**3GPP TSG RAN meeting #93e RP-21xxxx**

**Electronic Meeting, Sep. 13-17, 2021**

## Status Report to TSG

**Agenda item:** 9.3.1.3

|  |  |
| --- | --- |
| **WI / SI Name** |  |
| included in this status report | Study Item: No | Core part: Yes | Performance part:Yes | Testing part:No |
| **Acronym** | NR\_SL\_enh |
| **Unique ID** | 860042 |
| **TSG Tdoc of latest approved WI/SI description (if any)** | RP-202846 |
| **Target Completion Date****(indicate if changed)** | Study Item: mm/yyyy | Core part: 03/2022 | Performance part: 09/2022 | Testing part: mm/yyyy |
| **Overall Completion level** | Study Item: xx % | Core part: 60% | Performance Part: 0% | Testing part: xx% |

RAN1 progress on the inter-UE coordination for Mode 2 enhancements and resource allocation for power saving is behind schedule, so RAN guidance is necessary so that RAN1 can prioritize the completion of essential functionalities of the objectives.

Note: Overall completion level percentage numbers should use one of the colors below:

* xx%: Normal progress, no RAN plenary action needed
* xx%: Progress behind schedule, may need RAN plenary intervention. If so, SR should clearly define requested action
* xx%: Progress critically behind, RAN plenary shall intervene. SR should define requested action

**Source:**

|  |  |
| --- | --- |
| **Leading WG** | RAN WG1 |
| **Rapporteur** | **Name** | Seungmin Lee |
| **Company** | LG Electronics |
| **Email** | edison.lee@lge.com |

## 1 Work plan related evaluation

|  |  |
| --- | --- |
| **Do you want to modify the time budget for this WI/SI compared to what was endorsed at the last RAN meeting?** | No |

*If you answered No: Then please remove the Excel file from the zip file of this status report.*

*If you answered Yes: Then please fill out the attached Excel template to request a modification of the time budgets for your WI /SI. The Excel table has to be filled out for all affected RAN WGs and up to the target date of the WI/SI. The basis are the endorsed time budgets of the last RAN meeting. Please highlight all changes of the values.
 One time unit (TU) corresponds to ~ 2 hours in the meeting.
 If this status report covers a WI with Core and Performance part, then please have one line for each in the attached Excel table.
 Note: If no Excel table is attached, then this means no time budget change.*

**Additional explanations/motivations for the time budget changes in the attached Excel table:**

## 2. Detailed progress in RAN WGs since last TSG meeting (for all involved WGs)

 NOTE: Agreements and Open issues impacted cross-TSG aspects shall be explicitly highlighted

## 2.1 RAN1

#### 2.1.1 Agreements

**RAN1#106-e**

Regarding resource allocation for power saving, the following agreements were made:

* Agreements on details of periodic-based partial sensing and contiguous partial sensing operations
	+ In periodic-based partial sensing, UE monitoring of periodic sensing occasions between triggering slot n and the first slot of the selected Y candidate slots subject to processing time restriction is performed as part of resource (re)selection.
	+ Conditions in which contiguous partial sensing is performed by UE, when at least all of the followings are met:
		- L1 [is expected to be or] is triggered by higher layer to report resources for resource (re-)selection in a mode 2 Tx pool
			* FFS: When the trigger will be received by L1
		- The resource pool is (pre-)configured to enable partial sensing
		- Partial sensing is configured by higher layer in the UE

* + For a resource pool (pre-)configured with at least partial sensing and UE is configured by its higher layer for partial sensing,
		- Periodic-based partial sensing and contiguous partial sensing schemes are supported for resource re-evaluation and pre-emption checking
			* FFS details of partial sensing for re-evaluation and pre-emption checking, including any restrictions / conditions on performing PBPS and CPS, subset of resources, timing, candidate resource set (SA) and etc
		- Same as in Rel-16, the higher layer indicates a set of resources $(r\_{0},r\_{1},r\_{2},…) $and/or a set of resources $(r\_{0}^{'},r\_{1}^{'},r\_{2}^{'},…)$ for re-evaluation and/or pre-emption checking, respectively
			* Pre-emption checking is enabled according to the Release-16 interpretation of *sl-PreemptionEnable*.
				+ FFS: If additional enhancements are needed for enabling/disabling
		- The triggering of re-evaluation and pre-emption checking is as in R16.

* + When UE performs only contiguous partial sensing (CPS) in a mode 2 Tx pool with periodic reservation for another TB (*sl-MultiReserveResource*) disabled, and a resource (re)selection is triggered in slot n,
		- The resource selection window (RSW) is [*n+T1*, *n+T2*] where *T2* is defined based on step 1) of Rel-16 TS 38.214 Sec. 8.1.4
			* FFS whether the resource selection window [*n+T1*, *n+T2*] should be confined within a set of periodic set of resources and its relationship with SL-DRX
		- On the sensing window [*n+TA*, *n+TB*] for CPS,
			* Details of TA and TB values based on the agreements from previous RAN1 meetings
			* FFS whether and how to define a minimum CPS window size, including (pre-)configurability and the case when *TB* - *TA* is smaller than the minimum CPS window size
			* FFS whether and how to define a maximum value / upper bound for TB with respect at least to the minimum RSW size and the remaining PDB, including (pre-)configurability
		- FFS how a set of candidate resource (*SA*) is initialized considering candidate single-slot resources, including
			* Whether and how to define a minimum size for the RSW (e.g., Rel-16 T2min), including (pre-)configurability
			* Whether the set *SA* is confined within a set of Y candidate slots within the RSW
		- UE performs resource exclusion from the set *SA* based on at least all available sensing results and based on step 6) and 7) of Rel-16 TS 38.214 Sec. 8.1.4
		- Note, re-evaluation and pre-emption checking in a resource pool with periodic reservation for another TB (*sl-MultiReserveResource*) disabled is considered separately.
		- FFS: Details on *T1*
	+ When UE performs periodic-based and contiguous partial sensing schemes in a mode 2 Tx pool with periodic reservation for another TB (*sl-MultiReserveResource*) enabled,
		- For a resource (re)selection procedure triggered by aperiodic transmission (*P*rsvp\_TX*=0*) in slot n,
			* The resource selection window (RSW) is [*n+T1*, *n+T2*], and *T1* and *T2* are defined in the same way according to step 1) of Rel-16 TS 38.214 Sec. 8.1.4
				+ FFS whether UE determines a new set of Y candidate slots within the RSW and monitors corresponding periodic sensing occasions between slot n and the first slot of the new Y candidate slots subject to processing constraints
				+ FFS how to initialize a set of candidate resource (*SA*) for the triggered resource (re)selection procedure and which partial sensing scheme(s) and results can be used for resource exclusion in the resource (re)selection procedure
				+ FFS whether the resource selection window [*n+T1*, *n+T2*] should be confined within a set of periodic set of resources and its relationship with SL-DRX
		- Note, re-evaluation and pre-emption checking based on periodic-based and contiguous partial sensing schemes is considered separately

* + When UE performs periodic-based and contiguous partial sensing schemes in a mode 2 Tx pool with periodic reservation for another TB (*sl-MultiReserveResource*) enabled,
		- For a resource (re)selection procedure triggered by periodic transmission (*P*rsvp\_TX*≠0*) in slot n
			* A set of candidate resource (*SA*) is initialized to the set of selected *Y* candidate slots of PBPS
				+ UE performs contiguous partial sensing in [n+T*A*, n+T*B*] for resource exclusion from the initialized candidate resource set (*SA*)

FFS details of *TA* and *TB* based on the agreement(s) from previous RAN1 meetings

