Qualcomm

3GPP TSG RAN meeting #93e
Electronic meeting, Sept. 13-17, 2021
A.I. 9.0.3

RP-212081

Views on Sidelink Relay Enhancements for Rel-18

Background

- Pre-plenary email discussion “[RAN93e-R18Prep-06] Sidelink enhancements (excluding positioning)” concluded on the general aspect that **SL relay enhancements and SL enhancements are handled through separate work items**
- Below is the moderator summary from the final round of Sidelink relay enhancements
- **First candidate topics (non-controversial)**
  - “UE-to-UE relay”
    - − Limit the scope to the single hop operation while taking into account the forward compatibility for supporting more than one hop in a later release.
    - − Discuss whether Layer-2 and/or Layer-3 relay need to be considered. Discuss whether to limit the scope to unicast
    - − Leading WG: RAN2, Secondary WG: TBD − SA/CT impact is expected
  - “Service continuity enhancements”
    - − The target scenarios are inter-gNB mobility and indirect-to-indirect path switching.
    - ○ Continue discussion on whether the indirect-to-indirect path switching will include the inter-gNB mobility case.
    - − Leading WG: RAN2, Secondary WG: RAN3 − SA/CT impact is expected
- **Candidate topic (controversial): “Multi-path relay”**
  - Limit the scope to the combination of one direct path and one indirect path while taking into account the forward compatibility for supporting other scenarios in a later release.
  - Discuss further whether the scenario will include the case where a UE is connected via the indirect path to a cell different from its serving cell of the direct path

Qualcomm's view on the **Candidate topic**

- "Multi-path Relay" is an important topic that should be included in Rel-18 package
  - This is important for multiple use cases in different market segments, including eMBB and IoT;
  - It greatly improves reliability and service continuity, and offer possible throughput enhancements;
  - This is also relevant to the "UE aggregation" use cases.

- Depending on the Rel-18 workload, the scope can be considered:
  - Start with combination of one direct path and one indirect path while considering the forward compatibility for supporting other scenarios in a later release.
  - Support the use case a UE is connected via the indirect path to a cell different from its serving cell of the direct path is important.

Qualcomm's view on potential topics

- Some of the topics, e.g."Redcap with SL relay" and "multi-hop for relays", are not included in the final round moderator summary due to limited support from other companies
- We think that the left-over topics need further discussion considering the market needs and the work impact, before ruling them out from Rel-18 work scope.
- **Justification to include in Rel-18 package:** Allows 3GPP to address broader market needs like massive IOT (mIoT), IIOT and Public safety.
  - **Redcap with SL relay** - In mIOT use cases, the UEs are typically Redcap devices and use other UEs as relay for further coverage extension.
  - **Multi-hop for U2N and U2U relays** - mIOT devices with limited power, and , public safety devices that are OOC may need multiple hops to reach the network. Support of multi-hop U2N relay requires the support for multi-hop U2U relay
- **Technical work impact may be limited:**
  - RedCap sidelink can be easily supported without PHY changes; -- see discussion in RedCap thread.
  - Supporting RedCap UE connected via SL Relay to network only requires minor enhancements to the Rel-17 Relay framework:
    - Minor extension to the Relay discovery messages;
    - Minor extension to the signaling messages for capability indications;
    - Minor extension to access control, and power saving mechanism;
    - The rest of the relay procedures can be reused.
  - Multi-hop design for U2U relay can be leveraged for U2N relay.

Proposals

- **Proposal 1:** Consider the first candidate topics (non-controversial), from the final round moderator summary of "[RAN93e-R18Prep-06], in the SL relay enhancements work scope with below clarifications:
  - Consider both Layer-2 and Layer-3 UE-to-UE Relay; and
  - Only unicast traffic relaying for UE-to-UE relay
- **Proposal 2:** Consider the second candidate topics (controversial), "Multi-path Relay", in the SL relay enhancements work scope
- **Proposal 3:** Consider the below topics in the Rel-18 SL Relay enhancements work scope discussion to discuss further the market needs and the work impact:
  - Redcap with SL relay
  - Multi-hop for U2U and U2N relay

Qualcomm

Thank you

Follow us on:

For more information, visit us at:

www.qualcomm.com & www.qualcomm.com/blog

Nothing in these materials is an offer to sell any of the components or devices referenced herein.

©2018 Qualcomm Technologies, Inc. and/or its affiliated companies. All Rights Reserved.

Qualcomm is a trademark of Qualcomm Incorporated, registered in the United States and other countries. Other products and brand names may be trademarks or registered trademarks of their respective owners.

References in this presentation to “Qualcomm” may mean Qualcomm Incorporated, Qualcomm Technologies, Inc., and/or other subsidiaries or business units within the Qualcomm corporate structure, as applicable. Qualcomm Incorporated includes Qualcomm’s licensing business, QTL, and the vast majority of its patent portfolio. Qualcomm Technologies, Inc., a wholly-owned subsidiary of Qualcomm Incorporated, operates, along with its subsidiaries, substantially all of Qualcomm’s engineering, research and development functions, and substantially all of its product and services businesses, including its semiconductor business, QCT.