**3GPP TSG-SA WG1 Meeting #99e S1-222014draft1**

**Electronic Meeting, 22 August – 01 September 2022** *(revision of S1-22xxxx)*

**Source: Deutsche Telekom, Ericsson**

**pCR Title: Pseudo-CR on SoR during registration use case**

**Draft Spec: 3GPP TR 22.877 V0.0.0**

**Agenda item: 7.10**

**Document for: Approval**

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**1. Introduction**

This contribution proposes the use case on SoR during registration procedure.

**2. Reason for Change**

The use case on SoR during registration procedure was agreed in the objectives in the study item to be one of three use cases for the study.

**3. Proposal**

It is proposed to agree the following changes to 3GPP TR 22.877.

# 2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non‑specific.

- For a specific reference, subsequent revisions do not apply.

- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

[1] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications".

[2] 3GPP TS 22.011: "Service Accessibility".

# 5 Use cases

## 5.1 Welcome SMS use case

### 5.1.1 Description

### 5.1.2 Pre-conditions

### 5.1.3 Service Flows

### 5.1.4 Post-conditions

### 5.1.5 Existing feature partly or fully covering use case functionality

### 5.1.6 Potential New Requirements needed to support the use case

## 5.2 Steering of Roaming (SoR) during the registration procedure use case

### 5.2.1 Description

HPLMNs can steer their subscribers to preferred partner networks in case of roaming by means of issuing commands and updating the Operator Controlled PLMN Selector list on the USIM, either by using SMS or via signalling, as defined in TS 22.011 [2].

Additionally, for more short-term balancing of distribution across VPLMNs, operators use mechanisms to reject registration attempts from some share of UEs to certain VPLMNs to make them select a different VPLMN.

Both mechanisms – SoR as defined in 3GPP and the here described SoR during the registration procedure – can be applied in parallel by a HPLMN.

This use case describes how the home operator identifies that a roaming user attempts to register in a new network and triggers the sending of reject messages to the UE, resulting in the UE attempting to register to another VPLMN. The details of how often a reject is sent to a particular UE to achieve the desired result and to prevent the UE from being without a network, are left to the application server and not described here.

### 5.2.2 Pre-conditions

Users X and Y have a subscription with operator HPLMN1.

Both users X and Y are travelling to another country, where two networks are available – VPLMN1 and VPLMN2. Both networks have a roaming agreement with HPLMN1.

VPLMN1 has a higher priority for both users.

### 5.2.3 Service Flows

Users X and Y arrive at the country and switch on their phones. According to existing procedures both UEs select VPLMN1 as their first choice for registration and try to register on that network.

VPLMN1 forwards the registration request messages of the UEs of users X and Y to the HPLMN1.

HPLMN1 recognises the registration attempts and invokes the steering service via a northbound API. The steering service, hosted by the HPLMN or some trusted 3rd party, decides if some steering action is needed for any of the UEs.

In this use case it decides to allow the UE of user X to register on VPLMN1 whereas user Y’s UE should not use VPLMN1.

The steering service triggers the steering action using the northbound API for user Y’s UE, which results in a reject message being sent to this UE, including an appropriate reason for the rejection. The registration process for user X’s UE is not affected.

### 5.2.4 Post-conditions

While the UE of user X successfully registered to VPLMN1 the UE of user Y selects VPLMN2 as the only other available network and registers there.

If more than one remaining VPLMN is available the UE picks one of them according to network selection procedures. The process of rejecting could be repeated as needed.

5.2.5 Existing feature partly or fully covering use case functionalityRegistration to networks and rejecting registration attempts with different information corresponding to the reason for rejection, causing the UE to search for other networks.

### 5.2.6 Potential New Requirements needed to support the use case

The 3GPP network shall be able to provide notifications via a northbound API in the home network to a steering service hosted by the home operator or a trusted 3rd party about UEs trying to register to new PLMNs.

The 3GPP network shall have a northbound API to enable the steering service to trigger rejecting registration attempts to cause the UE to search for another network to register on.

The Steering of Roaming (SoR) during the registration shall not require any changes to the UE, e.g., the information given to the UE during reject shall be be understandable for legacy (i.e. pre-Rel-19) UEs.

## 5.3 IMSI based routing to a particular core network use case

Editor’s Note: use the same headers as used in use case 5.1