* + - Note, re-evaluation and pre-emption checking based on periodic-based and contiguous partial sensing schemes is considered separately
	+ FFS: The condition under which UE performs periodic-based and contiguous partial sensing schemes in a mode 2 Tx pool with periodic reservation for another TB (*sl-MultiReserveResource*) enabled
* Agreements on details of random resource selection
	+ For random resource selection in a resource pool (pre-)configured with full/partial sensing and random resource selection, down-select to one of the followings in RAN1#106bis-e
		- Option 1: A priority threshold value or a range of priority levels is (pre-)configured for the resource pool, below or within which random resource selection is allowed
			* Note, lower value means higher priority
			* FFS whether resource pool partitioning can be additionally applied
		- Option 2: Increase the priority for the transmission based on random selection and indicate the new priority value in the priority field in the 1st-stage SCI
			* FFS: An extra field is added in SCI for indicating the original priority value associated with QoS requirement,
			* FFS: A 1-bit field in the SCI indicates that the UE is performing random resource selection, or
			* FFS: An extra field is added in SCI for indicating the mapping to the original priority value associated with QoS requirement.
		- Option 7: Exclude resources reserved by UE performing random selection without re-evaluation / pre-emption checking, regardless of their priorities. E.g. a 1-bit field in the SCI indicates that the UE is performing random resource selection and not performing re-evaluation and pre-emption checking
		- Option 12: No special consideration
* Agreements on reply LS to R1-2106413
	+ Regarding RAN2’s question, in RAN1’s opinion it is feasible, other than in the following exceptional cases:
		- SL transmission dropping due to prioritization or congestion control
		- Due to re-evaluation, a re-selected resource is earlier than a reserved resource by UE implementation in Mode 2
		- If (pre-)configured with many-to-one mapping between Tx and Rx resource pools in some cases (e.g., when PSFCH is not configured)
	+ The final LS is in R1-2108622.
* Agreements on reply LS to R1-2100021
	+ A UE can perform SL reception of PSCCH and RSRP measurement for sensing during its SL DRX inactive time.
		- FFS: When such reception and measurement is performed, whether it is subject to specification, or is up to UE implementation
		- FFS: Other details
	+ LS to RAN2 on SL DRX design is endorsed in R1-2108580.

Regarding inter-UE coordination for mode 2 enhancements, the following agreements and working assumptions were made:

* Agreements and working assumptions on details of Scheme 1 for inter-UE coordination
	+ For scheme 1, the following inter-UE coordination information signalling from UE-A is supported. FFS details including condition(s)/scenario(s) under which each information is enabled to be sent by UE-A and used by UE-B.
		- Set of resources preferred for UE-B’s transmission
		- Set of resources non-preferred for UE-B’s transmission
	+ In scheme 1, the following is supported for UE(s) to be UE-A(s)/UE-B(s) in the inter-UE coordination information transmission triggered by an explicit request in Mode 2:
		- A UE that sends an explicit request for inter-UE coordination information can be UE-B
		- A UE that received an explicit request from UE-B and sends inter-UE coordination information to the UE-B can be UE-A
		- (Working assumption) At least a destination UE of a TB transmitted by UE-B can be UE A
		- The above feature can be enabled or disabled or controlled by (pre-)configuration
		- FFS: Details on how to support this, including (pre-)configuration signaling granularity
		- FFS: Additional details and conditions on UE-A and UE-B
	+ (Working Assumption) In scheme 1, the following is supported for UE(s) to be UE-A(s)/UE-B(s) in the inter-UE coordination information transmission triggered by a condition other than explicit request reception in Mode 2:
		- A UE that satisfies the condition mentioned in the main bullet and sends inter-UE coordination information is UE-A
		- A UE that received inter-UE coordination information from UE-A and uses it for resource (re-)selection is UE-B
		- The above feature can be enabled or disabled or controlled by (pre-)configuration
			* FFS: Details on how to support this, including (pre-)configuration signaling granularity
		- FFS: Additional details and conditions on UE-A and UE-B
	+ In scheme 1, at least following UE-B’s behavior in its resource (re-)selection is supported when it receives inter-UE coordination information from UE-A:
		- For preferred resource set, the following two options are supported:
			* Option A): UE-B’s resource(s) to be used for its transmission resource (re-)selection is based on both UE-B’s sensing result (if available) and the received coordination information
				+ UE-B uses in its resource (re-)selection, resource(s) belonging to the preferred resource set in combination with its own sensing result

UE-B uses in its resource (re-)selection, resource(s) not belonging to the preferred resource set when condition(s) are met

FFS: Details of condition(s)

This option is supported when UE-B performs sensing/resource exclusion

FFS: Other details (if any)

* + - * Option B): UE-B’s resource(s) to be used for its transmission resource (re-)selection is based only on the received coordination information
				+ UE-B uses in its resource (re-)selection, resource(s) belonging to the preferred resource set

This option is supported at least when UE-B does not support sensing/resource exclusion

FFS: Whether the support is conditional or UE capability

FFS: Other details (if any)

* + - * FFS: Other option(s), and other details (if any)
		- For non-preferred resource set,
			* UE-B’s resource(s) to be used for its transmission resource (re-)selection is based on both UE-B’s sensing result (if available) and the received coordination information
				+ UE-B excludes in its resource (re-)selection, resource(s) overlapping with the non-preferred resource set

FFS: Details including

Whether/how UE-B can use in its resource (re-)selection, resource(s) overlapping with the non-preferred resource set, definition of the overlap, and other details (if any)

When UE-B excludes in its resource (re-)selection, resource(s) overlapping with the non-preferred resource set

* + - * + FFS: UE-B reselects in its resource (re-)selection, resource(s) to be used for its transmission when the resource(s) are fully/partially overlapping with the non-preferred resource set
			* FFS: Other option(s), and other details (if any)
	+ In scheme 1, at least the following is supported to determine inter-UE coordination information of preferred resource set:
		- UE-A considers any resource(s) satisfying all the following condition(s) as set of resource(s) preferred for UE-B’s transmission
			* Condition 1-A-1:
				+ Resource(s) excluding those overlapping with reserved resource(s) of other UE identified by UE-A whose RSRP measurement is larger than a RSRP threshold

FFS: Other details (if any)

* + - * FFS: Condition 1-A-2:
				+ Resource(s) excluding slot(s) where UE-A, when it is intended receiver of UE-B, does not expect to perform SL reception from UE-B

FFS: Other details (if any)

* + - * FFS: Condition 1-A-3:
				+ Resource(s) satisfying UE-B’s traffic requirement (if available)

FFS: Other details (if any)

* + - * FFS: Other condition(s)
		- FFS: Other details (if any)
	+ In scheme 1, at least the following is supported to determine inter-UE coordination information of non-preferred resource set:
		- UE-A considers any resource(s) satisfying at least one of the following condition(s) as set of resource(s) non-preferred for UE-B’s transmission
			* Condition 1-B-1:
				+ Reserved resource(s) of other UE identified by UE-A from other UEs’ SCI (including priority field) and RSRP measurement

FFS: Other details (if any)

* + - * FFS: Condition 1-B-2:
				+ Resource(s) (e.g., slot(s)) where UE-A, when it is intended receiver of UE-B, does not expect to perform SL reception from UE-B

FFS: Other details (if any)

