**3GPP TSG RAN WG1 Meeting #110 R1-220xxxx**

**Toulouse, France, August 22nd – 26th, 2022**

**Agenda item:** 8.11

**Source:** Moderator (OPPO)

**Title:** Initial summary for R17 eSL power saving RA maintenance

**Document for:** Discussion and decision

## Introduction

Maintenance issues submitted in contributions [1-16] to RAN1#110 meeting are summarized Sections 2 for R17 eSL power saving. An initial assessment on each of the maintenance issues is provided based on the following classification:

* ***High priority (H)****:*
  + *High-priority item (essential, pending issues, broken spec components) and proposed editorial changes that either enhance the clarity of the specs or correct mistakes*
* ***Non-essential (N)****:*
  + *All other purposes such as spec optimization and low priority issues*
* ***Editorial (E)****:*
  + *Editorial issues that will be handled as editorial CRs (to be communicated to the editors/chairs)*

## Preparation for maintenance

## Collection of issues for agenda item “Resource allocation for power saving”

**Table 1 - Resource allocation for power saving**

|  |  |  |  |
| --- | --- | --- | --- |
| **Issue#** | **Issue** | **References** | **FL initial assessment** |
| 1 | Update of Q formula in Step 6 for the 2nd most recent PSO   * Per the latest FL Proposal 1-1 (V) from RAN1#109-e [1, 2, 3, 8] * No change to the current spec [5] * Per the original Option 2 with 4 cases from RAN1#108-e [11] | [1] (2.1.1)  [2] (5)  [3] (2.6)  [5] (2.1)  [8] (2.1)  [11] (2.1.2) | H |
| 2 | UE reports a full initialized candidate resource set (*SA*) when performing random resource selection (only Step 1-4) | [1] (2.1.2) | N |
| 3 | Random resource selection in a resource pool configured with mixed RA types | [1] (2.1.3) | N |
| 4 | When *partialSensingInactiveTime* is enabled, UE monitors only the default periodic sensing occasions (most recent sensing occasion earlier than ) from the slots; | [2] (6.2) | N |
| 5 | Conditions in which the UE performs CPS   * … the UE performs contiguous partial sensing, unless other conditions state otherwise in the specification. [3, 8, 10, 12] * No change to the current spec description in 38.214 [4] | [3] (2.1)  [4] (2.1)  [8] (P4)  [10] (P1, p2)  [12] (TP#1) | H |
| 6 | Selection of Y or Y’ candidate slots should be based on periodic or aperiodic Tx | [3] (2.2)  [4] (2.3)  [8] (P2, P3)  [12] (TP#1) | H |
| 7 | Confirming or reverting the WA on the lower bound of *M* value for CPS window in aperiodic traffic | [3] (2.3)  [4] (2.2) | N |
| 8 | Definition of slot in re-evaluation and pre-emption checking should be corrected as “ is the first candidate slot from slot *n+T3*.” | [3] (2.4)  [12] (TP#3) | H |
| 9 | Pre-conditions for re-evaluation and pre-emption checking | [3] (2.5) | N |
| 10 | Corrections on CPS sensing window:   * To clearly distinguish UE behavior for CPS in the two cases of and * Use to indicate the first slot of the selected *Y’* candidate slots * Remove the sentence “~~When the minimum M slots for CPS cannot be guaranteed and when P\_"rsvp\_TX" =0, it is up to UE implementation to either continue with step 3) or perform random selection~~” in case of periodic transmission | [3] (2.7)  [4] (2.3)  [6] (TP#1, #2)  [8] (P5)  [12] (TP#1) | H |
| 11 | **Proposal 2**: Within inactive time period of Rx UE, Rx UE can only detect the SCI on reserved resource for potential (re-)transmission.  **Proposal 3**: Support SL Tx/Rx performed in a power saving manner by configuring a resource pool partition for resource alignment among multiple UEs.   * A resource pool partition is configured by a set of disjoint resource patterns. * Each resource pattern can be configured with features about controlling selection opportunities for different type of services and thus facilitating resource avoidance. * For a resource pool selected for use, a UE can further (re-)select resource pattern(s) based on sensing results. * Resource alignment can be performed by indicating identity of resource pattern among UEs. | [5] (2.2) | N |
| 12 | Use *M’* instead of *M* for the minimum CPS window when | [6] (TP#1) | N |
| 13 | Use *k’* to indicate the instance of periodic sensing occasions in PBPS, where *k*’=1 if *sl-Additional-PBPS-Occasion* is not (pre-)configured and *k*’=2 if *sl-Additional-PBPS-Occasion* is (pre-)configured | [6] (TP#3) | N |
