**SA WG2 Meeting #S2-152E S2-2205804r01**

**17 - 26 Aug, 2022, E-Meeting**

**Source: Ericsson**

**Title: KI #4, KI #5, New Sol: Credential provisioning for access to hosting network**

**Document for: Agreement**

**Agenda Item: 9.4**

**Work Item / Release: FS\_eNPN\_Ph2 / Rel-18**

*Abstract of the contribution: This paper proposes a new solution to address the Key Issue #4 and Key Issue #5.*

# Discussion

This contribution proposes solution to address Key Issue #4 aspect:

*- How the UE is provisioned with credentials (if required) to access the selected localised services provided via the hosting network.*

Since it is usually assumed that UE may not have prior relationship with hosting networks which providing access to the localized services, it is important for UE to know what type of credential can be used to access hosting networks and how to obtain them.

For localized service user case, UE may have regular network credential (e.g. a credential from a PLMN operator). Hosting network can either allow access using this existing regular network credential, or require a separated credential for accessing hosting network. If separated credential is used, solution is required to address how UE to obtain such credential, and how to use the newly obtained credential.

This contribution also addresses Key Issue #5 aspect:

*- How home network determines the need to steer or instruct the UE, and how the home network steers or instructs the UE to select a hosting network for obtaining home network services or localized services or select a network for a specific service which is available from both hosting and home network.*

# Proposal

Add the following solution to TR 23.700-08.

\*\*\* BEGIN CHANGES \*\*\*

## 6.0 Mapping Solutions to Key Issues

Table 6.0-1: Mapping Solutions to Key Issues

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Key Issues | | | | | |
| Solutions | 1 | 2 | 3 | 4 | 5 | 6 |
| 1 | X |  |  |  |  |  |
| 2 |  | X |  |  |  |  |
| 3 |  | X |  |  |  |  |
| 4 |  | X |  |  |  |  |
| 5 |  | X |  |  |  |  |
| 6 |  | X |  |  |  |  |
| 7 |  |  | X | X | X | X |
| 8 |  |  |  |  |  | X |
| 9 |  |  |  |  |  | X |
| 10 |  |  |  | X |  | X |
| 11 |  |  |  | X | X |  |
| 12 |  |  | X | X |  |  |
| 13 |  |  |  | X | X |  |
| 14 |  |  |  | X |  |  |
| 15 |  |  |  | X | X |  |
| 16 |  | X |  |  |  |  |
| 17 |  |  |  |  |  | X |
| 18 |  |  |  |  | X |  |
| 19 |  | X |  |  |  |  |
| 20 |  | X |  |  |  |  |
| 21 |  | X |  |  |  |  |
| 22 |  |  | X |  |  |  |
| 23 |  |  |  | X |  |  |
| 24 |  |  |  | X |  |  |
| 25 |  |  |  | X |  |  |
| 26 |  |  |  | X |  |  |
| 27 |  |  |  | X | X |  |
| 28 |  |  |  | X | X |  |
| 29 |  |  |  | X |  |  |
| 30 |  |  |  | X |  |  |
| 31 |  |  |  | X |  |  |
| 32 |  |  |  | X |  |  |
| 33 |  |  |  | X |  |  |
| 34 |  |  |  | X |  |  |
| 35 |  |  |  |  | X |  |
| 36 |  |  |  |  | X |  |
| 37 |  |  |  |  | X |  |
| 38 |  |  |  |  |  | X |
| 39 |  |  |  |  |  | X |
| X |  |  |  | X | X |  |

\*\*\* NEXT CHANGES \*\*\*

## 6.x Solution #X: Credential provisioning for accessing hosting network

### 6.X.1 Introduction

This solution addresses the Key Issue #4 aspect regarding how UE is provisioned with credential to access hosting network, and the Key Issue #5 aspect regarding how home network to steer UE to the hosting network.

This solution covers the function described in solution #7 step H4 and step H5.

### 6.X.2 Functional Description

Based on the principle of User Plane Remote Provisioning mechanisms specified in TS 23.501 [3] clause 5.30.2.10.4.4, this solution enables the provisioning of hosting network credentials to UE.

This solution assumes hosting network is SNPN.