* + - * FFS: Other condition(s)
		- FFS: Other details (if any)
* Agreements and working assumptions on details of Scheme 2 for inter-UE coordination
	+ For scheme 2, the following inter-UE coordination information signalling from UE-A is supported. FFS details including condition(s)/scenario(s) under which each information is enabled to be sent by UE-A and used by UE-B
		- Presence of expected/potential resource conflict on the resources indicated by UE-B’s SCI
			* FFS: UE behaviour when the presence of expected/potential resource conflict is detected by the transmitter
		- FFS: Whether to additionally support the presence of detected resource conflict on the resources indicated by UE-B’s SCI
	+ In scheme 2, at least the following is supported for UE(s) to be UE-A(s)/UE-B(s) in the inter-UE coordination transmission triggered by a detection of expected/potential resource conflict(s) in Mode 2:
		- A UE that transmitted PSCCH/PSSCH with SCI indicating reserved resource(s) to be used for its transmission, received inter-UE coordination information from UE-A indicating expected/potential resource conflict(s) for the reserved resource(s), and uses it to determine resource re-selection is UE-B
		- A UE that detects expected/potential resource conflict(s) on resource(s) indicated by UE-B’s SCI sends inter-UE coordination information to UE-B, subject to satisfy one of the following conditions, is UE-A
			* (Working assumption) At least a destination UE of one of the conflicting TBs, i.e., TBs to be transmitted in the expected/potential conflicting resource(s)
				+ Whether a non-destination UE of a TB transmitted by UE-B can be UE-A is (pre-)configured
			* FFS: Additional details and condition(s) on UE-A and UE-B
		- The above feature can be enabled or disabled or controlled by (pre-)configuration
			* FFS: Details on how to support this, including (pre-)configuration signaling granularity
		- FFS: Definition of expected/potential resource conflict(s) and other details (if any)
	+ In scheme 2, the following UE-B’s behavior in its resource (re)selection is supported when it receives inter-UE coordination information from UE-A:
		- UE-B can determine resource(s) to be re-selected based on the received coordination information
			* UE-B can reselect resource(s) reserved for its transmission when expected/potential resource conflict on the resource(s) is indicated
				+ FFS: Other details (if any)
	+ In scheme 2, at least the following is supported to determine inter-UE coordination information:
		- Among resource(s) indicated by UE-B’s SCI, UE-A considers that expected/potential resource conflict occurs on the resource(s) satisfying at least one of the following condition(s):
			* Condition 2-A-1:
				+ Other UE’s reserved resource(s) identified by UE-A are fully/partially overlapping with resource(s) indicated by UE-B’s SCI in time-and-frequency
				+ FFS: Other details (if any)
				+ FFS: Whether/how to specify additional criteria and other details (if any) including signaling details of conflict indication
			* (Working Assumption) Condition 2-A-2:
				+ Resource(s) (e.g., slot(s)) where UE-A, when it is intended receiver of UE-B, does not expect to perform SL reception from UE-B due to half duplex operation

FFS: Other details (if any)

* + - * FFS: Other condition(s)
		- FFS: Other details (if any)

#### 2.1.2 Remaining Open issues

The followings are the remaining open issues:

* Physical layer aspects on resource allocation to reduce UE’s power consumption including;
	+ Details of partial sensing based resource selection and random resource selection
	+ Details and condition(s) in which re-evaluation and pre-emption can be performed by UEs performing sensing
	+ Whether/how to support congestion control for power saving resource allocation schemes
	+ Impacts of sidelink DRX on physical layer, if any
* Physical layer aspects on solution(s) on the enhancement(s) in mode 2 for enhanced reliability and reduced latency including
	+ Details and condition(s) to which inter-UE coordination scheme is applied
	+ Details of inter-UE coordination information and how/when it is generated and sent by UE-A
	+ Details of UE-B’s behaviour on how/when it takes inter-UE coordination information into account in its resource (re)-selection

## 2.2 RAN2

#### 2.2.1 Agreements

**RAN2#115-e**

Regarding sidelink DRX, the following agreements and working assumptions were made:

* Agreements on Tx profiles
* For GC/BC, TX profile is introduced in Rel-17 for sidelink enhancement. FFS whether a TX profile identifies a Release, or one or more sidelink feature groups.
* RAN2 understand a service type can be mapped to a TX profile, i.e. V2X and ProSe.
* A TX profile is indicated from upper layer to AS layer. FFS whether a TX profile needs to be provided with service type information or L2 id.
* For GC/BC, a Rel-17 TX UE shall only assume SL DRX for the RX UEs when the associated TX profile corresponding to support of SL DRX. FFS whether a TX profile needs to be provided with service type information or L2 id.
* For GC/BC only communication, a Rel-17 RX UE determines SL DRX is used if all service types/L2 ids of interest have an associated TX profile corresponding to support of SL DRX. A Rel-17 RX UE enables SL DRX operation for a service type/L2 id with the associated TX profile.
* For UC, for SL transmissions after PC5-RRC connection is established, no backward compatibility issue of SL DRX is assumed, i.e. backward compatibility is handled based on PC5-RRC UE capability signalling.
* Send an LS to SA2 to inform them of the RAN2 agreements related to TX profile.
* Agreements on Uu DRX timer impact
* When sl-PUCCH-Config is configured but the PUCCH is not transmitted due to UL/SL prioritization, the TX UE should start the SL-specific drx-HARQ-RTT-Timer in Uu for the corresponding SL HARQ process in the first slot/symbol after the end of the corresponding PUCCH resource. FFS on slot or symbol.
* When sl-PUCCH-Config is not configured, the SL-specific drx-RetransmissionTimer should be supported.
* SL-specific drx-RetransmissionTimer is started at the first symbol after the end of last PSSCH resource scheduled through one DCI (with the assumption RAN2 agrees not to support SL-specific drx-HARQ-RTT-Timer but to support SL-specific drx-RetransmissionTimer when sl-PUCCH-Config is not configured, when sl-PSFCH-Config is configured). FFS the SL-specific drx-RetransmissionTimer is started at the first slot after the end of last PSSCH resource scheduled through one DCI instead.
* SL-specific drx-RetransmissionTimer is started at the first symbol after the end of last PSSCH resource scheduled through one DCI (with the assumption RAN2 agrees not to support SL-specific drx-HARQ-RTT-Timer but to support SL-specific drx-RetransmissionTimer when sl-PUCCH-Config is not configured, when sl-PSFCH-Config is not configured). FFS the SL-specific drx-RetransmissionTimer is started at the first slot after the end of last PSSCH resource scheduled through one DCI instead.
* Agreements on SL DRX timer maintenance
* Inactivity timer is not (pre)configured per QoS profile for unicast in IDLE/INACTIVE or OOC case.
* In groupcast, the RX UE maintains a separate inactivity timer for each L2 Destination ID.
* SL inactivity timer can be supported for all scenarios of groupcast.
* Stopping the inactivity timer to handle L1/L2 mismatch is not supported.
* Specifying mechanisms to use HARQ feedback to handle Inactivity timer mismatch between TX and RX UE (for unicast and groupcast) is not considered in this release.
* Restarting the inactivity timer at the TX UE is not needed upon transmission of an SCI indicating a retransmission.
* Inactivity timer can be used for unicast whether HARQ feedback is enabled or disabled.
* For groupcast, the TX UE restarts its timer corresponding to inactivity timer for the L2 destination ID (used for determining the allowable transmission time) upon reception of new data with the same destination ID.
* HARQ RTT is supported for both HARQ enabled and HARQ disabled cases by allowing HARQ RTT timer to be set to different values. FFS on the specific values that can be used for HARQ disabled case.
* Regardless of whether there is uncertainty or not, in the timing of a retransmission for a HARQ process the RX UE uses a retransmission timer.
* For unicast and groupcast, retransmission timer value is configurable.
* SL HARQ RTT timer and SL Retransmission timer are not used for broadcast transmissions.
* When data is available for transmission to one or more RX UE in DRX, TX UE selects the resources taking into account the active time (current or future) of the RX UE(s) determined by the timers maintained at the TX UE. Details are FFS. FFS whether RAN1 or RAN2 implement this restriction. Send LS to RAN1.
* For unicast, the TX UE selects the resources for the initial transmission associated with any active time (e.g. on duration timer or inactivity timer, or retransmission timer) at the RX UE. How to handle cases when a transmission may cause these timers to be running at the RX UE is FFS. FFS on groupcast. FFS on whether any spec impact.
* For unicast, the TX UE can select the resources for the retransmission associated with any active time (e.g. on duration timer or inactivity timer, or retransmission timer) at the RX UE. How to handle cases when a transmission may cause these timers to be running at the RX UE is FFS. FFS on groupcast. FFS on whether any spec impact.
* For broadcast, the TX UE can select the resources for the initial transmission associated with any active time supported by broadcast (i.e. on duration timer) at the RX UE.
* For broadcast, the TX UE can select the resources for the retransmission associated with any active time supported by broadcast (i.e. on duration timer) at the RX UE.
* Agreements on SL DRX configuration for UC
* For determining SL DRX configuration by TX UE, SL DRX capable RX UE is not mandatory to provide the SL DRX assistance information to TX UE. FFS on the interpretation if assistance information is not provided.
* For SL unicast, RX UE may include its desired SL DRX configuration in the assistance information which is transmitted to TX UE.
* For SL unicast, RX UE may send the SL DRX assistance information to TX UE when the previously transmitted SL DRX assistance information has changed.
* For unicast, a two-step process (i.e., RX UE accepts or rejects TX UE’s suggestion) is adopted as a baseline, i.e., FFS on the following TX/RX UE behaviours when reject happens.

