

3GPP TSG RAN Rel-19 workshop
Taipei, June 15 - 16, 2023

RP-230304

Source: ZTE, Sanechips

Agenda: 5

Views on further enhancement of Sidelink Relay in Rel-19



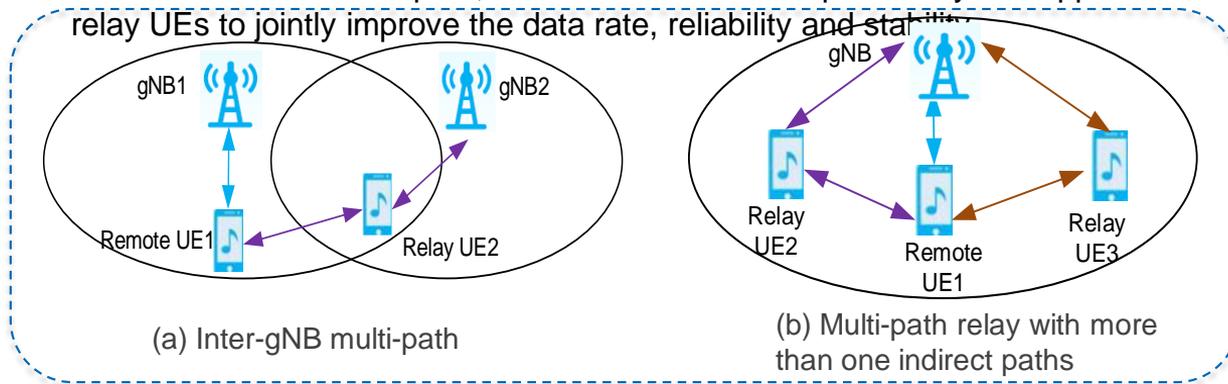
Overview

- ❑ Multi-path relay enhancements
- ❑ Multi-hop U2U/U2N Relays
- ❑ Network assisted U2U relay



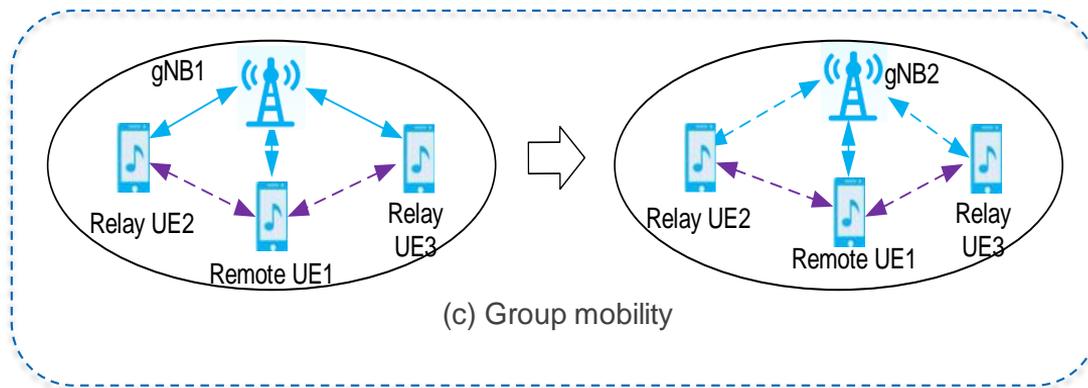
Multi-path relay enhancements (1/2)

- In Rel-18, multi-path relay where a remote UE is connected to network via one direct path and one indirect path via L2 U2N relay, is supported to improve the reliability/robustness as well as throughput [1]. However, it is limited to the intra-gNB case and only one indirect path can be supported.
- For better support of the multi-path relay use cases, it is suggested to extend the following scenarios on top of Rel-18:
 - Multi-path relay for inter-gNB scenario:
 - Direct path and indirect path are served by different gNBs.
 - Multi-path relay with more than one indirect paths:
 - In addition to one direct path, more than one indirect paths may be supported via different L2 U2N relay UEs to jointly improve the data rate, reliability and star



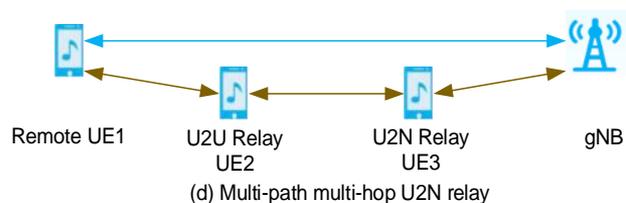
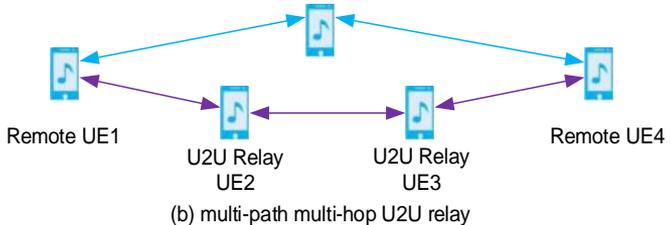
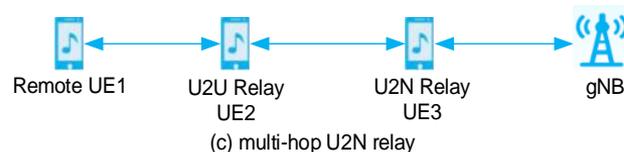
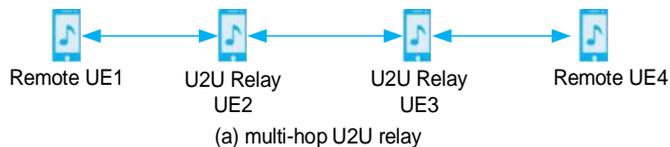
Multi-path relay enhancements (2/2)