| 14 | Whether full sensing UE can be configured with SL DRX   * A UE configured with SL DRX for power saving for its own reception is not expected to use full sensing [6] * A full sensing UE performs PSCCH reception and RSRP measurement during SL DRX inactive time is enabled/disabled by “*partialSensingInactiveTime*”, same as partial sensing. [11] | [6] (3)  [11] (P3, P4) | N |
| 15 | Timing for reporting candidate resource set (*SA*) to higher layers is in slot when UE performs partial sensing. | [7] (TP#3) | N |
| 16 | When MAC layers provide resources for re-evaluation and pre-emption checking, the “*qth*” reservation period should be indicated to the PHY layer, i.e. the resources are within the *qth* reservation period as:   * If , the set of resources and the set of resources are in the *q*th reservation period (*q*=0,1,2,…, Cresel-1). | [9] (TP#1) | N |
| 17 | * Skip PBPS in slot during pre-emption checking due to the half-duplex issue where a prior SCI in slot was used to reserve the resource in slot . * When performing PBPS and/or CPS in re-evaluation and pre-emption checking, clarify that the sensing slots does not include slots in which the UE’s own transmission occur. | [9] (TP#2)  [12] (TP#5) | H |
| 18 | Determination of *Preserve*   * In *sl-ResourceReservePeriodList*, the value ms0 is always configured. So, the values of *Preserve* should correspond to all the non-zero periodicity from *sl-ResourceReservePeriodList.* | [9] (TP#4) | N |
| 19 | Clarification on in PBPS for aperiodic transmission:   * When the UE performs periodic-based partial sensing, the UE shall monitor slots at , where is a slot of the selected candidate slots except for the other candidate slots when is smaller than and … | [9] (TP#5) | N |
| 20 | When UE is required/enabled to perform SL reception of PSCCH and RSRP measurement on slots in SL DRX inactive time, the UE should monitor only ) logical slots for CPS instead of M. | [11] (P1, P2) | H |
| 21 | Clarify the steps to identify *SA* in re-evaluation and pre-emption checking for partial sensing. | [12] (TP#4) | N |
| 22 | Insufficient candidate resources during re-evaluation and pre-emption checking  - e.g., If the number of candidate single-slot resources is smaller than , it is up to UE implementation to include other candidate slots. | [12] (TP#6) | N |
| 23 | Update of spec description on the combination of RA scheme(s) allowed in a resource pool | [13] | N |
| 24 | Adding a description to the definition of *sl-ResourceReservedPeriodList* as:   * *sl-ResourceReservePeriodList* is the configured set of possible resource reservation periods allowed in the resource pool. | [13] | N |
| 25 | In the case of CPS-only for aperiodic Tx, clarify that the selected *Y’* candidate slots do not overlap with the CPS sensing window | [13] | N |
| 26 | Adding “…within the sidelink DRX active time of the RX UE in the set ” in Step 7a) | [13] | N |
| 27 | In re-evaluation and pre-emption checking, clarify that “UE performs CPS starting from at least *M* consecutive logical slots earlier than to slots earlier than taking into consideration associated processing times.” | [13] | N |
| 28 | * If not (pre-)configured, the UE monitors the most recent sensing occasion before the first slot of the candidate slots for the given periodicity used to determine periodic sensing occasions in periodic-based partial sensing. * When the resource pool is (pre-)configured with *allowedResourceSelectionConfig* including full sensing, and full sensing is ~~(pre-)~~configured in the UE by higher layers, the UE performs full sensing. * The value of corresponds to *sl-PBPS-OccasionReservePeriodList* if pre-configured, otherwise, the values correspond to all periodicity from *sl-ResourceReservePeriodList.* | [2] (6.1) | E |
| 29 | RRC parameter name alignment:  - *sl-~~a~~AllowedResourceSelectionConfig*  - *sl-~~m~~MinNumCandidateSlotsPeriodic*  - *sl-~~m~~MinNumCandidateSlotsAperiodic*  - *sl-~~p~~PartialSensingInactiveTime* | [12] (TP#7) | E |
| 30 | - Optionally, minimum number of *Y* slots as *Y*\_min (*minNumCandidateSlotsPeriodic*), which indicates the minimum number of *Y* slots that are included in the candidate resources corresponding to periodic-based partial sensing operation.  - Optionally, minimum number of slots as (*minNumCandidateSlotsAperiodic*), which indicates the minimum number of slots that are included in the candidate resources corresponding to contiguous partial sensing operation. | [13] | E |