Step 1: TX UE sends RRCReconfigurationSidelink containing a SL DRX configuration to be applied by RX UE to RX UE

Step 2: RX UE replies with a PC5-RRC signalling indicating acceptance or rejection for the SL DRX configuration. FFS on whether the new rejection cause for SL DRX needs to be defined. FFS on whether RRCReconfigurationFailureSidelink or RRCReconfigurationCompleteSidelink is used in Step 2.

* For unicast in IDLE/INACTIVE or OOC, in case there is no SL DRX assistance information received from RX UE, TX UE derives the value of the inactivity timer based on its implementation. FFS on the interpretation if assistance information is not provided.
* For unicast in IDLE/INACTIVE or OOC, if TX UE has obtained assistance information from RX UE, TX UE derives the value of the inactivity timer based on its implementation.
* Agreements on SL DRX configuration for GC/BC
* For SL BC and GC, for in-coverage case, RRC\_CONNECTED TX-UE/RX-UE can obtain DRX configuration from 1) SIB which is delivered via dedicated RRC signalling as in legacy, and from 2) from dedicated RRC signalling during handover, i.e., in an RRCReconfiguration message including reconfigurationWithSyn. Otherwise, RRC\_CONNECTED TX-UE/RX-UE does not expect DRX configuration from dedicated RRC signalling.
* For BC/GC, the on-duration timer length and inactivity timer length (only for GC) are configured per QoS profile.
* For GC, do not pursue per-QoS or per-L2-ID configuration for RTT timer length and retransmission timer length.
* For BC/GC, default DRX configuration(s) can be used for QoS profile(s) which cannot be mapped into DRX configuration configured for the dedicated QoS profile(s).
* For BC/GC, do not pursue DRX command MAC CE in Rel-17.
* Agreements on other remaining issues
* For SL unicast, UE stops on-duration timer and inactivity timer for the unicast link where SL DRX MAC CE is received from peer UE.
* When TX UE sends SL DRX MAC CE is up to UE implementation.
* For unicast, SL BC DRX configuration is applied for DCR message [20/22]. FFS on whether default SL BC DRX configuration or which SL BC DRX configuration for DCR message should be used.
* Working assumption: DRX configuration for V2X group management signaling is out of RAN2 scope.
* For unicast, if serving gNB of a RRC\_CONECTED TX UE determines the DRX configuration of RX UE, TX UE should send the unicast DRX configuration to the RX UE upon receiving the corresponding DRX configuration from the serving gNB.
* For unicast, when to send the DRX configuration to RX UE is up to TX UE implementation for the case that TX UE determines the DRX configuration of the RX UE, i.e. TX UE can send the DRX configuration to RX UE without any restriction.
* For GC, it’s up to UE implementation to determine when the DRX configuration for SL GC communication is applied, i.e. no spec impact.
* For BC, it’s up to UE implementation to determine when the DRX configuration for SL BC communication is applied, i.e. no spec impact.

#### 2.2.2 Remaining Open issues

The followings are the remaining open issues:

* Protocol layer aspects on sidelink DRX for broadcast, groupcast, and unicast including;
	+ Details of timer for unicast/groupcast/broadcast
	+ Details of mechanism aiming to align sidelink DRX wake-up time among the UEs communicating with each other
	+ Details of mechanism aiming to align sidelink DRX wake-up time with Uu DRX wake-up time in an in-coverage UE
* Protocol layer aspects on resource allocation to reduce UE’s power consumption
* Protocol layer aspects on solution(s) on the enhancement(s) in mode 2 for enhanced reliability and reduced latency.

## 2.3 RAN3

#### 2.3.1 Agreements

#### 2.3.2 Remaining Open issues

## 2.4 RAN4

#### 2.4.1 Agreements

**RAN4#100-e: RF**

RAN4 agreed 5 WFs, 1 LS and updated TR38.785 v0.3.0 for SL enhancements in Rel-17 as follows:

* New SL enhancement RF requirements:
	+ Based on RAN4 agreed with 3 WFs and summary papers, we provide detail results as follows:
		- **WF on n14 coexistence evaluation for NR PS UE (R4-2114978)**
			* Issue 1: Protection of B13/n13 UE by n14 PS operation with PC1/PC3
			* Agreements
				+ Option 1: RAN4 does not see the need for the additional coexistence evaluation to protect B13/n13 UE based on evaluation of the difference of coexisting simulation difference between NR SL UE and LTE SL UE
1. Always enable the OLPC in NR SL UE in-coverage: Network always configures the in-coverage NR SL with association to a network cell (e.g., (a) and (b) in Figure 1 in Annex) and avoid the configuration where no network cell is associated NR SL UE (e.g., the configuration of the (c) and (d) in Figure 1 of the annex)
2. NR SL SINR to throughput table is similar with LTE V2X SNIR to throughput table.
	* + - Issue 2: Protection of legacy n14 Uu system in in-coverage NW scenarios
			- Agreements
				* Option 1: RAN4 does not see the need for the additional coexistence evaluation for based on evaluation of the difference of coexisting simulation difference between NR SL UE and LTE SL UE
3. NR SL SINR to throughput table is similar with LTE V2X SNIR to throughput table
4. RB allocations difference between NR SL and LTE V2X is not key factor for Coexisting simulation result. LTE 2 RB is worst case from interference point of view compared with the at least 10RB allocation for NR SL.
	* + **WF on Pemax definition and NR PS REFSENS requirements for SL enhancement UE in n14 (R4-2114979)**
			- Issue 2-3-1: Pemax definition for SL Enhancement UE
			- Agreements
				* Further check if RAN4 can adopt Option 1 for SL Enh. UE in n14 and if the existing IE*sl-maxTxPower* can be used
			- Issue 2-3-2: REFSENS for n14 SL Enhancement UE
			- Agreements
				* RAN4 need further discussion for REFSENS requirements in n14 whether to follow agreed REFSENS equation or keep the REFSENS from NR Uu for NR SL UE
		+ **System parameters**
			- Issue 1-1-1: synchronization raster
			- Agreements
				* RAN4 keep the current Rel-16 agreements which mean that do not specify the Sync. Raster in both licensed band and unlicensed band for SL operation.
		+ **Updated TR38.785 v0.3.0 was agreed (R4-2112767)**
			- RAN4 captured as following approved TPs
				* TP on PC2 V2X UE coexistence simulation results in section 5.1.1
				* TP on MPR/A-MPR Requirements for PC2 V2X UE in section 5.1.2
				* TP for 38.785: Intra-band con-current V2X operation

