

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

RWS-210054

Agenda Item: 4.1
Source: Spreadtrum Communications
Title: R18 Flexible/Full Duplex considerations
Document for: Discussion and decision



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UNISOC (Shanghai)Technologies Co., Ltd.



Motivation & Challenges

Motivation

- Flexible UL/DL resource adaption
 - Satisfy different UL/DL traffic demands for varied service types—demanding in TDD bands
- Latency reduction in unpaired spectrum
 - Latency problem is not fully solved for unpaired spectrum
- Uplink coverage enhancement
 - More UL resources allow more UL repetitions—demanding in TDD bands

⇒ **Study flexible/full duplex on TDD bands first.**

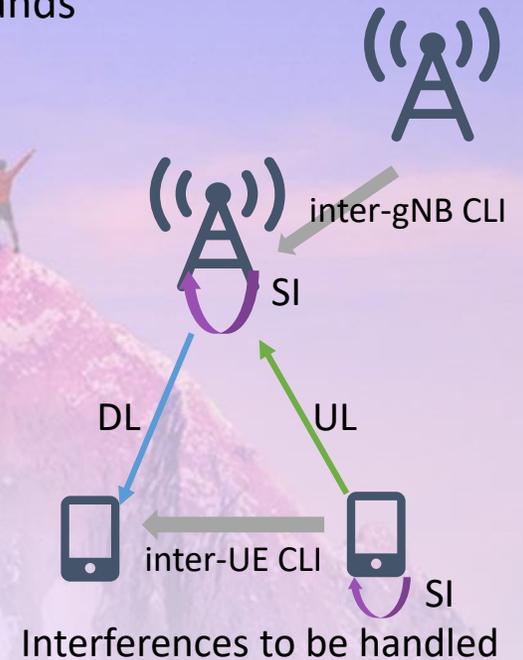
Challenges

- Self-interferences between DL & UL in FD nodes must be cancelled
 - even more challenging for UE due to limited space

⇒ **Any full duplex schemes at the UE side should not be considered in Rel-18.**

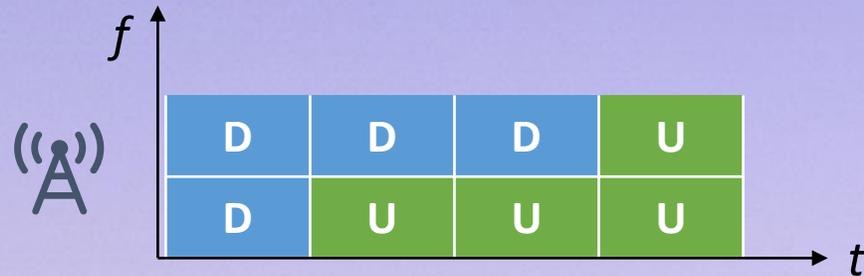
- Cross-link interference should be avoided or suppressed
 - Only UE-to-UE CLI measurement has been standardized in R16

⇒ **Study and specify BS-to-BS CLI measurement, avoidance and suppression.**



Scenarios – subband full duplex and full duplex

Scenario 1: subband full duplex



- Same latency as dynamic TDD with higher spectrum efficiency
- UL/DL resource can be adapted flexibly
- Self-interference is not so severe as FD
- Less severe CLI than FD, especially for UEs not supporting CLI measurement
- Easier to implement than FD from gNB side