- Moreover, the following aspects may be considered for the multi-path relay:
 - Group mobility
 - The remote UE and relay UE move and perform HO together to neighboring gNB
 - Service continuity for inter-gNB HO and path switch
 - The lossless delivery of data packet during inter-gNB HO and path switch
 - Conditional multi-path HO/addition
 - Multi-path HO or path addition based on network conditional configuration



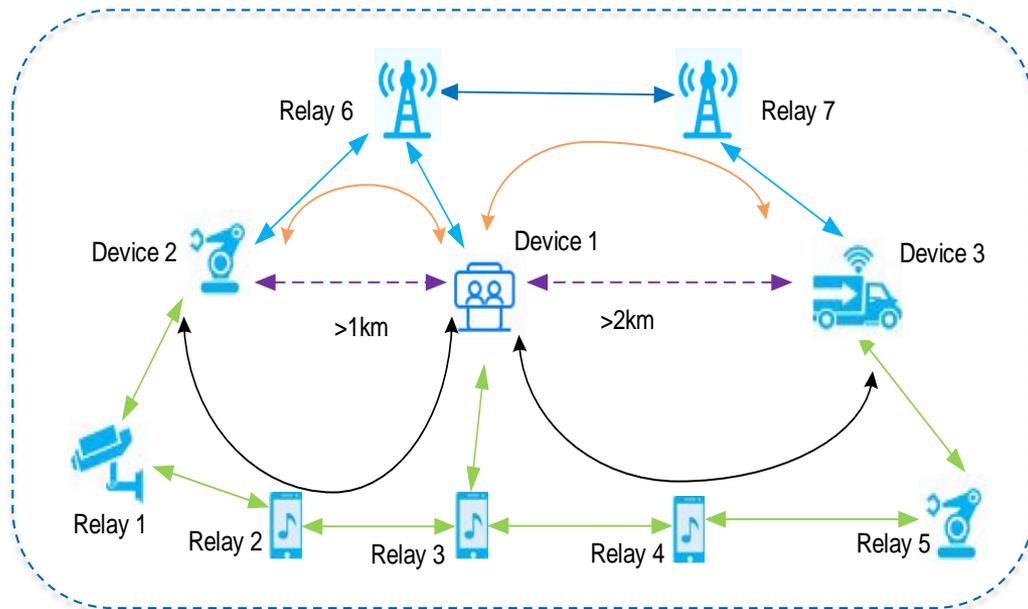
Multi-hop U2U/U2N relay

- Single hop U2N relay and U2U relay are supported in Rel-17 and Rel-18 respectively for coverage extension, which targets a wide range of V2X, Public Safety and commercial services.
- In Rel-19, it is suggested to extend the support to the following multi-hop U2U/U2N relay scenarios:
 - multi-hop U2U relay
 - multi-hop U2N relay
 - multi-path multi-hop U2U relay
 - multi-path multi-hop U2N relay



Network assisted U2U relay (1/2)

- Network assisted multi-hop multi-path U2U relay: combine the multi-hop and multi-path U2U relay and network (Uu) based data forwarding to enable longer distance and higher reliability for the UE-to-UE connection.
 - More flexible networking to extend transmission range
 - Not only UEs but also gNB may act as relay.
 - gNB is stationary and more reliable for relaying.
 - Fault tolerance and robustness can be guaranteed when link failure or system fault happens.
 - Local forwarding restricted to a set of UEs to enhance privacy and security.



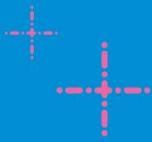
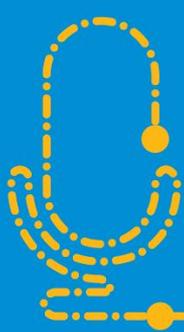
Key issues

- Proximity discovery and routing path detection between UEs with specific group for network based L2 forwarding
- Connection management of relayed connection, bearer mapping and E2E QoS management
- Routing path selection and service continuity during routing path switch
- Management specific UE groups which are permitted to use the multi-hop and multi-path based communication service

Objectives

- Multi-path relay enhancements
 - Support of inter-gNB multi-path relay
 - Multi-path relay with more than one indirect paths
 - Mobility support and service continuity for multi-path relay
- Multi-hop U2U/U2N relay
 - multi-hop U2U/U2N relay
 - multi-path multi-hop U2U/U2N relay
- Network assisted U2U relay
 - Proximity discovery and routing path detection
 - Connection management, bearer mapping and E2E QoS enforcement
 - Service continuity during routing path switch

Thanks



Tomorrow never waits