Add n79 for intra-band con-current V2X operating band

Add the Priority for Intra-band con-current V2X UE operation

Add MPR requirements for PC3/PC2 intra-band con-current V2X UE

* + - **RAN4 agreed to send LS to FCC for the clarification of emission limits of C-V2X UE in 5895~5925MHz (R4-2115086)**
* Left over issue:
	+ Supporting PC2 NR SL UE RF requirements
		- **Way forward on PC2 NR V2X (R4-2114985)**
			* Issue 1-1: Clarification of PC2 HPUE operating bands
			* Agreements
				+ PC2 is supported for n47 and n79 for Rel-17. For other bands, depends on inputs from operators.
				+ PC1 is supported for n14 in Rel-17.
			* Issue 1-2: NR V2X power class capability
			* Agreements
				+ FFS. How to specify for single carrier V2X UE and/or intra-band con-current V2X UE
			* Issue 3-1-1: co-existence between n38(SL) and n7(Uu)
			* Agreements
				+ No further discussion of co-existence requirements between PC2 n38 and n7 until there are clear requests from operators.
			* Issue 3-3-1: Whether need to continue the study the of co-channel co-existence issues
			* Agreements
				+ FFS, try to close the issue in RAN4#101-e with further clarification.
		- **Way forward on Intra-band V2X con-current operation (R4-2114982)**
			* Topic #1: Operating scenarios for intra-band V2X operation
				+ Issue 1-1-1: Switching time for same carrier and different carrier
				+ Agreements:

To consider switching time separately for cases of same carrier and different carriers.

* + - * + Issue 1-1-3: Switching time position
				+ Agreements:

No impact on RAN1 in case RAN4 decide the switching period position based on the priority rule defined in RAN1.

* + - * + Issue 1-1-5: Time mask for TDM with different carriers
				+ Agreements:

To specify switching time mask between Uu and SL, RAN4 need to wait for RAN1 reply LS and RRM scheduling availability.

* + - * + Issue 1-2-2: Non-adjacent carrier in TDD band
				+ Agreements:

RAN4 do not allow simultaneous UL Tx and SL Rx for non-contiguous and contiguous V2X intra-band con-current operation in Rel-17. SL V2X operation will consider simultaneous Rx/Tx capability after RAN4 study the feasibility of simultaneous Rx/Tx capability for intra-band CA UE of NR Uu.

* + - * + Issue 1-2-3: Whether to consider intra-band V2X con-current operation
				+ Agreements:

Whether to consider intra-band V2X con-current operation for band n14 should be based on operator request.

* + - * + Issue 1-2-4: Intra-band V2X con-current operation in FDD band
				+ Agreements:

More study is needed for con-current SL reception and Uu transmission in FDD band if introduced.

* + - * Topic #2: Synchronous operation between SL and Uu
				+ Issue 2-1-2: SL transmission timing
				+ Agreements:

Wait for RAN1 reply LS to finalize SL transmission timing.

* + - * + Issue 3-2-1: REFSENS
				+ Agreements:

Further discuss REFSENS requirements and check whether the near-far issue should be considered for REFSENS requirements in the next meeting.

**RAN4#100-e: RRM**

RAN4 agreed 1 WF for RRM as follows:

* WF on RRM requirements
	+ Related to new operating scenario (intra-band con-current operation)
		- NTA\_offset when NR Cell is configured as synchronization reference source
			* Postpone until RF decision or RAN1 feedback on whether SL transmit timing is aligned with Uu uplink timing
		- NTA,SL when NR Cell is configured as synchronization reference
			* Postpone until RF decision or RAN1 feedback on whether SL transmit timing is aligned with Uu uplink timing
		- SL Tx Timing error (Te) when NR Cell is configured as synchronization reference source
			* Reuse Rel-16 requirement
		- Scheduling availability requirements when switching TDM based intra-band con-current SL operation
			* Specify the scheduling availability requirements considering RF inputs on the switching time and the reference timing of SL
		- RRM requirements for FDM based intra-band con-current SL operation
			* Study the interruptions on SL due to Uu BWP switch
			* FFS whether to specify interruption requirements on SL due to Uu BWP switch impact on UE transmit timing requirements due to new operating scenario
	+ Related to SL-DRX
		- Initiation/cease of SLSS transmissions due to SL-DRX when GNSS/NR Cell /EUTRAN Cell is synchronization reference source
			* Option 1 : Consider Rel-16 evaluation period requirement as starting point if it does not depend on the progress of SL DRX
			* Option 2 : Consider the progress of SL DRX, e.g., impact of alignment between SL DRX and Uu DRX
		- Initiation/cease of SLSS transmissions due to SL-DRX when SyncRef UE is synchronization reference source
			* Option 1 : Consider Tevaluate,SLSS = max(4 S-SSB periods, 4 SL-DRX cycles) as starting point
				+ For multiple SL-DRX cycles, FFS which one would be applied
				+ Other options based on the assumption of UE behaviour different than one SLSS measurement per SL-DRX cycle are not precluded
			* Option 2 : Consider the progress of SL DRX, e.g., impact of alignment between SL DRX and Uu DRX
		- SyncRef UE detection time of Selection/reselection of V2X Synchronization Reference Source
			* Define the requirements separately for synchronous case and asynchronous case
			* FFS
				+ How to select SL-DRX cycle length for multiple active SL-DRX configurations
				+ Whether to consider measuring SLSS from multiple SLSS periods in a SL-DRX cycle, or measuring only SLSS from one SLSS period per SL-DRX cycle, if SL-DRX cycle length > SLSS period
		- PSBCH-RSRP measurement period of Selection/reselection of V2X Synchronization Reference Source
			* Option 1 : max(320ms, 2 SL-DRX cycles) as starting point
				+ For multiple SL-DRX cycles, FFS which one would be applied
				+ Other options based on the assumption of UE behaviour different than one SLSS measurement per SL-DRX cycle are not precluded
			* Option 2 : FFS whether or not to depend on the progress of SL DRX
		- UE dropping requirements of Selection/reselection of V2X Synchronization Reference Source
			* Selection/reselection of V2X Synchronization Reference Source with SL-DRX
				+ Asynchronous case: UE is allowed to drop V2X reception for the purpose selection/reselection of V2X Synchronization Reference Source
				+ FFS if TX dropping requirement shall be defined and how to take into account SL-DRX
		- Interruption to WAN due to SL-DRX
			* Option 1 : Consider Rel-16 EN-DC interruption requirement as starting point
				+ interruptions can occur due to tuning ON/OFF SL RF

at transitions between active and non-active during SL-DRX

at transitions from non-SL-DRX to SL-DRX

* + - * + Consider to avoid interruptions during certain occasions
			* Option 2 : Consider interruption requirements during LTE ProSe as reference
				+ Consider to avoid interruptions during certain occasions such as while onDurationTimer is running, during paging reception.
		- Interruption to SL due to Uu DRX
			* FFS for specific scenarios for interruption to SL due to Uu DRX
			* Consider Rel-16 EN-DC interruption requirement as starting point

#### 2.4.2 Remaining Open issues

**RF**:

RAN4 will study and specify the above leftover issues and new SL enhancement RF requirements based on operator requested SL operating bands.

* Define operating bands and related RF core requirements for SL enhancement operation
* Define PC2 UE RF requirements in licensed band/unlicensed band
	+ Based on PC2 coexistence evaluation in licensed band, RAN4 can specify PC2 UE RF requirements in licensed band
* For the intra-band con-current operation between NR SL and NR Uu operation in licensed band, RAN4 will specify related RF core requirements to support intra-band contiguous/non-contiguous con-current V2X operation in licensed band.

**RRM**:

RAN4 will study on RRM impacts based on the agreed WF.

