3GPP TSG RAN Meeting #102
Edinburgh, Scotland, December 11 – 15, 2023

RP-233472

Scope on ISAC channel model

Agenda: 9.1.1.7
Document for: Discussion and decision
Source: Samsung

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Background

From RAN#101, the followings are summarized from moderator in RP-232617

Regarding ISAC, the following way forward seems agreeable:

1. If not already done in SID, a RAN-led study objective to select a small number of ISAC use cases from TR22.837, and to identify appropriate corresponding information needed for point 2 below, i.e. scenarios, frequency ranges and sensing modes.
2. A RAN1-led study objective to define channel modelling details for sensing using 38.901 (if applicable to the selected use cases) as a starting point, and taking into account relevant measurements, including:
   - modelling of sensing targets, including, for example (if needed by the selected use cases), radar cross-section (RCS), mobility and clutter/scattering patterns;
   - spatial consistency.

   This objective to start after completion of the first (RAN-led) objective if not already done in SID.

This documents discuss views on ISAC channel model study.

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Discussion points on ISAC channel model study

1. Whether to have RAN-led study

For channel model study, it is important to identify key use cases from the RAN perspective among the various use cases organized by SA. For more effective discussion from the perspective of project management, it is suggested phased approach to discuss the use cases, scenario, and spectrum in phase 1 in RAN, and remaining works in RAN1 as second phase.

2. Methodology for sensing channel model

In the end, the development of the channel model is to be used in simulation work, which means that it is important to develop a methodology for this purpose. Basically, TR38.901 is based on a stocastic model, so it is difficult to define an explicit sensing object, but the explicit method such as ray tracing is highly complex. Solutions to solve these problems are required and objective should be included.

3. How to validate model with measurement

Another question is what criteria will be used to determine whether the newly developed channel model aligns well with the measurement results after obtaining the measurement results. Therefore, it is necessary to look at the KPI for validation in SI and also to check how similar the measurement results and models are.

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Objectives

Based on our observations, we propose the following objectives

A RAN1-led study objective to define channel modelling details for sensing using TR38.901 (if applicable to the selected use cases) as a starting point, and taking into account relevant measurements, including:

[Phase 1]

- RAN to identifying use cases, deployment scenarios, frequency ranges, and sensing modes

[Phase 2]

- modelling of sensing targets and background environment, including, for example (if needed by the selected use cases), radar cross-section (RCS), mobility, and clutter/scattering patterns;
- developing methodology for channel modelling and model validation
  - for example of methodology, spatial consistency based stochastic model, ray tracing, or hybrid between ray tracing and stochastic
  - identifying validation KPIs
- validating sensing channel models and measurement results

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