

3GPP RAN Plenary #102

RP-233377

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Agenda Item: 9.1.1.3

Views on scope for NR Duplex evolution in Rel-19

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WI on Evolution of Duplex operation

The following are the potential objectives for Rel-19 Duplex Evolution WI by RAN chair [RP-232745]. In this contribution, we share our views on the **remaining issues** for the WI on SBFD operation.

Evolution of duplex operation WI

📶 References: [RWS-230488](#), [RP-231540](#), [RP-232613](#)

📶 Potential objectives:

- For subband non-overlapping full duplex (SBFD) operation at gNB side within a TDD carrier
 - **[Semi-static/dynamic]** indication of time location of SBFD subbands to UEs **[in RRC_CONNECTED mode]**
 - **Semi-static indication of** frequency domain location of SBFD subbands to UEs **[in RRC_CONNECTED mode]**
 - UE transmission and reception behavior and procedures in SBFD symbols and/or non-SBFD symbols
 - Note: followings are assumed based on TR 38.858
 - SBFD operation Option 4
 - Coexistence between legacy UEs and SBFD aware UEs in the cell operating SBFD at gNB side
 - SBFD scheme within a single configured DL and UL BWP pair with aligned center frequencies
 - Up to one UL subband for SBFD operation in an SBFD symbol (excluding legacy UL symbol/slot) within a TDD carrier
 - At least adjacent channel coexistence between two operators should be considered as a minimum.
- Specify enhancements for CLI handling:
 - Support both the gNB-to-gNB co-channel CLI handling scheme(s) and UE-to-UE co-channel CLI handling scheme(s) (the detailed schemes are to be down-selected from those in TR38.858)
 - The SBFD operation drives the CLI enhancements, which are expected to be applicable to the dynamic/flexible TDD operation but without dedicated optimization
- RF requirements for SBFD operation at gNB

SBFD operation for RRC Idle/Inactive UEs

Random access in SBFD symbols

- To additionally leverage SBFD UL coverage and latency reduction during initial access procedure, RRC-Idle UE should have the knowledge of the time and frequency locations of the SBFD subbands by broadcast signalling.
 - RAN1 concluded that random access in SBFD symbols could potentially reduce the random-access latency, reduce the PRACH collision probability and/or improve the coverage of PRACH and Msg3.
 - These benefits should be applicable to both SBFD-aware UEs and non-SBFD aware UEs including legacy UEs. Then, for backward compatibility, the PRACH resources can be advertised as UL for Idle UEs, not as SBFD.

Support random-access in SBFD symbols for RRC Idle/Inactive in addition to RRC-Connected UEs

Semi-static vs dynamic SBFDD operation

No sufficient motivation for dynamic SBFDD

- Semi-static SBFDD operation should be baseline for gNB SBFDD operation in Rel-19.
 - SBFDD frequency configuration should be the same across all SBFDD symbols.
 - SBFDD time configuration should be common across all cells to avoid inter-gNB CLI.
- RAN1 evaluation study on the benefits of dynamic SBFDD was not conclusive
 - Additionally, Dynamic SBFDD will introduce complexity in both the gNB and UE.
 - RRC reconfiguration can be used to update SBFDD time configuration or fallback to TDD, if needed.

No need to specify dynamic SBFDD or fallback to TDD operation in Rel-19

CLI enhancement for SBFDD operation

Potential CLI enhancement for Duplex Evolution [RAN1, RAN2, RAN3]

- Based on the outcome of TR 38.858, the following summarizes our views on the required CLI enhancement for SBFDD operation which are also applicable to dynamic/flexible TDD operation
 - Enhancement for UE-UE co-channel CLI [RAN1, RAN2, RAN3]
 - L1/L2 inter-UE CLI measurements and reporting using the CSI framework as baseline.
 - QCL TypeD indication for CLI measurement.
 - Finer frequency granularity (e.g. subband) for CLI measurements and reporting.
 - Enhancement for gNB-gNB co-channel CLI [RAN1, RAN2, RAN3]
 - CLI measurement and/or channel measurement including related inter-gNB info exchange
 - Spatial domain coordination including beam-related info exchange
 - Power domain enhancement: separate uplink power control parameters for symbols with and without CLI, and downlink transmission power adjustment including related inter-gNB info exchange.
 - Time and frequency resource coordination between the gNBs including semi-static SBFDD configuration exchange.

Support enhancement for both UE-UE and gNB-gNB co-channel CLI



Thank you

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