* Impact due to new operating scenario
* Impact due to SL-DRX
* Impact due to resource allocation enhancement
* Impact due to Different Service Types

## 2.5 RAN5

#### 2.5.1 Agreements

#### 2.5.2 Remaining Open issues

#### 2.5.3 Remaining Open issues with cross-WG dependencies

## 2.6 RAN6

#### 2.6.1 Agreements

#### 2.6.2 Remaining Open issues

## 3. Detailed progress in SA/CT WGs since last TSG meeting (for all involved WGs)

NOTE: This section only needs to be filled in for WI/SIs where there is a corresponding relevant WI/SI in SA/CT.

## 3.1 SA2

#### 3.1.0 SA2 eV2XARC\_Ph2 status – general

SA2 has progressed normative work on eV2XARC\_Ph2 (Architecture enhancements for 3GPP support of advanced V2X services – Phase 2) to specify support of QoS aware NR PC5 power efficiency for pedestrian UEs in TS 23.287 based on the conclusions defined in clause 7.2 of TR 23.776 and the agreements made for sidelink DRX in RAN2.

The completion level of eV2XARC\_Ph2 is 95%.

#### 3.1.1 Agreements with cross-TSG impacts

The three CRs to TS 23.287 were approved at SA2#146E (16 – 27 August, 2021): S2-2105577, S2-2105578, S2-2106656

#### 3.1.2 Remaining Open issues with cross-TSG impacts

NOTE: This section should also flag any critical dependencies that need TSG attention.

No issue that has critical dependency with RAN2 was identified.

## 3.2 CT WGs

#### 3.2.0 CT WGs eV2XARC\_Ph2 status – general

CT1 has progressed normative work on eV2XARC\_Ph2 (CT aspects of Architecture enhancements for 3GPP support of advanced V2X services – Phase 2) to specify support of PC5 DRX operation in TS 24.587 based on the stage 2 requirements.

## 4. References

NOTE: This can be e.g. a list of all related Tdocs in the affected WGs since last TSG, references to LSs, produced TRs/TSs, the work/study item description or status reports of previous TSGs.

 08.08.2021 minor adaptations for RAN #93e

 17.05.2021 minor adaptations for RAN #92e

 28.01.2021 minor adaptations for RAN #91e

 09.11.2020 minor adaptations for RAN #90e

 31.08.2020 minor adaptations for RAN #89e

 20.04.2020 minor adaptations for RAN #88e

 18.02.2020 minor adaptations for RAN #87e

 14.11.2019 minor adaptations for RAN #86

 18.08.2019 minor adaptations for RAN #85

 12.05.2019 minor adaptations for RAN #84

 27.02.2019 minor adaptations for RAN #83

 21.11.2018 completion levels with colours added (for RAN #82)

v04.81 31.07.2018 simplification of template and addition of cross-TSG aspects (for RAN #81)

v04.80 21.05.2018 minor adaptations for RAN #80

v04.79 26.02.2018 minor adaptations for RAN #79

v04.78 18.11.2017 minor adaptations for RAN #78

v04.77 06.08.2017 minor adaptations for RAN #77

v04.76 15.05.2017 minor adaptations for RAN #76

v04.75 31.01.2017 minor adaptations for RAN #75

v04.74 28.10.2016 minor adaptations for RAN #74

v04.73 01.09.2016 adaptations for RAN #73 (time units in extra Excel table, RAN6 reporting included)

v04.72 26.05.2016 adaptations for RAN #72 (introduction of NR & GERAN TUs)

v04.71 10.02.2016 minor adaptations for RAN #71

v04.70 30.10.2015 minor adaptations for RAN #70

v04.69 12.08.2015 minor adaptations for RAN #69

v04.68 21.05.2015 minor adaptations for RAN #68

v04.67 01.02.2015 minor adaptations for RAN #67

v04.66 16.11.2014 minor adaptations for RAN #66

v04.65 16.08.2014 minor adaptations for RAN #65

v04.64 22.05.2014 minor adaptations for RAN #64

v04.63 24.01.2014 restructuring for RAN #63 to cover Core & Perf. in one doc file

