3GPP TSG-RAN Meeting # 104
Shanghai, China, June 17 – 20, 2024

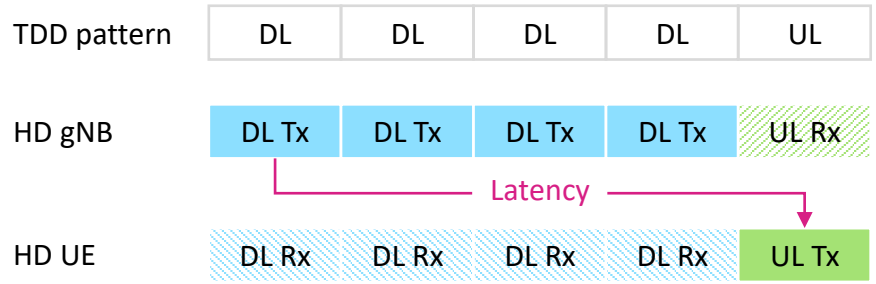
RP-241365
Agenda Item 9.11

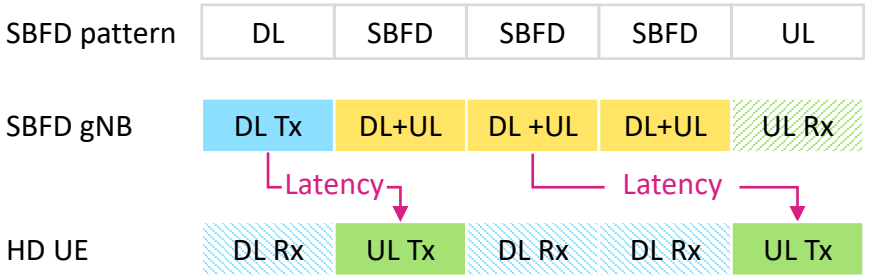
Feasibility of SBFD UE for latency-sensitive eMBB

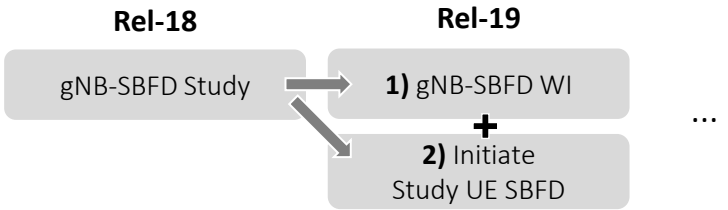
MediaTek Inc.

UE-SBFD Study
Motivation

- **TDD** bands offer large bandwidth. However, fixed TDD UL/DL patterns result in **increased latency**, and **limited capacity and coverage**
  - This negatively impacts system capacity for latency-sensitive services
- **gNB-SBFD** full duplex alleviates the issue to <u>some</u> extent
  - However, **UE HD operation remains the latency bottleneck** due to non-simultaneous UL/DL UE operation
- **UE-SBFD would fully address these issues and:**
  - Enable FDD-like low-latency in TDD bands, to improve capacity for latency-sensitive services, particularly important for the success of XR





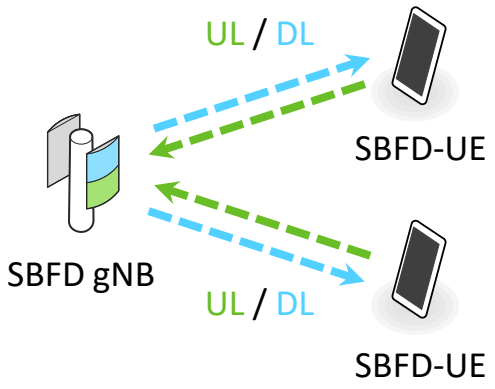


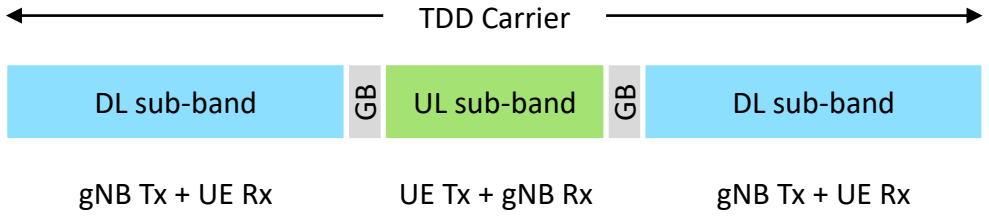
Proposal
Study full-duplex operation at UE

- Study full-duplex operation at UE: Non-overlapped simultaneous transmission and reception

