**3GPP TSG SA WG 1 Meeting #104 S1-xxxxx**

**Chicago, USA, 13 - 17 November 2023**

**Source: Huawei**

**pCR Title: 22.137 pCR: Update to sensing security and privacy aspects**

**Draft Spec: 3GPP TS 22.137 v.1.0.0**

**Agenda item: 7.1.2**

**Document for: Approval**

**Contact: Fangyuan Zhu <zhufangyuan@huawei.com >**

*Abstract: This document proposes to update sensing security and privacy aspects of TS 22.137.*

**1. Introduction**

The clause of 4.1 and 4.2 both responsible for providing brief introduction about sensing services, including the purpose, basic theory and potential use cases of sensing (as illustrated in clause 4.1), and sensing operation process (as described in clause 4.2). However the following contents in clause 4.1 show potential security requirements of sensing service rather than giving introduction of sensing service:

|  |
| --- |
| *‘There is a need to protect the sensing data from unauthorized access, interception and eavesdropping, but also to make sure there is compliance with regulation and user awareness.’* |

Considering the clause 4.3 is the dedicated clause for privacy aspects , this pCR proposes to reformulate the clause 4.3 to specify both security and privacy aspcets about sensing services, by including the above security related contents.

This contribution updates the following descriptions in clause 4.3:

|  |
| --- |
| *The introduction of sensing capabilities can enable tracking and potentially identification of people and objects in the environment, including people not carrying UEs. Thus, additional considerations are needed to protect their rights to privacy.* |

The underlying meaning and assumption of “identification of people and objects” is unclear and overly broad, including the following:

1. identifying an identity of people, including people not carriying UEs: In this case, identifying an identity of people could violate their privacy, as an individual’s identity may not be hold by 3GPP. It is unclear whether sensing can truly obtain such kind of identity, but the statement itself imply that there is a feasaiblity and then associated risk.
2. identifying an object type among mutilple candidate object types, such as car, human or animal: In this case, there may not have much security or privacy issue if an object type is identified.

This contribution also resolves the following EN under clause 5.2.1.

|  |
| --- |
| *The 5G system shall be able to provide sensing service to detect, identify and/or track one or more objects (e.g., UAVs, birds) and the environment around the object(s).**Editor’s note: “Identify” is FFS.* |

**2. Reason for Change**

This pCR proposes to update sensing security and privacy aspects of TS 22.137.

**3. Proposal**

It is proposed to agree the following changes to 3GPP TS 22.137.

\* \* \* First Changes \* \* \* \*

## 4.1 General

5G wireless sensing is a technology enabler to acquire information about characteristics of the environment and/or objects within the environment, that uses radio frequency to determine the distance (range), angle, or instantaneous linear velocity of objects, etc.

Radio frequency sensing functionality provides services for device-free object localization as there is lack of need for the object to be connected via a device in the network. The estimation of parameters such as signal strength, delay, doppler and angle spectrum information is obtained from scattered and reflected radio frequency signals transmitted and received by RAN nodes or UEs by using NR radio frequency signals which, in some cases, previously defined information available in EPC and/or E-UTRA can be used, without leading to impacts on EPC and E-UTRA. By processing these radio frequency signals, features such as the location, velocity, geometric information of the objects can be extracted and further exposed together with contextual information towards different applications.

The capabilities to obtain range, velocity, and angle information from the radio frequency signals can provide a broad range of new functionality, such as various objects detection, object recognition (e.g., vehicle, human, animal, UAV) and high accuracy localization, tracking and activity recognition.

This technical specification describes the sensing technology as part of the 5G system for enabling new services and use cases. 5G wireless sensing service provides new possibilities for enhanced usage of the telecommunication infrastructure. It provides input to different verticals (i.e., UAVs, smart home, V2X, factories, railways, public safety, etc) enabling applications offering e.g., intruder detection, assisted automotive maneuvering and navigation, trajectory tracing, collision avoidance, traffic management, health and activity monitoring.

In some cases, 5G wireless sensing can also use non-3GPP type sensors (e.g., Radar, camera) to further support the 3GPP-based sensing.

5G wireless sensing service also brings challenges related to confidentiality and privacy.

\* \* \* Second Changes \* \* \* \*

## 4.3 Sensing security and privacy aspects

The 5G system s

The introduction of sensing capabilities can enable tracking objects in the environment. Thus, additional considerations are needed to protect their rights to privacy.

\* \* \* Third Changes \* \* \* \*

### 5.2.1 General

The 5G system shall be able to provide sensing service to detect, and/or track one or more objects (e.g., UAVs, birds) and the environment around the object(s).

Based on operator’s policies, operator’s control and regulation, the 5G system shall be able to collect 3GPP sensing data from sensing receivers for processing.

The 5G system shall be able to provide 5G wireless sensing service in a target sensing service area location using sensing transmitters and sensing receivers.

Subject to regulation and operator policy, the 5G network shall be able to activate, configure, and deactivate 5G wireless sensing based on parameters such as location and network conditions (e.g., network load).

Subject to user consent, regulation, and operator’s policy, the 5G system shall be able to collect non-3GPP sensing data from authorized non-3GPP sensors and securely provide it to 5G network.

Subject to user consent, regulation, and operator’s policy, the 5G system should support the joint processing of the 3GPP sensing data and non-3GPP sensing data to derive a combined sensing result.

The 5G system shall support continuity for 5G wireless sensing service (e.g., for sensing a moving object).

Subject to operator’s policy, the 5G System shall be able to provide the 5G wireless sensing service in case of roaming.

Subject to regulation and operator’s policy, 5G network shall provide prioritization among 5G wireless sensing services as well as prioritizing between communication and sensing services.

The 5G network shall enable UEs without 5G coverage to use unlicensed spectrum to provide 5G wireless sensing service.

Subject to regulation, the 5G network shall enable UEs supporting V2X application to perform 5G Wireless sensing when not served by RAN using the allowed ITS spectrum and unlicensed spectrum.

\* \* \* End of Changes \* \* \* \*