v03.62 11.11.2013 section 1.2.3 adapted for RAN #62

v03 11.08.2013 section 1.2.3 added on time budget

v02 07.05.2010 history added, some spelling corrections

v01 13.11.2009 First version of the template

**RAN1#106-e**

1. R1-2106477 Sidelink resource allocation to reduce power consumption Huawei, HiSilicon
2. R1-2106478 Inter-UE coordination in sidelink resource allocation Huawei, HiSilicon
3. R1-2106531 Resource allocation for power saving Nokia, Nokia Shanghai Bell
4. R1-2106532 Inter-UE coordination for Mode 2 enhancements Nokia, Nokia Shanghai Bell
5. R1-2106570 Inter-UE coordination for enhanced resource allocation Mitsubishi Electric RCE
6. R1-2106620 Resource allocation for sidelink power saving vivo
7. R1-2106621 Discussion on mode-2 enhancements vivo
8. R1-2106622 Other aspects on SL enhancements vivo
9. R1-2106714 Discussion on sidelink resource allocation for power saving Spreadtrum Communications
10. R1-2106715 Discussion on inter-UE coordination in sidelink resource allocation Spreadtrum Communications
11. R1-2106724 Discussion on resource allocation for power saving Zhejiang Lab
12. R1-2106725 Discussion on inter-UE coordination for mode 2 enhancements Zhejiang Lab
13. R1-2106818 Discussion on sidelink resource allocation for power saving Sony
14. R1-2106819 Discussion on inter-UE coordination for Mode 2 enhancements Sony
15. R1-2106909 On Resource Allocation for Power Saving Samsung
16. R1-2106910 On Inter-UE Coordination for Mode2 Enhancements Samsung
17. R1-2106911 Discussion on Sidelink Enhancement Samsung
18. R1-2106942 Discussion on sidelink resource allocation enhancements for power saving CATT, GOHIGH
19. R1-2106943 Discussion on inter-UE coordination in sidelink mode 2 CATT, GOHIGH
20. R1-2106944 Discussion on SL DRX configuration CATT, GOHIGH
21. R1-2107021 Discussion on Sidelink Resource Allocation for Power Saving Panasonic Corporation
22. R1-2107022 NR Sidelink Resource Allocation for UE Power Saving Fraunhofer HHI, Fraunhofer IIS
23. R1-2107023 Resource Allocation Enhancements for Mode 2 Fraunhofer HHI, Fraunhofer IIS
24. R1-2107037 Considerations on partial sensing and DRX in NR Sidelink Fujitsu
25. R1-2107038 Considerations on inter-UE coordination for mode 2 enhancements Fujitsu
26. R1-2107091 Power consumption reduction for sidelink resource allocation FUTUREWEI
27. R1-2107092 Discussion on techniques for inter-UE coordination FUTUREWEI
28. R1-2107151 Discussion on resource allocation for power saving NEC
29. R1-2107152 Discussion on mode 2 enhancements NEC
30. R1-2107163 Sidelink resource allocation for power saving Lenovo, Motorola Mobility
31. R1-2107164 Discussion on inter-UE coordination for Mode 2 enhancements Lenovo, Motorola Mobility
32. R1-2107171 Considerations on partial sensing mechanism of NR V2X CAICT
33. R1-2107172 Considerations on mode 2 enhancements CAICT
34. R1-2107195 Discussion on resource allocation for power saving Hyundai Motors
35. R1-2107196 Discussion on inter-UE coordination for Mode 2 enhancements Hyundai Motors
36. R1-2107223 Discussion on power saving in NR sidelink communication OPPO
37. R1-2107224 Inter-UE coordination in mode 2 of NR sidelink OPPO
38. R1-2107225 Wake up signal for NR sidelink OPPO
39. R1-2107303 Inter-UE coordination for Mode 2 enhancements Panasonic Corporation
40. R1-2107367 Power Savings for Sidelink Qualcomm Incorporated
41. R1-2107368 Reliability and Latency Enhancements for Mode 2 Qualcomm Incorporated
42. R1-2107422 Discussion on resource allocation for power saving CMCC
43. R1-2107423 Discussion on inter-UE coordination for mode 2 enhancement CMCC
44. R1-2107481 Discussion on resource allocation for power saving ETRI
45. R1-2107482 Discussion on inter-UE coordination for Mode 2 enhancements ETRI
46. R1-2107498 Discussion on sidelink power saving MediaTek Inc.
47. R1-2107522 Discussion on Mode 2 enhancements MediaTek Inc.
48. R1-2107528 Discussion on resource allocation for power saving LG Electronics
49. R1-2107529 Discussion on inter-UE coordination for Mode 2 enhancements LG Electronics
50. R1-2107609 Sidelink Resource Allocation Schemes for UE Power Saving Intel Corporation
51. R1-2107610 Design of Inter-UE Coordination Solutions for Sidelink Communication Intel Corporation
52. R1-2107621 Inter-UE Coordination for Mode 2 Enhancements Kyocera
53. R1-2107760 Sidelink Resource Allocation for Power Saving Apple
54. R1-2107761 Discussion on Inter-UE Coordination Apple
55. R1-2107762 Network Assisted Resource Selection Apple
56. R1-2107782 Discussion on inter-UE coordination ZTE
57. R1-2107804 Discussion on resource allocation for power saving Sharp
58. R1-2107805 Discussion on inter-UE coordination for mode 2 enhancements Sharp
59. R1-2107879 Discussion on sidelink resource allocation for power saving NTT DOCOMO, INC.
60. R1-2107880 Resource allocation for reliability and latency enhancements NTT DOCOMO, INC.
61. R1-2107899 Discussion on sidelink resource allocation enhancement for power saving Xiaomi
62. R1-2107900 Discussion on inter-UE coordination Xiaomi
63. R1-2107901 Discussion on other design aspects for sidelink enhancement Xiaomi
64. R1-2107994 Inter-UE coordination for mode 2 enhancements ITL
65. R1-2108023 Resource Allocation for Power Saving in NR SL Convida Wireless
66. R1-2108024 Inter-UE Coordination for NR SL Mode 2 Enhancements Convida Wireless
67. R1-2108035 Sidelink resource allocation for power saving InterDigital, Inc.
68. R1-2108036 On inter-UE coordination for Mode 2 enhancement InterDigital, Inc.
69. R1-2108037 On gNB-designated resources for inter-UE coordination InterDigital, Inc.
70. R1-2108085 Discussion on resource allocation for power saving ZTE, Sanechips
71. R1-2108086 BWP configuration for power saving ZTE, Sanechips
72. R1-2108096 Discussion on partial sensing and SL DRX impact ASUSTeK
73. R1-2108097 Discussion on V2X mode 2 enhancements ASUSTeK
74. R1-2108115 Feasibility and benefits for NR Sidelink mode 2 enhancements CEWiT
75. R1-2108121 Resource allocation for power saving in NR sidelink enhancement ITL
76. R1-2108136 Resource allocation procedures for power saving Ericsson
77. R1-2108137 Feasibility and benefits of mode 2 enhancements for inter-UE coordination Ericsson
78. R1-2108138 Additional enhancements to resource allocation procedures Ericsson
79. R1-2108184 Physical layer impacts of sidelink DRX Huawei, HiSilicon
80. R1-2108210 Discussion on mode-2 enhancements vivo
81. R1-2108238 Discussion on sidelink resource allocation enhancements for power saving CATT, GOHIGH
82. R1-2108262 FL summary for AI 8.11.1.1 – resource allocation for power saving (before 1st check point) Moderator (OPPO)
83. R1-2108263 FL summary for AI 8.11.1.1 – resource allocation for power saving (before 2nd check point) Moderator (OPPO)
84. R1-2108264 FL summary for AI 8.11.1.1 – resource allocation for power saving (before 3rd check point) Moderator (OPPO)
85. R1-2108265 FL summary for AI 8.11.1.1 – resource allocation for power saving (EOM) Moderator (OPPO)
86. R1-2108266 Moderator summary for [106-e-NR-R17-Sidelink-02] Reply LS to R1-2106413 Moderator (OPPO)
87. R1-2108272 Reliability and Latency Enhancements for Mode 2 Qualcomm Incorporated
88. R1-2108340 Reliability and Latency Enhancements for Mode 2 Qualcomm Incorporated
89. R1-2108569 Feature lead summary for AI 8.11.1.2 Inter-UE coordination for Mode 2 enhancements Moderator (LG Electronics)
90. R1-2108572 Summary for email discussion [106-e-NR-R17-Sidelink-05] Moderator (CATT)
91. R1-2108580 Reply LS on SL DRX design RAN1, ZTE
92. R1-2108621 Draft reply LS on time gap information in SCI Moderator (OPPO)
93. R1-2108622 Reply LS on time gap information in SCI RAN1, OPPO
94. R1-2108627 Reliability and Latency Enhancements for Mode 2 Qualcomm Incorporated
95. R1-2108653 Summary of [106-e-NR-R17-Sidelink-03] email discussion to reply LS in R1-2100021 Moderator (ZTE)

