

The vivo logo is positioned in the top left corner of the slide. The background of the entire slide is a dark blue, abstract image with a central black point from which numerous bright blue, fiber-like lines radiate outwards, creating a starburst or nebula-like effect. The lines vary in thickness and intensity, with some appearing as thin streaks and others as thicker, more prominent bands. The overall color palette is dominated by shades of blue, from deep navy to bright cyan.

3GPP TSG RAN Rel-19 workshop

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Agenda Item: 5

Source: vivo

Title: Views on NR duplex evolution in Rel-19

Document for: Discussion

Motivations

- Following benefits are expected for SubBand non-overlapping Full Duplex (SBFD) at the gNB side and half-duplex at the UE side within a conventional TDD band with DL heavy configuration:
 - Enhanced UL coverage and capacity
 - Reduced latency

NR duplex evolution in Rel-19 – SBFD signaling and procedures

- Support SBFD operation for SBFD-aware UEs in RRC_CONNECTED state.
 - Do not support SBFD operation for SBFD-aware UEs in RRC_IDLE/INACTIVE state
- Support semi-static SBFD configuration in terms of time and frequency location for subband(s) within a TDD carrier, where SBFD is operated within a single configured DL and UL BWP pair with aligned center frequencies.
 - The subband frequency resources across different SBFD symbols are the same
 - Allowing the DL receptions inside/outside semi-statically configured DL subband(s) and UL transmissions inside/outside the semi-statically configured UL subband
- Support necessary enhancements on physical layer signals/channels and procedures for SBFD operation.
 - E.g. Resource allocation, DL and UL collision handling in a SBFD symbol for a SBFD-aware UE
- Note: SBFD symbol is defined as symbol with subbands that gNB would use for SBFD operation.

- For interference handling due to SBFD operation, considering the following enhancement
 - Information exchange among gNBs of semi-static SBFD time and frequency configuration for inter-gNB Cross Link Interference (CLI) handling (RAN3 impact)
 - Identify, if any necessary enhancements on the L3 CLI measurement and report framework for inter-UE inter/intra-subband CLI.
 - e.g., to support RSRP measurement within the UL subband and RSSI measurement within the DL subband
 - Potential UL power control enhancements for inter-subband CLI and/or gNB self-interference handling

NR duplex evolution in Rel-19 – Dynamic/Flexible TDD



- Following schemes for gNB-to-gNB and UE-to-UE CLI handling for dynamic/flexible TDD (dTDD) has been proposed and evaluated by at least one companies in RAN1:

CLI handling Schemes	Details	vivo's views
Scheme 1: gNB-to-gNB CLI/Channel measurement	UL resource muting and advanced receiver	May be achieved by gNB implementation
Scheme 2: Coordinated scheduling	Time/Frequency domain coordinated scheduling	Backhaul exchange of “intended TDD configuration” already supported by current spec. No additional enhancement specific for dTDD
	Protected dTDD	Can be achieved by gNB implementation
Scheme 3: Spatial domain enhancements	Spatial domain handling (Tx-nulling)	To facilitate gNB-to-gNB channel measurement, information exchange on NZP CSI-RS resource configurations may be required among gNBs
Scheme 4: Enhance the power control mechanism	UL power control	<ul style="list-style-type: none"> For DG PUSCH, can be achieved by gNB implementation. For CG PUSCH, the need has not been justified so far. <ul style="list-style-type: none"> If necessary, the UL power control schemes for Sbfd operation can be reused for dTDD.
	DL Power control	May be achieved by gNB implementation

- Whether/what inter-gNB/inter-UE CLI enhancements are required specifically for dynamic/flexible TDD depends on the SI outcome

- Specify the RF requirements at gNB side
 - Considering the self-interference, the inter-subband CLI, and the inter-operator CLI
- No RF impact at the UE side due to network side SBFD operation

THANK YOU.

谢谢。