

3GPP TSG RAN Rel-19 workshop

Taipei, June 15 – 16, 2023

Agenda Item: 5

RWS-230355



Further enhancement on sidelink relay in Rel-19

China Unicom

Motivation on Sidelink relay enhancement in Rel-19

- ❑ **Motivation 1:** In some vertical industry scenarios, such as intelligent transportation, smart mines, and smart factories, UEs need to use multi-hop relays to improve the data forwarding distance.

- Issue 1: R18 U2N and U2U relay only support single-hop forwarding, which cannot meet the requirements of wide-range forwarding.



intelligent transportation



smart factories

- ❑ **Motivation 2:** In the multi-path scenario, when a remote UE switches to a neighboring cell, it is necessary to maintain a dual link across cells to improve reliability and transmission rate.

- Issue 1: Only intra-gNB multi-path is supported in Rel-18, with limited mobility and service continuity

- ❑ **Motivation 3:** When the UE can indirectly connect to gNB with relay UE, multi-path functionality still can't work if the UE cannot connect to the gNB via Uu interface with poor coverage of the NW.

- Issue: For multi-path, only direct path + 1 hop indirect path is supported in Rel-18.

- ❑ **Motivation 4:** When multiple UEs in a same car with a relay UE (registered in the NW) on it, those UEs cannot be aggregated to the relay at the same time.

- Issue 1: For UE aggregation, only 1 relay UE and 1 remote UE can be aggregated in Rel-18;

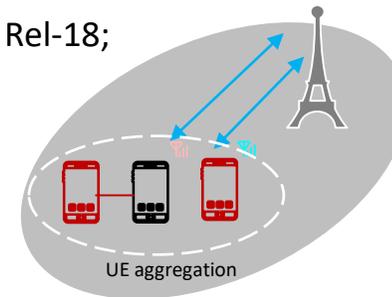


Fig.1 Only one UE can be aggregated to the relay UE in Rel-18

- Issue 2: When aggregated UEs and relay UE moves between different cells together, the service continuity is not guaranteed in Rel-18.

Scope and Objective

- Multi-hop U2N and U2U relay enhancement
 - Relay discovery and (re)selection (if enhancement is needed)
 - Relay adaptation layer for multi-hop support;
 - Control plane procedures;
 - QoS handling, e.g, congestion control of multi-hop;
- Multi-path enhancement
 - Support inter-gNB multi-path;
 - Support multi-indirect path;
 - Mobility and service continuity guarantee;
- UE aggregation
 - Support 1-to-N UE aggregation.
 - Group mobility for U2N relay;

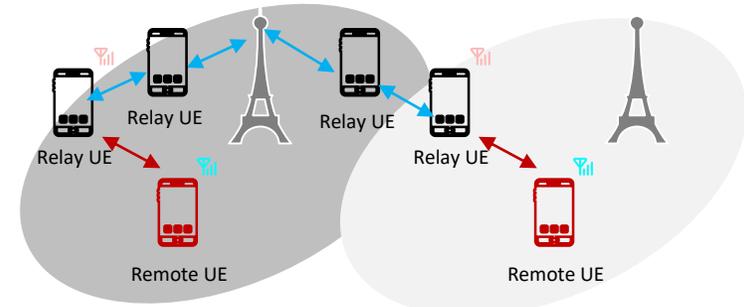


Fig.2 Support intra/inter-cell multi-hop U2N relay

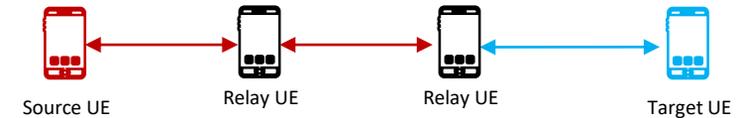


Fig.3 Support multi-hop U2U relay

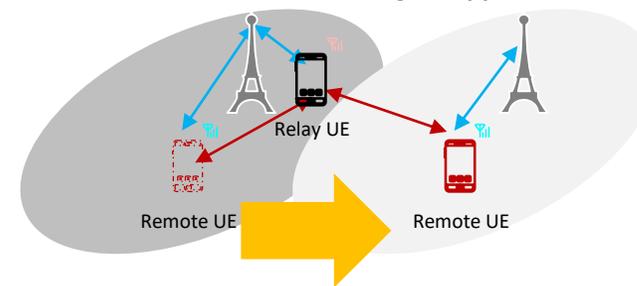


Fig.4 Support inter-gNB multi-path

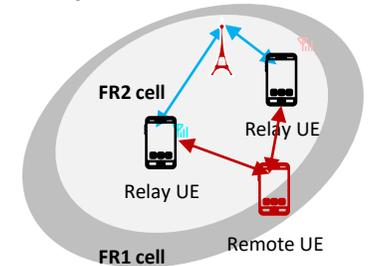


Fig.5 Support multi-indirect path

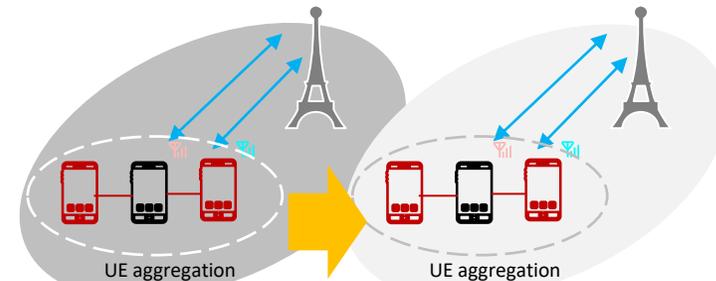


Fig.6 Support 1-to-N UE aggregation and group mobility

Thanks