



# Motivation for cross-link interference management for NR in Rel-16

Huawei, HiSilicon



# Status of Rel-15 CLI and duplexing work

- It was agreed that NR targets to support duplexing flexibility of unpaired and paired spectrum
- CLI of different cells belonging to a same operator was worked on during Rel-15 NR WI
  - Multiple companies showed the benefits of CLI mitigation schemes
  - Majority of companies supported specification work addressing at least for UE-to-UE CLI
  - Full consensus on the benefits of CLI mitigation schemes was not achieved
  - Work on CLI was suspended as an outcome of RAN#77 Rel-15 NR WI prioritization
- Common understanding among companies that CLI mitigation scheme can be applied to duplexing flexibility operation on both unpaired and paired spectrum
- There was no discussion about multi-operator coexistence for duplexing flexibility during Rel-15 NR WI
- Rel-15 NR frame structure design fully considered dynamic slot configuration

# Motivation of Rel-16 CLI and duplexing work

- Further study on duplexing flexibility is necessary for the industry to understand its practical benefits
  - Gains of duplexing flexibility heavily depends on co-channel and adjacent channel CLI mitigation
- Co-channel CLI arising between cells of a same operator needs to be addressed, e.g.
  - UE-to-UE CLI mitigation and gNB-to-gNB CLI mitigation
  - UE-to-UE CLI measurement and reporting, gNB-to-gNB CLI measurement and interference coordination, etc.
- Adjacent CLI arising from multiple-operators needs to be addressed, considering both
  - NR-to-NR adjacent channel interference due to duplexing flexibility, and
  - LTE-to-NR and NR-to-LTE adjacent channel interference due to duplexing flexibility
- Mechanisms to address co-channel and adjacent channel CLI can be commonly applied to duplexing flexibility operation of both unpaired and paired spectrum
- RAN4 to define proper bands for duplexing flexibility of paired spectrum

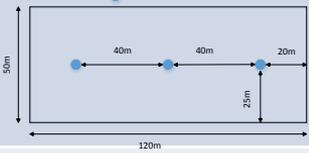
# Example for TDD: Benefits of UE-to-UE CLI mitigation

- Scheme 1: indoor hotspot, 100% UEs do not have CLI management capability
- Scheme 2: indoor hotspot, 50% UEs do not have CLI management capability, while the other 50% UEs have CLI management capability
- Scheme 3 : indoor hotspot, 100% UEs have CLI management capability.

Feature	5%-tile DL UPT (Mbps)	DL Average UPT (Mbps)	5%-tile UL UPT (Mbps)	UL Average UPT (Mbps)
Scheme 1	9.11	52.26	4.26	36.16
Scheme 2	12.66	61.16	4.42	39.86
Scheme 3	19.70	71.09	5.52	42.92

**UE-to-UE CLI mitigation shows clear benefits for duplexing flexibility operations**

# Simulation Assumptions

Parameters	Assumptions	Parameters	Assumptions
Layout	Single layer Indoor floor: (3 TRP per 120m x 50m) 	BS antenna height	3m
Inter-BS distance	40m	BS antenna element gain + connector loss	5dBi
Minimum BS-UE (2D) distance	0m	BS antenna tilt	90deg
Minimum UE-UE (2D) distance	3m	BS receiver noise figure	5dB
Carrier frequency	4GHz	UE antenna elements	2Tx and 2Rx
Simulation bandwidth	20MHz per CC for 4GHz	UE antenna configuration	Follow TR 38.802
Channel model	Follow TR 38.802	UE antenna height	1.5m
Penetration loss	Follow TR 38.802	UE antenna gain	Follow the modeling of TR36.873
BS Tx power	24 dBm PA scaled with simulation BW when system BW is higher than simulation BW. Otherwise, 24 dBm	UE receiver noise figure	9 dB
UE Tx power	Maximum 23 dBm	Traffic model	FTP traffic model 3 with packet size 0.5Mbytes DL: UL=1:1
BS antenna configuration	(M, N, P, Mg, Ng)=(4, 4, 2, 1, 1) (dH, dV)=(0.5, 0.5) λ	UE distribution	For FTP traffic model 3: 10 users per TRP 100% indoor (3km/h)
BS antenna configuration	Ceiling-mount, Follow TR 38.802	UE receiver	MMSE-IRC
		BS receiver	MMSE-IRC
		UE association	based on RSRP measurement
		Transmission mode	SU-MIMO



*Thank you !*

Copyright©2015 Huawei Technologies Co., Ltd. All Rights Reserved.

The information in this document may contain predictive statements including, without limitation, statements regarding the future financial and operating results, future product portfolio, new technology, etc. There are a number of factors that could cause actual results and developments to differ materially from those expressed or implied in the predictive statements. Therefore, such information is provided for reference purpose only and constitutes neither an offer nor an acceptance. Huawei may change the information at any time without notice.