**3GPP TSG-SA3 Meeting #110 *S3-23xxxx***

**Athens, Greece, 20 - 24 February 2023** (revision of S3-yyxxxx)

**Source: Huawei, HiSilicon**

**Title: Way forward for KI#1**

**Document for: Endorsement**

**Agenda Item: 5.12 FS\_eNS\_Ph3**

# 1 Decision/action requested

***Endorse the proposals regarding KI#1 in TR33.886***

# 2 References

[1] S2-2210683 FS\_eNS\_Ph3 Status Report after SA2#154

[2] TR 23.700-41 v2.0.0

# 3 Rationale

This contribution is to propose the way forward based on the latest progress in SA2 [1][2] and, in particular, the conclusions related to the KI#1 of TR33.886.

## 3.1 Progress in SA2

* **SA2’s study on eNS3 is completed.** All issues were concluded as documented in TR23.700-41 v2.0.0. **The WID** based on those conclusions was also **approved in Dec 2022.**
* **The conclusions** for SA2’s normative work on providing VPLMN network slice info to roaming UEs **are copied below** for references (the highlighted text below are closely related to SA3).

(C1) A slice based SoR mechanism to deliver enhanced slice-aware SoR information will reuse the current SoR mechanism defined in TS 23.122 [7] for SoR information delivery. The encoding of the enhanced slice-aware SoR information is in the CT1 remit.

(C2) The SoR container (which is used also to carry the enhanced slice-aware SoR information) from the UDM to the UE is security protected.

NOTE 1: SA3 may further define any upgrade of security protection mechanism of the SoR mechanism, if it was needed.

(C3) UDM requires knowing the support of the enhanced SoR information by the UE to deliver the enhanced slice-aware SoR information to the UE.

NOTE 2: Whether the UE provides additional assistance information (refer TR 23700-41) and which kind of additional assistance information need to be discussed in CT1. Any UE assistance information is transparently forwarded by UDM to SoR-AF during the triggering procedure by UDM. The SoR-AF should not attempt to fetch any assistance information if not provided by the UE. UE assistance information can either implicitly or explicitly indicate that the UE supports slice based SoR feature.

(C4) Only a UE supporting slice based SoR feature can receive the enhanced slice-aware SoR information via UDM, the enhanced slice aware information includes preferred PLMNs for specific S-NSSAIs in the UE subscription (a preferred PLMN list may be also be a single PLMN that is known by HPLMN to support the S-NSSAI, or a list of PLMNs in preference order that differs from the order of the basic SoR information that is also provided). when more than one S-NSSAI has slice aware information and all these S-NSSAIs are needed by the UE, a weighted approach to preferred PLMN selection is proposed.

NOTE 3: It is left to CT1 to decide whether to apply weighted approach or alternative approach for the PLMN selection procedure, when more than one S-NSSAI has slice aware information and all these S-NSSAIs are needed by the UE

(C5) The UE will perform the PLMN selection based on the received enhanced slice-aware SoR information.

(C6) As for the current SoR information, it shall be possible for the HPLMN to update the enhanced slice-aware SoR information when it is required by HPLMN, e.g., change in the UE subscription or other HPLMN trigger.

(C7) The SoR AF can take into account Subscribed S-NSSAIs of the UE. the SoR AF can get Subscribed S-NSSAIs using existing UDM services. This can also be used to generate enhanced slice-aware SoR information and legacy SoR information.

## 3.2 Observations

* **Ob 1a:** The enhanced slice-aware SoR information from the UDM to the UE (referred to as “downlink” hereinafter for simplicity) requires security protection (see C2). The current SoR mechanism in TS23.122/TS33.501 **shall be reused as much as possible** (see C1,C2).
* **Ob 1b:** Only authorized UE can receive the slice-aware SoR information (see C4).
* **Ob 2:** In orderfor the UDM to send slice-aware SoR information, the UE may need to provide additional assistance information (see C3, to be determined after discussion with CT1. UE sending information to the UDM is referred to as “uplink” hereinafter). **Whether the additional assistance information requires security protection should be determined by SA3**.

# 4 Detailed proposal

Based on the conclusions in SA2 and the above observations, it is proposed to endorse the following proposals:

* **Proposal 1:** The“downlink” (see **Ob 1a**)shall besecurity protected, reusing the current SoR mechanism in TS33.501 as much as possible. The slice-aware SoR information can only be sent to authorized UEs.

Principles updating TR33.886:

* 1. **Security requirements** (and corresponding Threats): The 5G system shall provide integrity protection to the enhanced slice-aware SoR information sent to a roaming UE.
	2. **Solution**: When calculating SoR-MAC-IAUSF, the parameter **P2** shall include the slice-aware SoR information (using the current mechanism).
	3. **Conclusions:** The enhanced slice-aware SoR information shall be integrity protected by the Home PLMN. When calculating SoR-MAC-IAUSF, the parameter **P2** shall include the slice-aware SoR information (using the current mechanism).

**NOTE:** Whether normative work is needed to update the parameter **P2** is subject to the work in stage 3 as well.

**[For convenience of discussion, the P2 definition in 33.501 is copied below]**

- P2 = octets included in SoR transparent container (in clause 9.11.3.51 of TS 24.501 [35]) beyond (and not including) octet 22,

* **Proposal 2:** Whether the “uplink” (see **Ob 2**) requires security protection should be studied in SA3. The conclusions shall be aligned to the conclusions in SA2 after discussion with CT1.

Principles updating TR33.886:

* 1. **Key issue details:** description on roaming UE sending additional messages to Home UDM.
	2. **Security requirements:** (No corresponding requirement but the following NOTE)

**NOTE**: whether addtional messages sent from a roaming UE to the Home UDM require security protection depends on the content of the messages. This will only be considered after the message content is made available from SA2 or CT1.