3GPP TSG RAN Rel-19 workshop RWS-230333

Taipei, June 15 - 16, 2023

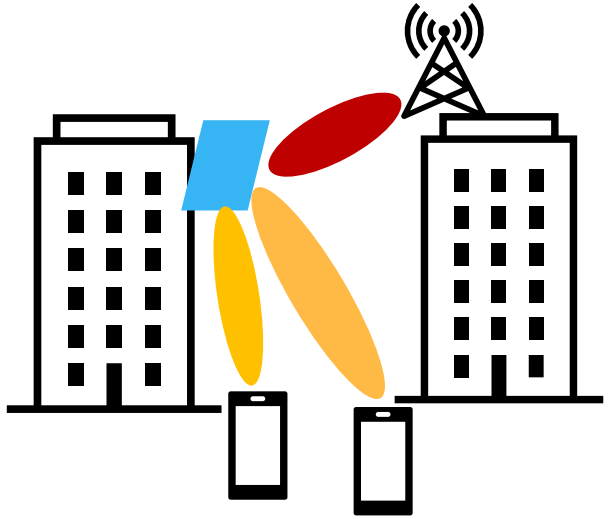
Agenda item: 5

Proposal on Reconfigurable Intelligence Surface

Rakuten Mobile

Rakuten Mobile

Reconfigurable Intelligent Surface (RIS)



Motivation:

RIS is a Low power, programmable surface, capable to control radio propagation.
Compared with network-controlled repeater (NCR), **deployment scenario** of RIS is different, **e.g.; on the wall of the building, in-buildings, and so on.**
Like NCR, RIS can be an interesting nodes which **provides extension of coverage especially in high frequency range**.

Observation on RIS technical challenges

- **Unknown channel model**
  - 3GPP has never studied the RIS
- **Interference to adjacent frequency ranges**
  - How to handle uncontrollability of the reflection of adjacent frequency ranges should be clarified.

To clarify these aspects, **channel model study should be conducted**, before specification

- The study may focus on **FR2/3 frequencies** and may assume interference mitigation by sharp beam width.
- If 3GPP assumes specific detailed deployment scenario for evaluations, ray tracing will produce more reliable evaluation result.

- **Controllability of beam for access/backhaul link**
  - Reusing Rel-18 NCR framework is baseline.
  - More coarse control may be also considered for more moderate mobility environment.
  - Potential necessity of interference mitigation techniques, depending on the result of channel model study.

Rel-18 NCR framework is expected to be reused. Further necessary enhancements may be discussed, depending on the feasibility study based on the discussed channel model.

Proposal of RIS as Rel-19 topic

- Proposal 1:
  Conduct at least channel model study of RIS in Rel-19 timeline.
- Proposal 1-1:
  FR2/3 is the priority of the channel model study.
- Proposal 2:
  In the study, channel model should be studied with consideration of deployment scenarios.
- Proposal 3:
  Initial feasibility study with assuming control framework of NCR.
- Observation 1:
  Additional interference mitigation techniques may be necessary, depending on the feasibility.
- Observation 2:
  Depending on the workload of other topics, actual specification work of RIS may be deferred to future releases.