UE is assumed to have regular network credential(s) from a home network (e.g. a credential from a PLMN operator) and is currently registered in a serving network which can be the home network itself, or another network that UE is using home network credential to access.

UE is also assumed to be provisioned with information related localized service, such as which hosting networks can provide access to the desired localized service. The solution for provisioning localized service information is addressed by other solutions.

### 6.X.3 Procedures



Figure 6.X.3-1 Credential provisioning for accessing hosting network

0. UE registers in a serving network using home network credential.

1. UE is provisioned with information related localized service, such as which hosting networks can provide access to the desired localized service (e.g. Solution #24), credential related information (e.g. PVS address, etc) of the hosting networks for accessing localized service, and at the same time provisioned with network capability to support User Plane Remote Provisioning of credential for accessing hosting network.

2. End user makes a selection of one or more specific hosting network(s) to access the desired localized service, or one or more specific localized service. The UE initiates the PDU Session Establishment procedure for remote provisioning of credential related information (e.g. PVS address, etc).

3. Along with a PDU Session Establishment procedure, UE can request for credential related information (e.g. PVS address, etc) of the hosting networks for accessing localized service if it is not already provisioned.

The UE's request of credential related information includes one or more identifier(s) of the selected hosting network(s), and/or one or more identifier(s) of the selected localized service(s).

The UE's request can be either as part of the UL NAS Transport message or inside the PDU Session Establishment Request message which is the payload container of the UL NAS Transport message.

4. PDU Session Establishment is accepted by SMF.

AMF or SMF has a locally configured mapping table between [Credential Information] and [Hosting network identifier] for a specific localized service. AMF or SMF can return the corresponding [Credential Information] to the UE, based on UE's request and the configured mapping table.

Whether it is AMF or SMF to return the [Credential Information] to UE, depends on if the UE's request is part of UL NAS Transport message, or is inside the PDU Session Establishment Request message.

The [Credential Information] associated with one hosting network in the mapping table consists of:

- Indication of whether home network credential can be used as CH credential, in case the serving network is the home network;

- FQDN or IP address of the PVS;

- The type of the credential that is provided by the PVS:

1) Native credential, which is used to access the hosting network SNPN directly;

2) Default UE credential, which is used to perform onboarding procedure with the hosting network SNPN.

UE can request network to return all available hosting network's credential information for the desired localized service, by specifying the localized service identifier in the request.

5. UE connects to the PVS for remote provisioning of credential, and stores information associated with the newly obtained credential, e.g. the corresponding hosting network, the type of the credential, etc. If home network credential can be used as CH credential to access the hosting network SNPN, this step can be omitted.

If home network credential can be used as CH credential to access the hosting network SNPN, automatic network selection can be applied.

6. The UE initiates the de-registration procedure. If the selected localized service(s) are about to start (or have started), the UE needs to select the hosting network.

If the serving network is home network, the redirection to hosting network can be triggered as below:

- The UE includes in the de-registration request the identifier of the selected hosting network for accessing a localized service, or

- The UE indicates in the de-registration request message with cause "redirection is requested", in case in step 3 only single hosting network identifier is requested by UE and the request is handled by AMF

After de-registration accept, the AMF informs the NG-RAN via NGAP about the selected hosting network identifier, e.g. as new IE in the UE CONTEXT RELEASE COMMAND for that UE. If the NG-RAN is aware of neighboring cells within the UE’s selected hosting network identifier, the NG-RAN assists the UE in finding the hosting network by sending an RRC release with redirect message (frequency and optionally cell information) or RRC release with multiple frequencies to the UE.

- If the UE does not receive any redirect information in the RRC release message, the UE performs cell/network search to find/select the hosting network.

### 6.X.4 Impacts on services, entities, and interfaces

UE:

- Request Credential information by indicating the selected hosting network(s) or selected localized service(s).

- Use the obtained credential based on the associated type to access hosting network.

- Indicate to the network during de-registration a redirection to hosting network is preferred.

AMF/SMF:

- Configure the mapping of [Credential Information] and [Hosting network identifier] for specific localized service

- Respond to UE with proper [Credential Information] associated with a hosting network SNPN.

AMF/RAN:

- Redirect the UE to hosting network based on the input from UE.

\*\*\* END CHANGES \*\*\*