

3GPP TSG RAN Rel-19 workshop

RWS-230146

Taipei, June 15 - 16, 2023

Agenda item: 5. Specific RAN1/2/3-led Rel-19 topics

# Integrated Sensing and Communication (ISAC)

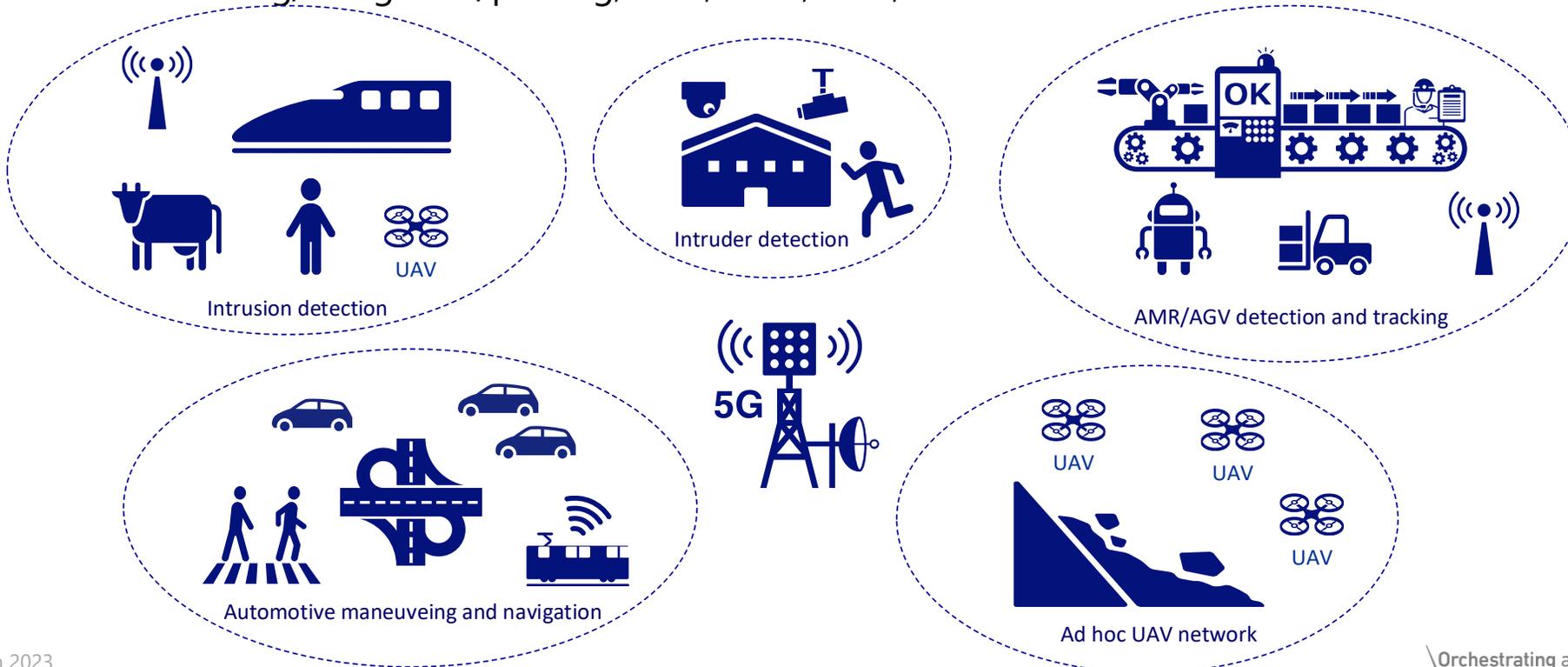
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# Motivation for ISAC

- ◆ **ISAC (Integrated Sensing And Communication)** is considered a promising feature in Rel-19 and 6G study, as sensing function can greatly enhance the network application scenarios, e.g., V2X, UAVs, smart city, smart home, factories, healthcare, and maritime sector.
- ◆ Combined sensing function with communication, it may collect types of sensor data (including non-3GPP information) and further provide service enhancement for the network.
- ◆ SA1 will finish the ISAC study item (TR 22.837) in 2023/6. RAN is expected to study the enabling technologies afterward.

# Overview of ISAC

- ◆ Among the multiple use cases described in TR 22.837, two types of applications have broader availability and should be with higher priority during Rel-19 discussion.
  - Intrusion detection
    - including detection of intruder, pedestrian/animal, UAV, etc.
  - Device detection and tracking
    - automotive maneuvering/navigation/parking, UAV, AMR, AGV, etc.



# Objectives for ISAC

- ◆ Start a study item for ISAC firstly from RAN level study on scenarios and requirements of sensing based on 3GPP network (V2X, UAV, positioning, target factor monitoring, etc.)
- ◆ On top of the RAN level study outcome, start a SI in RAN WGs
  - Study simulation model, channel model, and performance metric of ISAC system.
  - Study framework, mechanism, and procedure to support sensing function;
    - Discuss the Sensing Function entity and interface: independent SF with a new interface, SF embedded in LMF, and if SF with a direct interface to RAN, etc.
    - Discuss what is new to E1/F1/Xn/Ng interface and procedure by considering the sensing service.
  - Study resource schemes of sensing and communication;
    - Resource division/multiplexing between sensing and communication: TDM/FDM/SDM, etc.
  - Study and identify potential schemes of sensing;
    - Sensing type: Uu-based/sidelink-based sensing, active/passive sensing, single band or multiple bands, etc.
    - Sensing mode: gNB-to-UE, UE-to-gNB, gNB-to-gNB, UE-to-UE, UE transmitting and self-receiving, gNB transmitting and self-receiving, etc.
    - Sensing signal/waveform: combined with communication signal, non-OFDM signal, etc.

# Summary

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- ◆ ISAC is considered a promising feature, as sensing function can greatly enhance the network application scenarios.
- ◆ Following SA1 work on ISAC, RAN should start the study in Rel-19 including the following study scopes:
  - scenarios and requirements of sensing based on 3GPP network;
  - simulation model, channel model, and performance metric of ISAC system;
  - framework, mechanism, and procedure to support sensing function;
  - resource schemes of sensing and communication;
  - potential schemes of sensing;

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