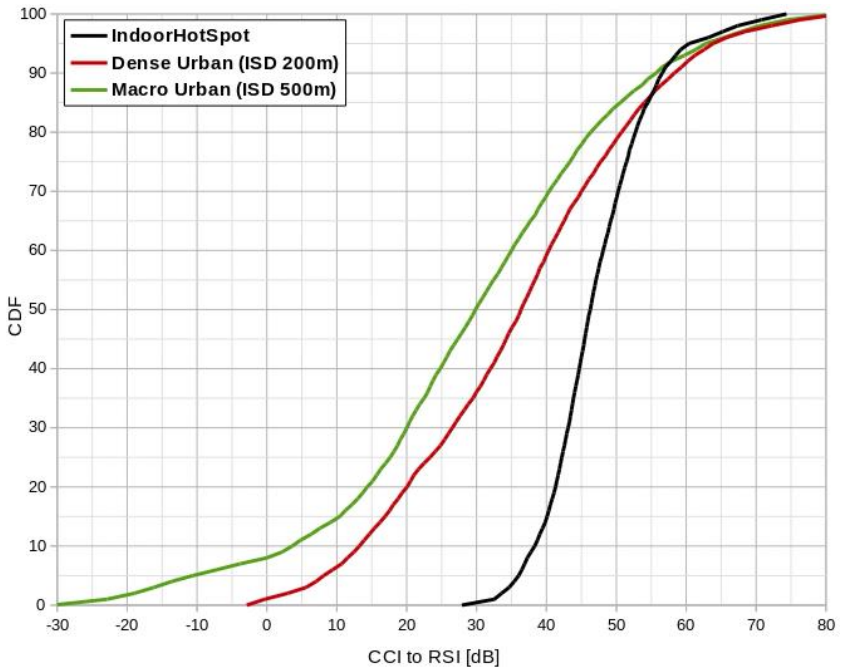
- Investigate aspects to allow constraining UE complexity:
  - Level of frequency separation (if needed) between Rx and Tx sub-bands
  - Opportunistic operating conditions (e.g., UE Tx power level, inter-cell-interference level, UE Tx allocation, etc.)
  - Different device types

- Long-term objective: A feasibility study in R19 to provide a good foundation for the 6G study in R20.

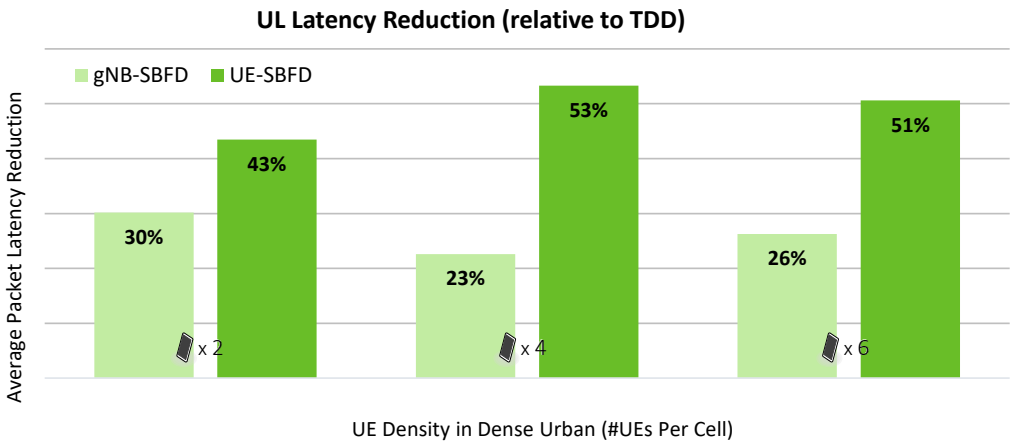


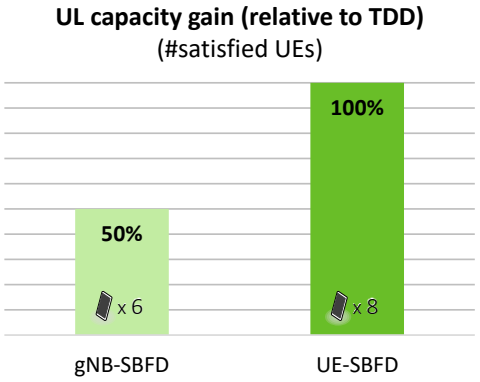


Feasibility and Performance results



CCI: inter-cell interference **RSI:** Residual self-interference





- Negligible residual self-interference relative to CCI for most of the time
- Noticeable improvements to latency
- Substantial improvements to capacity for latency-sensitive services e.g. XR

Dense Urban (200m ISD) XR Traffic (10Mbps data-rate, 30ms PDB) FR1, 4GHz frequency carrier

Proposal

SA/CT Dependency: No

Study non-overlapping full-duplex at the UE, with the following proposed detailed objective

Objective: Identify possible schemes for non-overlapping full-duplex UE and evaluate their feasibility and performance for the following (RAN1, RAN4);

- UE baseband and RF aspects, covering both FR1 and FR2 ranges.
- Different types of devices; smartphones, compact devices for XR, CPE, etc.
- Applicable deployment scenarios

Note: Coexistence and CLI handling mechanisms to be addressed in the WI on gNB-SBFD.

Thank you!