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RP-161710

Proposal for scope revision of the WI on LTE V2X

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General

- For WI “LTE-based V2X services” (approved at RAN#72 in [1]):
  - This work item should incorporate the important aspects that were not completed in V2V WI.
  - This work item should take into account the agreements made in V2V WI.

V2V Leftovers

Proposal:

The following leftovers of V2V WI should be addressed in V2X WI:

- Congestion control mechanisms
  - To guarantee end-to-end performance by reporting to APP layer for message generation rate adjustment, by adjusting UE transmission behaviours, and/or by reporting to network to adapt transmission parameters
- PC5/Uu path configuration
  - Specify a mechanism to enable E-UTRAN to configure PC5 and/or Uu for transport of V2V messages within network coverage by e.g. taking PC5/Uu load into account
- Enhancement on inter-carrier scheduling and resource configuration for PC5
- PC5 reception over multiple carriers
- SPS on PC5 interface
- SLSS based synchronization
- Possibly others (e.g., data/control in different subframes)

Co-existence between DSRC/IEEE 802.11p and LTE PC5 for V2V

- **The current objective in V2X WI:**
  - *To specify solution(s) facilitating long-term basis co-channel coexistence between DSRC/IEEE 802.11p and LTE PC5 for V2V operating over the same frequency channels [RAN1]*
    - *This objective starts from RAN#73 and target is to complete this by RAN#74. Solution(s) to be specified should avoid negative impact on the performance of LTE PC5.*

- **Proposal:**
  - To specify a solution to enable efficient detection of PC5-based V2V by DSRC/IEEE 802.11p to facilitate the coexistence.
  - If both technologies will coexist in the same geographical location, it is up to regional regulation organizations to define the exact coexistence mechanism (e.g. how to vacate and when to return) which should be followed by both technologies.

Support of up to 40Hz Message Frequency

Background:

- According to the agreement made in RAN1#86, the resource reservation period (i.e., corresponding to the traffic period) is signalled in SCI using a 4-bit field, but the values of the period are multiples of 100ms, i.e. from 100ms to1000ms which can only support up to 10Hz message frequency.
- The following was agreed in the SA1 Rel-15 eV2X Study Item for Set 1 Platooning performance requirements [2]:
  - Considering the round-trip-time and processing delay, message transmission frequency up to 40Hz, translating into 25ms radio latency with message sizes of around 300-400 bytes should be supported.

Problem:

- To support Rel-15 platooning, it is straightforward to indicate 25ms resource reservation period in SCI in Rel-15. However, this will cause backward compatibility issues, i.e. Rel-14 UEs cannot recognize this new value in SCI transmitted by Rel-15 UEs.

Proposal:

- Support up to 40Hz message frequency (i.e., 25ms traffic periodicity) in Rel-14 V2X WI

References

- **[1] RP-161298, LTE-based V2X Services**
- **[2] S1-162233, TR 22.886, V0.2.0, Study on enhancement of 3GPP Support for 5G V2X Services (Release 15)**