**3GPP TSG-SA WG1 Meeting #98e S1-draft221100**

**Electronic Meeting, 9 – 19 May 2022** *(revision of S1-22xxxx)*

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**pCR Title: Pseudo-CR on use case of security for non-N2 sharing network**

**Draft Spec: 3GPP TR 22.851**

**Agenda item: 7.5**

**Document for: Approval**

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*Abstract: This clause describes the sharing scenarios and potential security requirements for non-N2 sharing network in TR22.851*

**1. Introduction**

The use case of non-N2 sharing network is an important use case in the network sharing. The contribution describes the use case and potential requirements of security for non-N2 sharing network scenario.

**2. Reason for Change**

Update the “Use Cases” section 5 of the new TR 22.851.

**3. Conclusions**

It is proposed to put the use case into the TR 22.851.

**4. Proposal**

It is proposed to agree the following changes to 3GPP TR 22.851.

\* \* \* First Change \* \* \* \*

## 5 Use cases

## 5.A Use case of security

### 5. A.1 Description

If the connection between radio access network and home core network is not always available., it is inevitable to use connection between operators to achieve interoperability. In order to avoid increasing technical complexity, the principle is to avoid modifying more new interfaces, which makes it easier for operators to reach an agreement on network interconnection. However, there is a need to consider information security between different networks.

### 5. A.2 Pre-conditions

It is assumed that:

1. OP 1 is the Hosting RAN operator of 5G NR access network.

2. the OP1’s 5G network is allowed to be shared within some area.

3. UE belongs to OP 2 as Participating Operators.

4. 5G access network of OP1 does not have N2 connection with the core network of OP 2.

### 5. A.3 Service Flows

OP 1

5G Network

topology hiding

UE of OP2

OP 2

5G Network

topology hiding

UE of OP2

UE moves between OP2 and OP1

Figure 5.A.3-1: Non-N2 shared network security scenario

It is assumed that Hosting RAN operator and Participating Operator have supported the mobility between the two operator’s network, then:

1. UE moves from OP2’s network to the shared network of OP1 with or without services;

2. Some information about relative elements may be transferred from OP2’s network to OP1’s network, serving for the UE’s movement, e.g. reselection or handover, which may not be the information of border elements between two operators’ network;

3. Both OP1’s network and OP2’s network want the connection between networks to be under security protection when UE enters the shared coverage area;

4. UE returns to OP2’s network from the shared network of OP1 with or without services;

5. Some information about relative elements may be transferred from OP1’s network to OP2’s network, serving for the UE’s movement, e.g. reselection or handover, which may not be the information of border elements between two operators’ network;

6. Both OP1’s network and OP2’s network want the connection between networks to be under security protection when UE returns to the home network;

The necessary information of border element is transmitted between networks of Hosting RAN operator and Participating Operator to serve the normal network connection. At the same time, some non-border element information of one operator’s network may need to be hidden from another operator’s network.

For example, when the UE moves from shared network of OP1 to OP2’s network, with the information transmission of the non-border element of OP1’s shared network, such as the IP address, the OP1’s shared network need a way to hide the IP address and does not affect the service to the UE when moving to OP2’s network. This also occurs when the UE moves from OP2’s network to shared network of OP1.

Another example is the identification of the non-border element, e.g., the identification consists of number of the network element, need also a way to hide when UE moves from one operator’s network to another operator’s network.

### 5. A.4 Post-conditions

### 5. A.5 Existing feature partly or fully covering use case functionality

### 5. A.6 Potential New Requirements needed to support the use case

[PR 5.A.6-001] Network topology hiding shall be supported between the networks of Hosting RAN operator and Participating Operators when a user crosses the border of the shared network.

[PR 5.A.6-002] According to the operator's policy, the information of the network element, including IP address information and device identification, needs to be hidden.