**3GPP TSG-SA2 Meeting #170S2-2507803**

**Goteborg, Sweden, 25th Aug 2025 – 29th Aug 2025** *is a revision of S2-2506357*

**Source: CEWiT, KPN N.V**

**Title: Solution for KI#5 on Sensing Result Exposure for 5GA**

**Document for: Approval**

**Agenda Item: 20.2.1**

**Work Item / Release: FS\_Sensing\_ARC / Rel-20**

*Abstract: The contribution proposes a solution for Key Issue #5: Sensing Result Exposure*

1. Introduction

This paper presents a solution that enables the 5G System (5GS) to support the exposure of the computed Sensing Results.

1. Text Proposal

It is proposed to agree the following changes in 3GPP TR 23.700-14.

# 6 Solutions

## 6.0 Mapping of Solutions to Key Issues

Table 6.0-1: Mapping of Solutions to Key Issues

|  |  |
| --- | --- |
|  | **Key Issues** |
| **Solutions** | **1** | **2** | **3** | **4** | **5** | **6** |
| **#X** |  |  |  |  | **X** |  |

*\* \* \* \** Start of Changes \* \* \* \*

1. 6.X Solution #X: Sensing Result Exposure for 5GA
2. 6.X.0 High-level Solution Principles

For the Sensing feature to be supported in the network, a NF namely "SeMF (Sensing Management Function)" is introduced to control and manage sensing service operations.

The SeMF can receive requests and expose the computed Sensing Results to,

- AF(s) authorized by NEF, allowing the AF(s) in the trusted domain to leverage real-time sensing information.

- AF(s)in Core network

1. 6.X.1 Description

The proposed solution addresses Key Issue #5 on Sensing Result Exposure. It describes the procedure for Sensing Result Exposure along with the key parameters present in the sensing exposure request and response.

### 6.X.1.x Sensing Result Exposure

The following attributes may be present in the request of the sensing service consumer:

- AF ID

- Sensing Correlation ID (for Periodic and Event-Triggered)

- Target Sensing Area

 - Supported GAD shapes

 - Cell ID(s), Tracking Area

 Editor's Note: It is FFS if the Tracking area definition for sensing would be redefined.

 - Reference Co-ordinates

 - Azimuth / Horizontal

 - Zenith / Vertical

 - Reference Co-ordinate system (Universal, Cartesian)

 - Distance

 - Angle

- Sensing Service Type(s) (Object Detection, Object Localization, Object Tracking etc.,)

- Sensing Time Window(s)

- Object Definition: Parameters defining the object(s) to be sensed.

- Object(s) dimensions

- Object(s) status i.e. Stationary, Moving

- Object Characteristic Type

 - Object Properties (e.g. RCS value of interest, metallic object, aerial object etc.)

 - Object Filter Type (e.g. Human, metallic object (small/large), vehicle (small/large), Aerial etc.)

Editor’s Note: The listed Object Properties and Object Filter Types are just examples. It is subject to RAN inputs.

Editor’s Note: All Object definition related parameters are subject to RAN inputs and is FFS.

- Object(s) Velocity

- Azimuth / Horizontal

- Zenith / Vertical

Editor’s Note: The sub-categorization of object velocity is FFS and is subject to RAN inputs.

- Type of Event Reporting

- One time, Periodic, Event Triggered

- Maximum number of Event Reports

Note: There can be few events as listed e.g. detection of an object, defined by the network based on which the report could be generated by Sensing Entity

- Duration of Event Reporting

- Quality Indication of Sensing Result

 - Expected Confidence of Sensing Result

 - Expected Accuracy of Sensing

Editor’s Note: The details about how the confidence and accuracy of sensing result will be defined and calculated is FFS.

- Sensing Result Response Time i.e., expected sensing response time.

The following attributes may be present in the sensing service response:

- Object Presence Detection i.e., Yes or No

- Sensed Object count

- Sensed Object definition

- Object ID(s)

- Object Characteristic Type

 - Object Properties (e.g. RCS value of interest, metallic object, aerial object etc.)

 - Object Filter Type (e.g. Human, metallic object (small/large), vehicle (small/large), Aerial etc.)

Editor’s Note: The listed Object Properties and Object Filter Types are just examples. It is subject to RAN inputs and FFS.

Editor’s Note: All Object definition related parameters are subject to RAN inputs and is FFS.

- Object(s) status i.e. Stationary, Moving

- Dimensions of sensed object(s)

- Sensed Object(s) Location

 - Supported GAD shapes

 - Cell ID(s), Tracking Area

Editor's Note: It is FFS if the Tracking area definition for sensing would be redefined.

 - Reference Co-ordinates

 - Azimuth / Horizontal

 - Zenith / Vertical

 - Reference Co-ordinate system (Universal, Cartesian)

 - Distance

 - Angle

- Quality Indication of Sensing Result

 - Confidence of Sensing Result

 - Accuracy of Sensing

Editor’s Note: The details about how the accuracy of sensing result is defined and calculated is FFS.

- Velocity of sensed object(s)

- Azimuth / Horizontal

- Zenith / Vertical

Editor’s Note: The sub-categorization of object velocity is FFS and is subject to RAN inputs.

- Time Stamp of Sensing measurement information

### 6.X.2 Procedures

The following procedure as in Figure 6.X.2-1 provide architecture support for sensing result exposure.



**Figure 6.X.2-1: Procedure to support Sensing Result Exposure**

1. The request for a sensing service may come from an untrusted AF authorized by NEF or AF in the trusted domain.

 1a-1. An untrusted AF sends a request to the NEF by invoking the Nnef\_SensingExposure\_Subscribe service. The request may include the AF ID and other parameters as listed above.

 1a-2. The NEF authorizes the request from the AF and performs SeMF selection and discovery either based on local configuration or by querying the NRF based on the parameters in AF request. To the selected SeMF, the NEF invokes the Nsemf\_Sensing request service carrying the AF request.

1b. Trusted AF performs SeMF selection and discovery either based on local configuration or by querying the NRF. To the selected SeMF, the AF invokes the Nsemf\_Sensing request service. The request may include the parameters as listed above.

Editor’s Note: The SeMF selection procedures are handled as part of KI#3.

2. Based on the sensing area and other parameters in the request, the SeMF authorizes the sensing request.

After successful authorization of the sensing request, the SeMF performs Sensing Entity(SE) selection. SeMF interacts with the chosen Sensing Entity and initiates the Sensing process. SeMF collects sensing measurement data from the Sensing Entity. Using the collected data, the sensing result is computed by the SeMF.

Editor’s Note: The sensing measurement data collection procedures and Sensing Entity Selection procedures are handled as part of KI#4 and KI#3 respectively.

Editor’s Note: The interaction between the SeMF and SE for Sensing data collection is FFS.

3. Based on the request received in step 1, the SeMF reports the sensing results to the requesting entity either to untrusted AF through NEF as in step 3a1 and 3a2, or to Trusted AF as in step 3b. The report contains parameters as listed above.

### 6.X.3 Impacts on Services, Entities and Interfaces

The following impacts may be present in the following entities for sensing result exposure,

SeMF:

- Support for sensing request processing and sensing result exposure to AF.

NEF:

* Support sensing request processing and result exposure to authorized AF(s).

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