

**3GPP TSG RAN Rel-19 workshop
Taipei, June 15 - June 16, 2023**

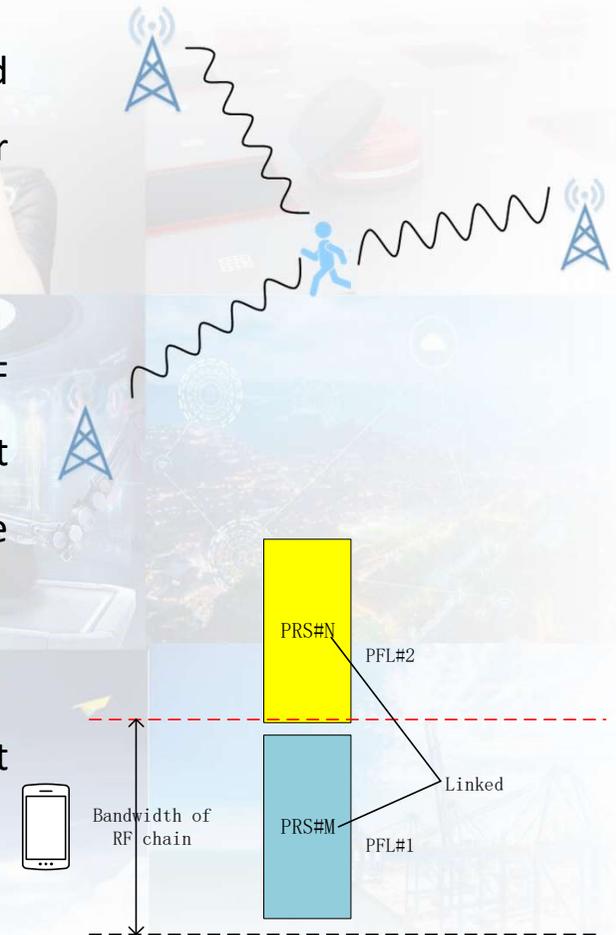
RWS-230080

Agenda Item: 5
Source: Spreadtrum Communications
Title: Positioning enhancements for Rel-19
Document for: Discussion and decision

Evolution of existing features - Uu Positioning

□ Motivation on enhancements for Uu Positioning

- In Rel-18, carrier phase measurements is based on legacy PRS/SRS and limited to a single PFL/carrier, which creates difficulties in tracking the carrier phase and maintaining the phase continuity.
- PRS or SRS BW aggregation in R18 requires UE to support a large RF bandwidth. However, some UE's RF bandwidth is limited and cannot simultaneously measure/transmit positioning reference signals on multiple PFLs/carriers, but they have the need for high-precision positioning.
- Currently, positioning measurements in NR unlicensed carriers are not supported.



Evolution of existing features - Uu Positioning

Objectives for Rel-19 Uu Positioning

- Support enhancements on carrier phase measurements
 - Enhancements on DL PRS and UL SRS for carrier phase measurements
 - Support the carrier phase measurements from multiple DL PFLs/UL carriers
- Support DL and UL Positioning in unlicensed spectrum
- Support PRS/SRS hopping for Non-Redcap UE
 - Support DL PRS Tx hopping across PFLs
 - Support UL SRS Tx hopping across carries for positioning



Evolution of existing features - SL Positioning

□ Motivation on enhancements for SL Positioning

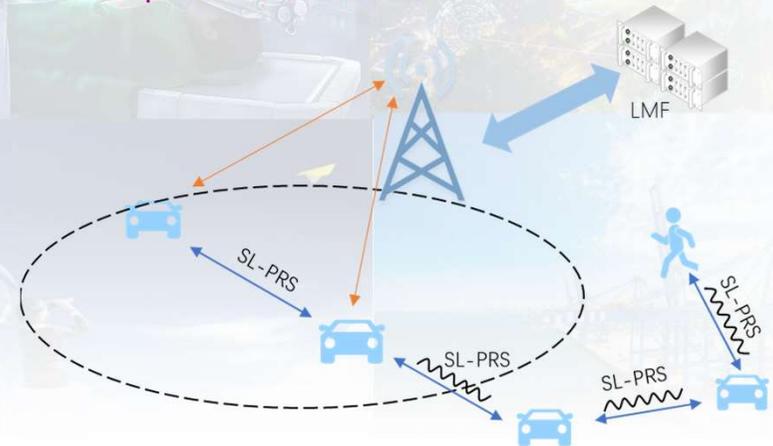
- In R18, SL positioning accuracy requirement of Set B can not be satisfied in most of use cases.
- In R18, SL PRS bandwidths of up to 100 MHz in FR1 spectrum is supported. However, it is almost impossible to provide a bandwidth of 100MHz in the ITS bands in FR1. In addition, SL unlicensed spectrum access will be completed in R18.
- The positioning method based on carrier phase measurement has been supported in Uu positioning. Introducing carrier phase measurement based positioning methods into SL positioning to achieve high-precision positioning for some use case is a straightforward matter.
- For VRU and pedestrian UE, power consumption for SL positioning needs to be considered.

Accuracy requirements @90% of UEs	V2X	IIOT	Public safety	Commercial
Horizontal (absolute or relative)	Set A: 1.5m Set B: 0.5m	Set A: 1m Set B: 0.2m	1m	1m
Vertical (absolute or relative)	Set A: 3m Set B: 2m	Set A: 1m Set B: 0.2m	Set A: 2m Set B: 0.3m	2m

Evolution of existing features - SL Positioning

Objectives for Rel-19 SL Positioning

- Support SL positioning based on SL carrier phase measurements.
- Support SL PRS transmission using unlicensed spectrum.
 - Study, and if justified, specify the necessary change(s) on channel access mechanism of SL-U for SL PRS transmission
 - Study, and if justified, specify the necessary change(s) on physical structure of SL PRS and associated channel(s)
 - Specify the signaling procedure to support SL PRS transmission using unlicensed spectrum
- Support SL PRS transmission in FR2 depends on the progress of SL communication in FR2
- Specify enhancements on SL PRS transmission to reduce power consumption of the UEs.
 - Support partial sensing for SL PRS resource allocation
 - Support DRX for SL positioning



Thanks

