**3GPP TSG SA WG2#170 S2-2507176r01**

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**Source: Lenovo, Futurewei, China Telecom**

**Title: Solution for KI#2&3 Sensing Entity reselection/sensing service revocation**

**Document for: Approval**

**Agenda Item: 20.2.1**

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*Abstract of the contribution: Proposes new solution for KI#2&3 Sensing Entity Reselection/Sensing service revocation*

1. Introduction

This pCR proposes the solution for Key issue#2 Authorization and Revocation of sensing service request and Key Issue#3 Sensing Entity and Sensing Function Discovery and (Re-)Selection.

2. Text Proposal

It is proposed to capture the following changes in TR 23.700-14.

\* \* \* \* First change \* \* \* \*

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** | **X** |  |  |  |

6.X Solution #X: < Sensing Entity reselection/sensing service revocation>

6.X.0 High-level solution Principles

The high-level principles for Sensing Entity reselection/sensing service revocation are:

* Define Sensing Non-allowed Area
* Sensing Entity request Sensing Function to pause/revoke the sensing task with cause value of 1) the sensing object is within the Sensing Non-Allowed Area, 2) the sensing object is moving out of its coverage
* Sensing Function determines to pause/revoke the sensing service, or reselect Sensing Entity

6.X.1 Description

Based on regulatory requirements, sensing may not be allowed in some places, e.g., Government office, Military restricted area etc. Therefore, we define Sensing Non-Allowed Area as follows,

**Sensing Non-Allowed Area**: An area where Sensing Entity is not allowed to initiate the sensing operation.

The Sensing Non-Allowed Area information can be in the form of cell level, which includes a set of cell ID or Tracking Area Code (TAC) etc. Alternatively, they can be in the form of geographical area. For gNB-based sensing, the sensing RAN node is generally fixed and static. Meanwhile, sensing object (e.g., UAV) may be mobile, which may move into the Sensing Non-Allowed area. Upon detection of sensing object is within the Sensing Non-Allowed Area, the Sensing RAN node may request to pause/revoke the sensing task. Besides, the Sensing RAN node may request to pause/revoke the sensing task if the sensing object moves out of its coverage.

NOTE: the Sensing Non-Allowed Area can be preconfigured/configured at the sensing RAN node by OAM or SF respectively. Besides, the Sensing Non-Allowed Area can be preconfigured by OAM or provided by the 3rd Party AF at the SF side. If the Sensing Non-Allowed Area is provided by the 3rd party AF, then it may only be applied for the sensing service triggered by the 3rd party AF.

6.X.2 Procedures

#### 6.X.2.1 Procedures for Sensing Entity reselection/sensing service revocation



Figure 6.X.2.1-1: Sensing Entity reselection/sensing service revocation procedure

1. Sensing RAN node sends sensing association request to the SF, which includes RAN node ID and sensing capability information. It is assumed that Sensing RAN node obtains SF information by pre-configuration or from AMF. Sensing capability information may include supported sensing mode, supported accuracy of sensing, confidence level, sensing resolution, false alarm probability, missed detection probability, refreshing rate, max sensing service latency, Tx/Rx support indicator etc.
2. SF sends sensing association response message to the sensing RAN node, which may include the Sensing Non-Allowed Area information. The Sensing Non-Allowed Area information may be preconfigured in SF or provided by the 3rd party AF in advance.
3. AF/NEF sends Sensing Service Request message to the SF, which includes sensing task ID, target sensing area, sensing requirement and sensing exposure requirement etc. Sensing requirement may include sensing accuracy, sensing resolution, confidence level, missed detection probability, false alarm probability, max sensing service latency, refreshing rate etc. Sensing exposure requirement may include notify method (e.g., one time, periodic or event trigger), reporting periodicity, waiting time etc. Besides, the Sensing Non-Allowed Area information may also be provided by 3rd party AF.
4. SF triggers sensing task assignment procedure towards the selected sensing RAN node. E.g., SF may send sensing task assignment request message to the sensing RAN node, which includes sensing task ID, sensing mode and sensing requirement. Besides, the request message may also include the Sensing Non-Allowed Area information if not provided in step 2. Alternatively, it is assumed that the sensing RAN node is preconfigured with the information by OAM.
5. After sensing task assignment, SF sends Sensing Service Notify/Response message to AF/NEF.
6. The sensing RAN node performs the sensing task. The sensing RAN node determines if the sensing object is within Sensing Non-Allowed Area or is out of its coverage based on the sensing measurement data.

NOTE: How the sensing RAN node makes the determination depends on implementation, e.g., when determining whether the sensing object is out of its coverage, the sensing RAN node may compare the sensing reflected signal strength with a threshold. When determining whether the sensing object is within the Sensing Non-Allowed Area, the sensing RAN node may determine the location of the sensing object based on its own location and the sensing measurement data.

1. The sensing RAN node sends request to pause/revoke the sensing task to the SF, which includes sensing task ID and cause value. E.g., cause value can be the sensing object is within Sensing Non-Allowed Area, or the sensing object is out of coverage or other reasons. Within Sensing Non-Allowed Area means the sensing object is within the Sensing Non-Allowed Area.

Alternatively, the sensing RAN node may determine to pause/revoke the sensing task and inform SF instead.

1. Upon receiving the request from the sensing RAN node, the SF determines to pause/revoke the sensing task or reselect a new Sensing Entity. E.g., if the cause value#1 is that sensing object is within Sensing Non-Allowed Area, the SF may determine to pause/revoke the sensing task. If the cause value#2 is that sensing object is out of coverage, the SF may determine to reselect a new Sensing Entity.
2. SF sends sensing task ID and sensing pause/revoke indication to the sensing RAN node. For cause value#2, SF sends sensing task ID and sensing revoke indication to the sensing RAN node. Besides, SF triggers sensing task assignment procedure towards the new Sensing Entity. In this case, no step 10.
3. Optionally, SF sends sensing task ID and revoke indication to AF/NEF.

6.X.3 Impacts on services, entities and interfaces

AF/NEF:

- provides the Sensing Non-Allowed Area information to SF

SF:

- provides the Sensing Non-Allowed Area information to sensing RAN node

- receive the request to pause/revoke the sensing task with cause value form the sensing RAN node. determine to pause/revoke the sensing task or reselect a new Sensing Entity based on the cause value.

Sensing RAN Node:

- receives the Sensing Non-Allowed Area information from SF or being preconfigured by OAM

- request to pause/revoke the sensing task

\* \* \* \* End of changes \* \* \* \*