



3GPP TSG RAN Rel-18 workshop

RWS-210176

Electronic Meeting, June 28 - July 2, 2021

Enhanced support for multi-SIM devices in Rel-18

Source: vivo

Document for: Discussion & Decision

Agenda Item: 4.3

- Multi-SIM(MUSIM) devices are popular in practical network
 - Almost all UE vendors have MUSIM phone products
 - MUSIM phones may come with different capabilities, such as: Single-Tx/Single-Rx/Dual-Rx, Dual-Tx/Dual-Rx
- MUSIM device operation may bring some challenges
 - Some expected to be addressed for Single-Tx/Single-Rx/Dual-Rx in Rel-17, such as:
 - Paging monitoring collision
 - Data loss/resource waste in one NW due to activity in another NW
 - Priority determination between incoming MT service from NW A and ongoing service in NW B
 - Other challenges are not addressed in Rel-17, such as
 - Support for Dual-Tx/Dual-Rx MUSIM devices
 - Performance enhancement for intra-operator/shared Network

Support for Dual-Tx/Dual-Rx MUSIM devices

- **Motivation**

- Interoperability issues have already emerged between dual-Tx/dual-Rx MUSIM devices and Network, e.g.
 - In Network A, UEA/USIM-A can report 2 Tx chain capability in UL when UEB/USIM-B is in RRC idle in Network B. If UEB goes back into RRC Connected, the MUSIM device has to tune away one Tx chain to UEB. If the Network A cannot adapt to the changes in UL ports, then Network A would not be aligned with the UE. Consequences:
 - Demodulation failure
 - Radio link failure

- **Solution**

- Enable RRC Connected UE in Network A to switch partial of Tx/Rx chains to Network B for some activities
- Sync between the Network A and the UE A about the available UE capabilities, i.e., when UE changes from 2 Tx chain to 1 Tx chain and vice versa

Performance enh for intra-operator/shared Network

- Motivation

- Large ratio of MUSIM devices are inserted with USIMs from the same operator
 - According to our statistics, in China 33% of dual-USIM devices have all USIMs for one operator
- Case of Inter-operator RAN sharing scenario
 - dual-USIM devices with USIMs from different operators
- Performance improvement can be achieved for intra-operator/shared Network
 - wrt signalling overhead UE power consumption and user experience

- Network awareness of two USIMs (UEs) belonging to one MUSIM device

- Reduce Signalling overhead via Unified /common mobility management, e.g.
 - Combined TAU, RNAU, handover
 - Measurement: Meas. Config./results to be sent/reported to/from only one UE
- Paging monitoring in most power saving way
 - Paging UEs in one device within the same PO
- Provide DSDA-like user experience via cell phone with DSDS capability
 - UEs in one device work with a dynamic TDM manner to provide DSDA-like user experience, e.g. playing game with UE A while calling with UE B

Potential Objectives

- Specify mechanism for UE to notify Network A of its capability update when it tunes away partial Tx or Rx chains from Network A (for MUSIM purpose) [RAN2]:
 - RAT Concurrency: Network A is NR. Network B can either be LTE or NR.
 - Applicable UE architecture: Dual-Rx/Dual-Tx, Single-Tx/Dual-Rx
- Specify mechanism to notify the serving network about the information of UEs in one device in case both UEs are served in the same cell [RAN2]:
 - RAT Concurrency: Network is NR.
 - Applicable UE architecture: Single-Rx/Dual-Rx/Single-Tx, Dual-Rx/Dual-Tx

THANK YOU.

谢谢。