**SA WG2 Meeting #162S2-2405201**

**Changsha China, April 15th–April 19th, 2024 (revision of S2-2404547)**

**Source: Nokia**

**Title: Solution for KI#1: Single Active registration with the Network**

**Document for: Approval**

**Agenda Item: 19.8**

**Work Item / Release: FS\_UIA\_ARC / Rel-19**

*Abstract of the contribution: solution addressing KI#1*

# 1 Discussion

This document describes a solution that addresses KI#1 scenarios.

Let us take the below example.

* UE Subscription – Father (UE subscription.)
* User 1 – Daughter (User Identity Profile)
* User 2 – Son (User Identity Profile)

In the above example, following scenarios may exist:

* UE Subscription (and no User Identity Profile) is registered, and then a user logs into the UE with User 1.
* User 1 is logged in and registered, and User 1 logs out.
* User 1 is logged in and registered, and User 2 logs in.

As shown in the scenarios and illustration, when an associated user profile (of the UE) registers, the UE is deregistered. However, the UE Subscription being the prime user of the UE, it is expected that the UE Subscription to re-use the UE after some period which then encourages to maintain the context of the UE (during switching of user profile).

This paper provides a solution to cater to these scenarios as explained above, to ensure that always only one amongst Father, Daughter, or Son (as in the above example) use the network actively at any given time.

# 2 Proposal

It is proposed to update TR 23.700-32 as follows.

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

## 6.0 Mapping Solutions to Key Issues

Table 6.0-1: Mapping Solutions to Key Issues

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Solutions |  |  | | |
|  | <Key Issue #1> | <Key Issue #2> | <Key Issue #3> | <Key Issue #4> |
| #1 | X | X | X |  |
| #2 | X |  |  |  |
| #3 | X | X |  |  |
| #4 | X |  |  |  |
| #5 | X | X |  |  |
| #6 | X |  |  |  |
| #7 | X |  |  |  |
| #8 |  | X |  |  |
| #9 |  | X |  |  |
| #10 |  | X | X |  |
| #11 |  | X | X |  |
| #12 |  | X | X |  |
| #13 |  | X |  |  |
| #14 |  | X |  |  |
| #15 |  |  | X |  |
| #16 |  |  | X |  |
| #X: | X |  |  |  |

\* \* \* \* Next change (All new text) \* \* \* \*

## 6.X Solution #X: Transition of states when different User(s) or UE Subscription uses the UE for Network Access.

### 6.X.1 Introduction

This solution addresses KI#1 related to WT.

### 6.X.2 Functional Description

The principles related to secure fetch of User Identities from the UE, Authentication and Authorization remains same as detailed in Solution 10. Hence below sections do not repeat these aspects, for better readability and clarity and thus confines to the problem statement that the solution is addressing.

**Brief of the sequence of events in the solution:**

This solution allows easy transition from one User Identity Access (or UE Subscription) to other registering User Identity (or UE Subscription) as Active, while also maintaining the context of transitioned User Identity for certain period.

### 6.X.3 Procedures

#### 6.X.3.1 Access by different User Identities (or UE Subscription)



Figure 6.X.3-1: Procedure for transitioning from one User Identity or UE Subscription to Other User Identity or UE Subscription.

Step 1-2: UE Subscription registers to the network with or without the User Identity. AMF maintains the corresponding UE Subscription or User Identity as ACTIVE.

Step 3: The AMF and UE may maintain the last registered contexts and states of User Identity Profiles for a specified period.

Step 4: When the UE initiates a new registration request or optionally with a mobility and registration update request with a different User Identity (or without User Identity), the AMF shall authenticate the subscription validity of the corresponding User Identity.

Step 5: AMF at UDM/UDR maintains the state of the UE Subscription or User Identity of the previous registration. This action changes the state of the User Identity Profile of the previous registration to INACTIVE state, while registering the User Identity Profile (or UE Subscription) to ACTIVE state. This INACTIVE state of the previous User Identity Profile may be time bound and if not re-activated within the time frame, the corresponding context is purged.

When the UE Subscription tries to register (as in step 4), the context which is available shall be used.

Step 6: AMF shall indicate DEREGISTER LITE cause in NAS to the UE as part of the Registration Accept.

Step 7-7a. Clearing of Sessions and context at other NF, such as SMF and UPF.

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

UE:

* UE implements receiving of DEREGISTER LITE indication when the registration of a new User Identity Profile is done.

AMF:

* Maintaining of ACTIVE or INACTIVE state of the UE and User Identity Profiles.
* Switching from one User Identity Profile to another. (or to from a UE Subscription alone).
* When UE re-logs in, fetches the context of the UE and use it instead of creating the context again.

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