**RAN2#115-e**

1. R2-2106985 Leftover Issues for Sidelink Unicast DRX CATT
2. R2-2106986 Leftover Issues for Sidelink Groupcast and Broadcast DRX CATT
3. R2-2106987 Further Issues Regarding to the Tx Profile CATT
4. R2-2106988 Impacts of SL DRX on Other Procedures CATT
5. R2-2107041 Discussion on left issue from [704][705][706] OPPO
6. R2-2107042 Discussion on resource allocation enhancement OPPO
7. R2-2107151 NR SL DRX Fraunhofer IIS, Fraunhofer HHI
8. R2-2107155 Consideration on sidelink DRX for groupcast and broadcast Huawei, HiSilicon
9. R2-2107156 Remaining issues on the sidelink DRX for unicast Huawei, HiSilicon
10. R2-2107157 Discussion on SL communication impact on Uu DRX Huawei, HiSilicon
11. R2-2107158 Consideration on resource allocation enhancements Huawei, HiSilicon
12. R2-2107159 Summary of [POST114-e][705][V2XSL] Discussion on remaining FFSs and open issues in Uu DRX timer Huawei, HiSilicon
13. R2-2107181 Power Reduction for Sidelink Mode 2 Resource Allocation Fraunhofer IIS, Fraunhofer HHI
14. R2-2107182 Inter-UE Coordination for Sidelink Mode 2 Resource Allocation Fraunhofer IIS, Fraunhofer HHI
15. R2-2107190 Left issues on SL-DRX OPPO
16. R2-2107191 Discussion on SL-DRX impact to mode-1 scheduling OPPO
17. R2-2107238 Leftover issues on overall flow of unicast TX-UE centric mechanism NEC Corporation
18. R2-2107239 Discussion on DRX suspend/resume mechanism NEC Corporation
19. R2-2107240 Discussion on inter-UE coordination for sidelink mode 2 resource allocation NEC Corporation
20. R2-2107242 Further discussion on Uu/SL DRX timer LG Electronics France
21. R2-2107268 Summary of [POST114-e][706][V2X/SL] Discussion on remaining FFSs/open issues in SL DRX timer maintenance (InterDigital) InterDigital
22. R2-2107269 Resource Allocation Considering DRX InterDigital
23. R2-2107270 Open Issues on SL DRX Timers InterDigital
24. R2-2107271 DRX Configuration Determination in Unicast InterDigital
25. R2-2107272 RAN2 Aspects of Inter-UE Coordination InterDigital
26. R2-2107303 Summary of [POST114-e][704][V2X/SL] How to make sure Rel-16 UEs not supporting SL DRX are not involved in SL communication in DRX manner (Sharp) SHARP Corporation
27. R2-2107310 On SL DRX Configuration aspects Intel Corporation
28. R2-2107311 Discussion on SL DRX Timers Intel Corporation
29. R2-2107312 On DRX wake-up time alignment Intel Corporation
30. R2-2107355 Remaining issues on DRX Timers for SL Unicast Spreadtrum Communications
31. R2-2107368 Discussion on resource allocation enhancement for NR sidelink Spreadtrum Communications
32. R2-2107432 Consideration on Backward compatibility for SL DRX ZTE Corporation, Sanechips
33. R2-2107433 Further consideration on DRX configuration ZTE Corporation, Sanechips
34. R2-2107434 Discussion on SL DRX timer ZTE Corporation, Sanechips
35. R2-2107435 Discussion on inter-UE coordination ZTE Corporation, Sanechips
36. R2-2107472 Remaining aspects of SL DRX Ericsson
37. R2-2107473 Interaction between partial sensing and DRX Ericsson
38. R2-2107474 Handling coexistence between UEs supporting different releases Ericsson
39. R2-2107626 Discussion on remaining issues of SL DRX configurations Apple
40. R2-2107627 Discussion on remaining issues of SL impact of Uu-DRX Apple
41. R2-2107628 Discussion on Inter-UE Coordination Apple
42. R2-2107629 NR SL Resource allocations for Pedestrian UEs Apple
43. R2-2107653 Remaining details on HARQ RTT and Retransmission Timer for SL DRX Fujitsu
44. R2-2107654 SL DRX impact on LCP Fujitsu
45. R2-2107917 Discussion on backward compatible issue of SL DRX Lenovo, Motorola Mobility
46. R2-2107918 Discussion on sidelink resource allocation enhancements Lenovo, Motorola Mobility
47. R2-2107968 DRX impact on Uu Xiaomi communications
48. R2-2107969 Discussion on Sidelink DRX for unicast Xiaomi communications
49. R2-2107970 Discussion on Sidelink DRX for broadcast and groupcast Xiaomi communications
50. R2-2107971 Resource allocation enhancement impact in RAN2 Xiaomi communications
51. R2-2108014 DRX Configuration for UC BC GC and its interaction with Sensing Lenovo Mobile Com. Technology
52. R2-2108016 DRX coordination between Uu and SL Lenovo Mobile Com. Technology
53. R2-2108072 Proposals for Sidelink DRX Sony
54. R2-2108073 Discusison on Sidelink sensing Sony
55. R2-2108118 Power efficient resource allocation and Inter-UE coordination LG Electronics France
56. R2-2108151 Consideration on TX centric SL DRX configuration and alignment LG Electronics Inc.
57. R2-2108191 General principles for resource allocation enhancements for SL mode 2 Ericsson
58. R2-2108214 Discussion on Compatible Issues with Rel 16 UEs Qualcomm Finland RFFE Oy
59. R2-2108215 Discussion on RLF and PC5 RRC Connection with SL DRX Qualcomm Finland RFFE Oy
60. R2-2108217 Discussion on Remaining Issues Qualcomm Finland RFFE Oy
61. R2-2108222 A Default PC5 DRX Configuration for Broadcast/Groupcast/Unicast vivo
62. R2-2108223 DRX duration calculation vivo, Xiaomi, ZTE corporation
63. R2-2108224 Remaining issues on SL DRX for unicast/groupcast/broadcast vivo
64. R2-2108225 Discussion on inter-UE coordination for sidelink mode2 vivo
65. R2-2108295 Resource Allocation Enhancements for Reduced Power Consumption and Enhanced Reliability Intel Corporation
66. R2-2108426 Discussion on TBD/FFS Samsung Research America
67. R2-2108427 Further consideration for SL DRX operation in groupcast Samsung Research America
68. R2-2108428 Further consideration for SL DRX and Uu DRX alignments Samsung Research America
69. R2-2108429 Initial discussion on enhanced resource allocation Samsung Research America
70. R2-2108469 Discussion on alignment of mode 1 RA of Tx UE and SL DRX of Rx UE Nokia, Nokia Shanghai Bell
71. R2-2108470 Further Issues on Sidelink Traffic Pattern for SL DRX Configuration Nokia, Nokia Shanghai Bell
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2. R4-2111942 On coexistence evaluation necessity in band n14 CATT
3. R4-2111943 TP on intra-band V2X operation CATT
4. R4-2111944 On V2X intra-band con-current operation CATT
5. R4-2111945 On time mask for Uu and SL switching CATT
6. R4-2111946 On HPUE for NR SL enhancement CATT
7. R4-2112341 TP on MPR for NR V2X intra-band con-current operation with Uu LG Electronics
8. R4-2112608 on HPUE signalling issue Xiaomi
9. R4-2112611 on PEMAX issue Xiaomi
10. R4-2112612 draft LS out\_PC2 V2X intra-band concurrent Xiaomi
11. R4-2112678 TP for TR 38.785 on MPR and AMPR for NR V2X PC2 LG Electronics Inc.
12. R4-2112767 TR38.785 v0.3.0 TR Update for SL enhancement in Rel-17 LG Electronics France
13. R4-2112769 RF requirements for intra-band con-current V2X operation with NR PC5 and NR Uu in a licensed band LG Electronics France
14. R4-2112840 Consideration on NR PS and LTE PS different point for n14 SL enhancement coexistence study perspective LG Electronics France
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24. R4-2114338 FDM operation for partially used SL operation in licensed band Ericsson
25. R4-2114505 Further consideration on SL timing alignment Huawei, HiSilicon
26. R4-2114506 On TDM operation for NR SL Huawei, HiSilicon
27. R4-2114507 On specific HPUE power class capability for NR V2X Huawei, HiSilicon
28. R4-2114508 draft LS on new power class 2 capability for NR-V2X Huawei, HiSilicon
29. R4-2114509 Further consideration on co-existence study for n38 (SL) and adjacent band n7 (Uu) Huawei, HiSilicon
30. R4-2114589 MPR specifications for V2X intra-band con-current operation Qualcomm Incorporated
31. R4-2114698 Further discussion on FDM intra-band concurrent operation Xiaomi
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33. R4-2114977 WF on FCC regulation requirements for 5G V2X service Huawei
34. R4-2114978 WF on n14 coexistence evaluation for NR PS UE Ericsson
35. R4-2114979 WF on Pemax definition and NR PS REFSENS in licensed band LG Electronics
36. R4-2114980 TP on sync raster for SL licensed bands CATT
37. R4-2114981 TP on updating REFSENS requirements for NR SL enhancement LG Electronics France
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41. R4-2114985 Way forward on PC2 NR V2X Huawei, HiSilicon
42. R4-2115034 Email discussion summary for [100-e][134] NRSL\_enh\_Part\_1 Moderator (LGE)
43. R4-2115035 Email discussion summary for [100-e][135] NRSL\_enh\_Part\_2 Moderator (CATT)
44. R4-2115036 Email discussion summary for [100-e][136] NRSL\_enh\_Part\_3 Moderator (Huawei)
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46. R4-2111960 Further considerations on RRM requirements for Sidelink enhancement CATT
47. R4-2112260 On NR SL RRM Requirement Scope Qualcomm, Inc.
48. R4-2112338 RRM requirements for NR SL enhancement LG Electronics
49. R4-2112418 Discussion on RRM requirements for NR sidelink enhancement Xiaomi
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52. R4-2113821 Discussion on RRM impacts for R17 NR V2X enhancement Huawei, HiSilicon
53. R4-2114082 Discussions on Sidelink RRM requirements Ericsson
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