## Summary of company views on the maintenance issues to be treated

|  |  |  |
| --- | --- | --- |
| **Issue#** | **FL initial assessment** | **Companies’ inputs** |
| 1 | H | High priority or OK:  Non-essential:  Editorial: |
| 2 | N | High priority or OK:  Non-essential:  Editorial: |
| 3 | N | High priority or OK:  Non-essential:  Editorial: |
| 4 | N | High priority or OK:  Non-essential:  Editorial: |
| 5 | H | High priority or OK:  Non-essential:  Editorial: |
| 6 | H | High priority or OK:  Non-essential:  Editorial: |
| 7 | N | High priority or OK:  Non-essential:  Editorial: |
| 8 | H | High priority or OK:  Non-essential:  Editorial: |
| 9 | N | High priority or OK:  Non-essential:  Editorial: |
| 10 | H | High priority or OK:  Non-essential:  Editorial: |
| 11 | N | High priority or OK:  Non-essential:  Editorial: |
| 12 | N | High priority or OK:  Non-essential:  Editorial: |
| 13 | N | High priority or OK:  Non-essential:  Editorial: |
| 14 | N | High priority or OK:  Non-essential:  Editorial: |
| 15 | N | High priority or OK:  Non-essential:  Editorial: |
| 16 | N | High priority or OK:  Non-essential:  Editorial: |
| 17 | H | High priority or OK:  Non-essential:  Editorial: |
| 18 | N | High priority or OK:  Non-essential:  Editorial: |
| 19 | N | High priority or OK:  Non-essential:  Editorial: |
| 20 | H | High priority or OK:  Non-essential:  Editorial: |
| 21 | N | High priority or OK:  Non-essential:  Editorial: |
| 22 | N | High priority or OK:  Non-essential:  Editorial: |
| 23 | N | High priority or OK:  Non-essential:  Editorial: |
| 24 | N | High priority or OK:  Non-essential:  Editorial: |
| 25 | N | High priority or OK:  Non-essential:  Editorial: |
| 26 | N | High priority or OK:  Non-essential:  Editorial: |
| 27 | N | High priority or OK:  Non-essential:  Editorial: |
| 28 | E | High priority or OK:  Non-essential:  Editorial: |
| 29 | E | High priority or OK:  Non-essential:  Editorial: |
| 30 | E | High priority or OK:  Non-essential:  Editorial: |

**FL recommendation**:

R17 eSL maintenance issues for “Resource allocation for power saving” to be addressed in RAN1#110 meeting:

* TBD

## Online decision

TBD

## Discussion

## Issue #

TBD

## Reference

1. [R1-2205766](https://www.3gpp.org/ftp/tsg_ran/WG1_RL1/TSGR1_110/Docs/R1-2205766.zip) Remaining issues on maintenance of Rel-17 sidelink enhancements Huawei, HiSilicon
2. [R1-2206096](https://www.3gpp.org/ftp/tsg_ran/WG1_RL1/TSGR1_110/Docs/R1-2206096.zip) Maintenance on NR SL enhancement ZTE, Sanechips
3. [R1-2206283](https://www.3gpp.org/ftp/tsg_ran/WG1_RL1/TSGR1_110/Docs/R1-2206283.zip) Remaining essential issues in R17 NR sidelink enhancement OPPO
4. [R1-2206360](https://www.3gpp.org/ftp/tsg_ran/WG1_RL1/TSGR1_110/Docs/R1-2206360.zip) Maintenance on NR sidelink enhancement CATT, GOHIGH
5. [R1-2206447](https://www.3gpp.org/ftp/tsg_ran/WG1_RL1/TSGR1_110/Docs/R1-2206447.zip) Remaining issues on resource allocation for sidelink enhancement Lenovo
6. [R1-2206763](https://www.3gpp.org/ftp/tsg_ran/WG1_RL1/TSGR1_110/Docs/R1-2206763.zip) Maintenance on NR Sidelink enhancement vivo
7. [R1-2206804](https://www.3gpp.org/ftp/tsg_ran/WG1_RL1/TSGR1_110/Docs/R1-2206804.zip) Maintenance on NR sidelink enhancement Samsung
8. [R1-2206890](https://www.3gpp.org/ftp/tsg_ran/WG1_RL1/TSGR1_110/Docs/R1-2206890.zip) Maintenance on NR Sidelink enhancement CMCC
9. [R1-2206936](https://www.3gpp.org/ftp/tsg_ran/WG1_RL1/TSGR1_110/Docs/R1-2206936.zip) Remaining issues on NR sidelink enhancement Sharp
10. [R1-2207146](https://www.3gpp.org/ftp/tsg_ran/WG1_RL1/TSGR1_110/Docs/R1-2207146.zip) Remaining issues on R17 SL Enhancement InterDigital, Inc.
11. [R1-2207313](https://www.3gpp.org/ftp/tsg_ran/WG1_RL1/TSGR1_110/Docs/R1-2207313.zip) On Maintenance of NR Sidelink Enhancement Apple
12. [R1-2207386](https://www.3gpp.org/ftp/tsg_ran/WG1_RL1/TSGR1_110/Docs/R1-2207386.zip) Maintenance of sidelink enhancement NTT DOCOMO, INC.
13. [R1-2207563](https://www.3gpp.org/ftp/tsg_ran/WG1_RL1/TSGR1_110/Docs/R1-2207563.zip) Critical corrections and remaining issues on NR SL enhancement Ericsson