Scenario 2: full duplex

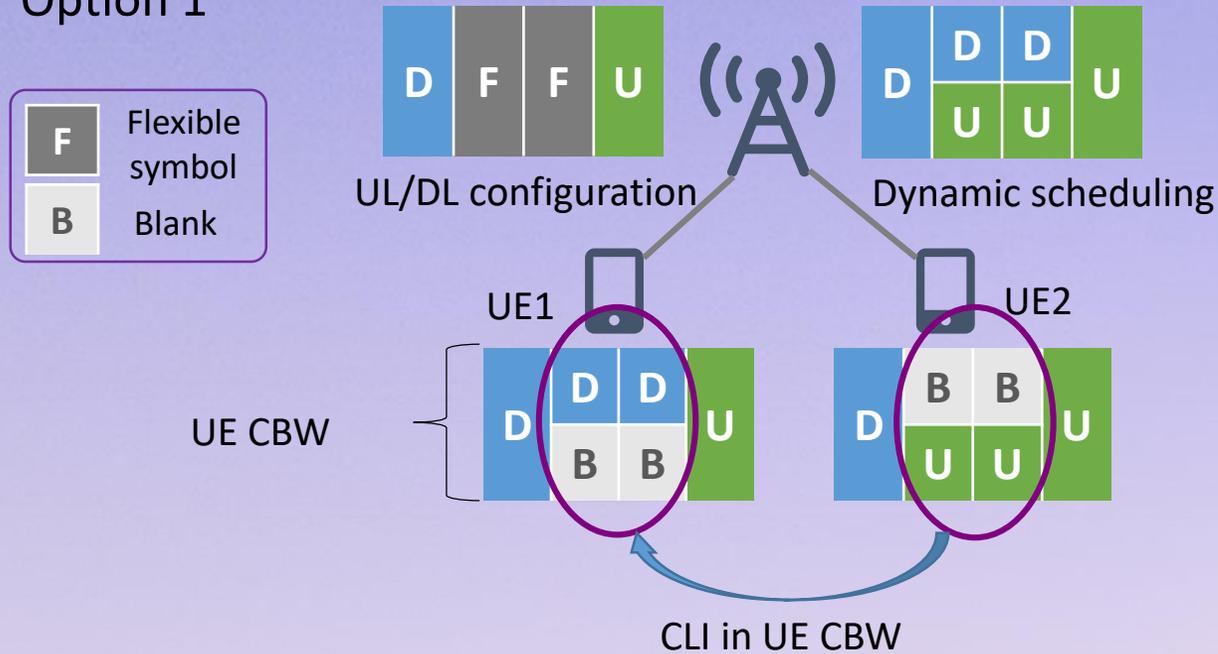


- Same latency as dynamic TDD with higher spectrum efficiency
- UL/DL resource can be adapted flexibly
- Self-interference is severe at gNB
- Inter-UE CLI should be handled. CLI to UEs not supporting CLI measurement is hard to avoided.
- Much more challenging to implement than subband FD from gNB side

From the point of implement complexity and interference avoiding/suppression, subband full duplex is the first priority.

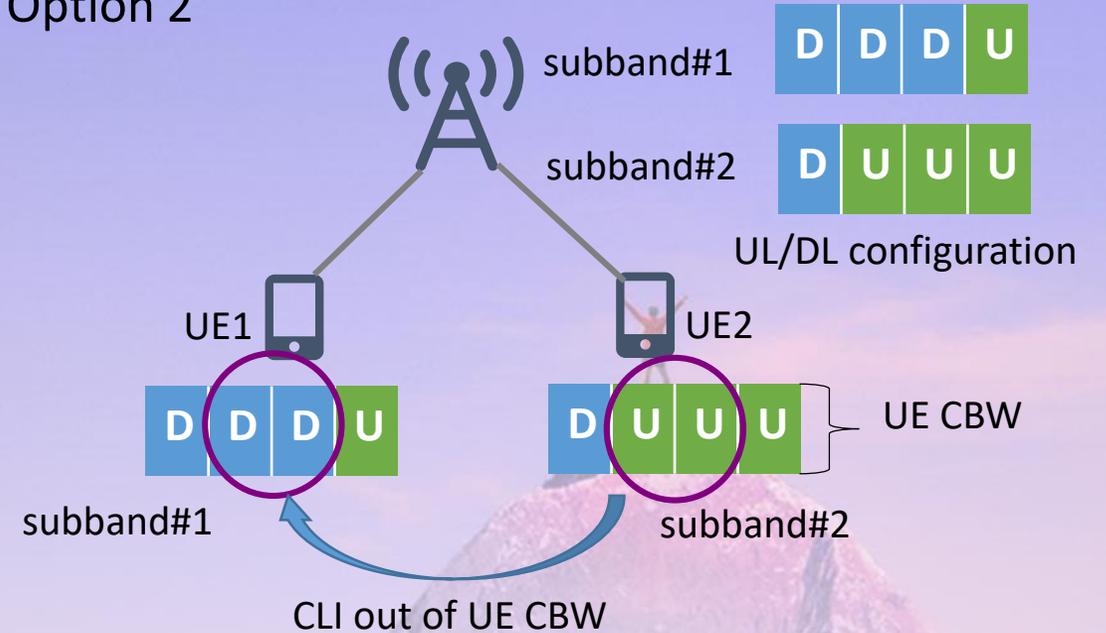
Potential solution for Subband Full Duplex

Option 1



- Pros
 - Already supported from UE side
 - Efficient support both low latency and different UL/DL traffic demands
- Cons
 - CLI on legacy UEs which don't support R16 CLI measurement is hard to avoid.

