3GPP TSG RAN Rel-18 workshop
Electronic Meeting, June 28 - July 2, 2021
Agenda Item: 4.3

RWS-210242

Proposal on the work scope of Rel-18 SI for full duplex operation

LG Electronics, KT Corp., SK Telecom, Fraunhofer, CEWiT, IITM, ETRI

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Motivation

- **Motivation**
  - For 5G, many of the new service types (e.g., XR service, AI based service, Self-driving Car) are characterized by dynamic variation of traffic in both DL and UL directions, requiring low latency in the packet delivery
  - For 5G services, demands on the traffic load will be exploding to support various emerging use cases.
  - Existing semi-static or dynamic TDD UL/DL configuration has a limit of delay in time and inter-operator interference issue. Existing FDD scheme has a limitation on the efficient frequency resource utilization for DL/UL direction
  - Full duplex operation within a single carrier should be studied to achieve enhancements in the low-latency and efficient resource utilization in NR.

- **Potential categories for full duplex operation**
  - "gNB Full Duplex & UE Half Duplex", "gNB Full Duplex & UE Full Duplex"
  - "Subband-wise Full Duplex", "Spectrum Sharing Full Duplex"

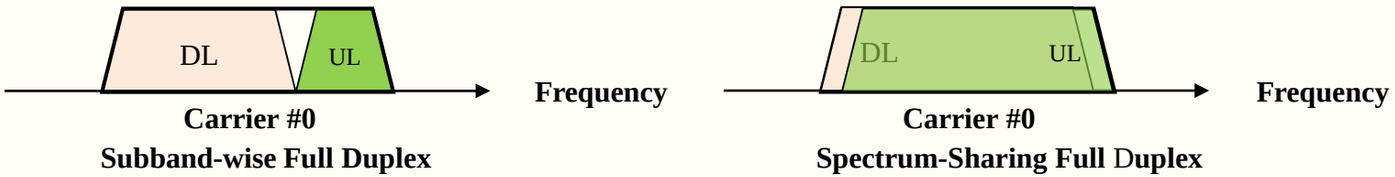

Figure 1.

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Proposed Objective [1/2]

- **Study feasibility of full Duplex operation in unpaired spectrum [RAN1, RAN4]**
  - Define/prioritize scenarios for Full Duplex operation in terms of some aspects such as:
    - Full duplex operation in gNB and/or UE
    - Frequency resource utilization (e.g., separated frequency resource in a carrier is used for DL and UL, same frequency resource in a carrier is used for simultaneous operation of both DL and UL), etc.
    - Frequency range (e.g., FR1, FR2, FR-X)
    - Deployment scenario (e.g., Rural, Urban, Indoor, Isolated)
  - Antenna configuration (e.g., Single-/multi-panel, Co-located/distributed antenna),
  - Note1: In a resource allocation perspective, full duplex operation means simultaneous TX-RX in a same carrier
  - Note2: The study may focus on Uu link in unpaired spectrum, but necessity of enhancements for other scenarios(e.g. IAB, wireless backhaul, sidelink, paired spectrum) may be considered further
  - Note3: RAN1 studies general objectives, while RAN4 confirms the feasibility

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Proposed Objective [2/2]

- **Study standardization impacts and potential enhancements for the selected scenarios for full Duplex operation in unpaired spectrum such as: [RAN1]**
  - Resource allocation (e.g., BWP)
  - Interference handling (i.e., self-interference, UE-UE interference, gNB-gNB interference)
  - MIMO operation (e.g., Beam management, Reference signal, CSI measurement/report, Multi-TRP/Cell)
  - Duplex adaptation

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