier and/or across all carriers in SL CA

R2-2304668 Discussion on Carrier Aggregation OPPO discussion Rel-18 NR\_SL\_enh2

R2-2304686 Sidelink CA operation NEC discussion NR\_SL\_enh2

R2-2304798 Discussion on remaining issues of SL-CA enhancements LG Electronics Inc. discussion NR\_SL\_enh2

R2-2304832 Further discussion on the support of CA for NR Sidelink Mode-2 vivo discussion Rel-18

R2-2304848 Discussion on SL CA operation Huawei, HiSilicon discussion Rel-18 NR\_SL\_enh2

R2-2304979 Discussion on sidelink CA ZTE Corporation, Sanechips discussion Rel-18 NR\_SL\_enh2

R2-2305031 Aspects of SL CA Ericsson discussion Rel-18 NR\_SL\_enh2

R2-2305093 Discussion on Sidelink CA Apple discussion Rel-18 NR\_SL\_enh2

R2-2305178 Carrier Aggregation for NR SL InterDigital discussion Rel-18 NR\_SL\_enh2

R2-2305231 Discussion on carrier aggregation for NR sidelink Xiaomi discussion

R2-2305287 Discussion on NR sidelink CA CATT discussion Rel-18 NR\_SL\_enh2

R2-2305358 Discussion on carrier selection for SL CA NEC discussion Rel-18 NR\_SL\_enh2

R2-2305689 Discussion on multi-carrier operation for NR SL Lenovo discussion Rel-18

R2-2305948 Discussion on NR SL Carrier Aggregation Intel Corporation discussion Rel-18 NR\_SL\_enh2

R2-2306057 Discussion on SL CA Qualcomm India Pvt Ltd discussion

R2-2306315 On support of Sidelink CA in NR Nokia, Nokia Shanghai Bell discussion

R2-2306471 RAN2 Aspects of NR Sidelink Carrier Aggregation Fraunhofer IIS, Fraunhofer HHI discussion Rel-18 R2-2303482

R2-2306518 SL CA for unicast Samsung discussion

### 7.15.7 SL-Co-Ex

Any required RAN2 discussion or spec impact to complete SL Co-Ex.

**No stage-2 RAN2 work (except capturing RAN/RAN1 agreements in MAC if needed) (4669)**

**List of raised RAN2 works**

* RAN1 FFS on frequency domain resource restriction (4849)
	+ RAN1 will make decision and RAN2 just captures RAN1 conclusion?
* UE behaviour on subsequent NR slot when the first NR slot overlapping with LTE subframe is dropped (4980)
	+ RAN1 scope? For same TB case, R1 agreed to rely on UE implementation. FFS for different TB case.
* Random resource selection enhancement in case of Co-Ex (5032)
	+ Not included in WID
* Further optimization based on whether SL HARQ feedback is enabled or not for the PSSCH (5094)
	+ RAN1 scope? Note it can be based on resource pool configuration as in legacy
* RAN2 impacts from RAN1 conclusion of power limitation for the second slot power (5825)
	+ RAN1 decided it’s up to UE implementation
* Further rule for the 2nd slot selection (5825)
	+ RAN1/RAN scope? Capturing RP conclusion is sufficient.
* [AT122][507][V2X/SL] Any essential stage-2 RAN2 work for SL Co-Ex (OPPO)

 **Scope:** Discuss whether there is any essential stage-2 RAN2 work for SL Co-Ex completion (based on the proposals in contributions).

 **Intended outcome:** Discussion summary in R2-2306712

**Deadline:** To be handled in comeback session in 5/25 (KST)

R2-2304669 Discussion on LTE-V2x and NR-V2x Co-Existence OPPO discussion Rel-18 NR\_SL\_enh2

R2-2304830 Discussion on RAN2 impact on LTE sidelink and NR sidelink co-existence vivo discussion Rel-18

R2-2304849 Support of co-channel coexitence for LTE SL and NR SL Huawei, HiSilicon discussion Rel-18 NR\_SL\_enh2

R2-2304980 Discussion on Co-channel coexistence for LTE sidelink and NR sidelink ZTE Corporation, Sanechips discussion Rel-18 NR\_SL\_enh2

R2-2305032 Discussion and LTE and NR coexistence Ericsson discussion Rel-18 NR\_SL\_enh2

R2-2305094 Discussion on resource selection in co-channel existence Apple discussion Rel-18 NR\_SL\_enh2

R2-2305288 Discussion on Coexistence for LTE sidelink and NR sidelink CATT discussion Rel-18 NR\_SL\_enh2

R2-2305690 Discussion on co-channel coexistence for LTE and NR SL Lenovo discussion Rel-18

R2-2305825 Identified issues for Sidelink Coexistence Nokia, Nokia Shanghai Bell discussion Rel-18 NR\_SL\_enh2

R2-2306058 Discussion on SL Co-existence Qualcomm India Pvt Ltd discussion

R2-2306521 SL Co-Ex Samsung discussion