Option 2

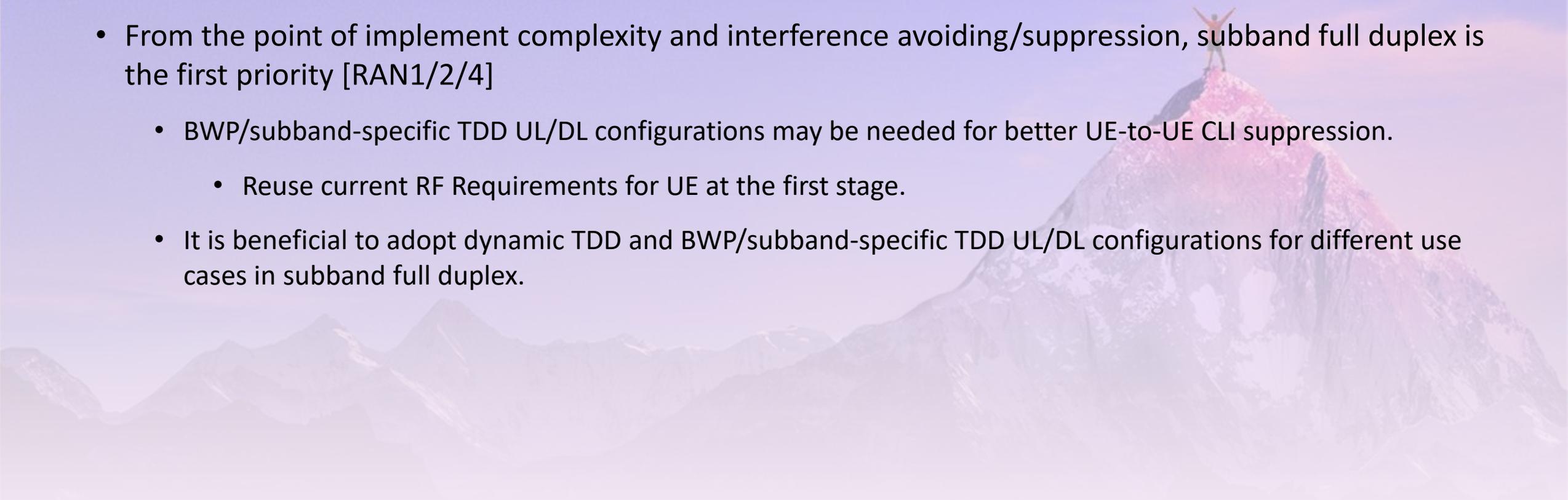


- Pros
 - UE-to-UE CLI can be suppressed better compared to option1.
 - Efficient satisfy different UL/DL traffic demands
- Cons
 - BWP/subband-specific TDD UL/DL configurations needed within one cell
 - latency is higher than option 1 due to longer waiting time or BWP/subband switch delay

**BWP/subband-specific TDD UL/DL configurations may be needed for better UE-to-UE CLI suppression.
 Option 1 and option 2 are complementary.**

Proposal

- Any full duplex schemes at the UE side should not be considered in Rel-18.
- Study and specify BS-to-BS CLI measurement, avoidance and suppression [RAN3/4/1].
- Study flexible/full duplex on TDD bands first [RAN1/4].
- From the point of implement complexity and interference avoiding/suppression, subband full duplex is the first priority [RAN1/2/4]
 - BWP/subband-specific TDD UL/DL configurations may be needed for better UE-to-UE CLI suppression.
 - Reuse current RF Requirements for UE at the first stage.
 - It is beneficial to adopt dynamic TDD and BWP/subband-specific TDD UL/DL configurations for different use cases in subband full duplex.



Thank you

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