**SA WG2 Meeting #140 S2-2008xxx**

**19 August - 02 September 2020**

**Source: Nokia, Nokia Shanghai Bell**

**Title: KI #4: way forward proposal**

**Document for: Discussion/Approval**

**Agenda Item: 8.3**

**Work Item / Release: FS\_eNPN / Rel-17**

*Abstract of the contribution: This contribution proposes evaluations for the solutions of KI#4 and proposes the conclusion for KI#4.*

# 1 Discussion

This contribution proposes conclusions and way forward for Key Issue #4.

# 2 Proposal

The following change is proposed for TR 23.700-20.

# 7 Evaluation

## 7.X Key Issue #<X>: <Key Issue Title>

Editor's note: This clause will provide a general evaluation and comparison of the solutions per Key Issue #<X>.

# 8 Conclusions

## 8.X Key Issue #4: UE Onboarding and remote provisioning

It is proposed to agree on the following principles to support UE onboarding and remote provisioning:

**Limited connectivity and Network selection:**

1. Ability for the network to provide (limited) connectivity for UE(s) that do not have subscription and credentials needed for full authentication and initial registration procedure.
   1. Ability for the network to broadcast support onboarding of such UE(s). Ability for the UE(s) to consider this as part of network selection.
   2. Ability for the UE to provide an indicator both at RRC and NAS level while attempting to camp in the network for the purpose of onboarding. The indicator in RRC msg5 is needed for AMF selection, the indicator in the NAS registration request (e.g. registration type) is needed for execution of registration procedure that is tailored for onboarding and limited connectivity without subscription and credentials (e.g. omit subscription check).
2. Ability for the network to direct the UE towards the provisioning server and establish a secure channel for provisioning of credential and subscription information needed for authentication and registration procedure.
   1. Ability for the UE to optionally provide default credentials if the network requires it for initial authentication and for establishing secure channel with the provisioning server for onboarding.

**Provisioning server and onboarding configuration data in the UE and Network:**

1. The AMF is configured with Onboarding Configuration Data that are applied to Onboarding Services that are established by an AMF based on request from the UE. The AMF Onboarding Configuration Data contains the S-NSSAI and Onboarding DNN which is used to derive an SMF. In addition, the AMF Onboarding Configuration Data may contain the statically configured SMF for the Onboarding DNN. The SMF may also store Onboarding Configuration Data that contains statically configured UPF information for the Onboarding DNN. The PCF (and UDR) may store S-NSSAI and Onboarding DNN specific policy information.
2. In case of provisioning procedures using the user plane, the onboarding network shall offer a mechanism to configure the server address (“FQDN”) of the provisioning server on the UE. For this purpose, the PS address shall be part of the onboarding configuration data, which are made available to PCF and/or SMF dedicated to onboarding.
3. Configuration of the PS address in the onboarding configuration data can be supported using one of the following methods:
   1. Pre-configured.
   2. Dynamically by AF via NEF at O-SNPN, for instance using Service specific parameter provisioning procedure as specified in TS 23.502 [6] clause 4.15.6.7,
   3. Using new onboarding specific API to be defined.
4. Configuration of PS address from the onboarding configuration data to the UE can be supported using one of the following methods:
   1. SMF may deliver the Provisioning Server address(es) as part of extended Protocol Configuration Options (PCO) in PDU Session Establishment Response to UE. This is similar to use of PCO to configure Autoconfiguration server for UE in Wireless and Wireline Convergence (TR 23.716 [28] clause 6.10).
   2. Alternatively, Provisioning Server address(es) may be configured in the UE during Registration Procedure using UE Route Selection Policy (URSP) that may be subject UE capabilities. As part of UE initial registration (based on received UE capability information) AMF indicates to PCF that UE has requested restricted/provisioning registration. The PCF may initiate UE Policy delivery using UE Route Selection Policies (URSP), for instance to trigger UE after successful registration to request establishment of specific type of PDU Session limited to onboarding purposes only.
   3. In addition, Provisioning Server address(es) may be configured in the UE using service specific policies subject to UE capabilities similar to what is used for V2X communications as specified in TS 23.287 [29] clause 5.1.1 for ways how parameters may be made available to the UE and TS 23.287 [29] clause 6.2.5 for AF-based service parameter provisioning and TS 24.587 [30] clause 5.2.4 for configuration parameters such as validity timer, server address and geographical area.