**SA WG2 Meeting #S2-150E e-meeting S2-2202200**

**06 - 12 April, 2022, Elbonia**

**Source: Ericsson, ZTE**

**Title: Enabling time synchronization service via subscription**

**Document for: Discussion/Approval**

**Agenda Item: 9.7**

**Work Item / Release: FS\_5TRS\_URLLC / Rel-18**

*Abstract of the contribution: This contribution proposes to add subscription to enable the time synchronization service offered by 5GS. As such, subscription data is always verified before activating the service.*

1. Text proposal

It is proposed to agree the following changes to 23.700-25, regarding KI #3:

\*\*\*\*\* Beginning of CHANGES \*\*\*\*\*

6.X Solution #X: Enabling time synchronization service via subscription data

6.X.1 Introduction

This solution proposes to use subscription data as enabler of the time synchronization service in 5GS. Whenever a user/device is subscribed to time synchronization service, then the AF request for the service can be served. If the user/device is not subscribed, then the corresponding AF request will be rejected.

Since timing resiliency is a more complex service (i.e., costly), this solution proposes to include information about time synchronization and timing resiliency services in a new subscription data for this purpose. In such case, when AF requests for a timing resiliency service, then time synchronization service and timing resiliency shall be subscribed in order for the 5GS to provide the service. Subscription data for both services are required because timing resiliency will be added on top of the time synchronization service.

6.X.2 Functional Description

This solution is based on the following principles:

- A new subscription data type for time synchronization service is added. The new subscription data type includes authorization information for time synchronization and timing resiliency services. The new Time Synchronization Subscription data type,is provisioned in UDM/UDR for a UE or group of UEs.

- Upon receiving AF request for time synchronization, which may include a parameter related to timing resiliency service (via NEF if AF is 3rd party), the TSCTSF will use Nudm\_SDM\_Get service operation to retrieve subscription data about time synchronization for a UE or group of UEs (based on AF request).

- For using Nudm\_SDM\_Get, TSCTSF will include its NF ID, (new) Time Synchronization Subscription data type, DNN/S-NSSAI and the key for the subscription data type: SUPI/Internal Group Identifier (if AF is in the operator domain), or GPSI/External Group Identifier (if 3rd party AF).

- The TSCTSF subscribes to UDM to be notified when time synchronization subscription data is modified.

- If TSCTSF receives a subscription data (from UDM) that corresponds to the requested service, the TSCTSF proceeds with the service activation.

- If the subscription data does not correspond to the requested service by the AF, then the TSCTSF rejects the service.

The only impacted entities are: TSCTSF and UDM/UDR.

6.X.3 Procedures

Existing time synchronization activation procedures (see TS 23.502 [x], clause 4.15.9) are reused while an additional initial step is added for the TSCTSF to retrieve the UE or group of UEs subscription to the service. The step is also added to procedures used to activate “timing resiliency”. After the subscription data is verified, then the rest of the activation procedures can take place. After the subscription data is verified, then the rest of the activation procedures can take place.

Editor's note: The specific procedures for adding control of the time synchronization service via subscription data based on this solution is FFS. Whether there is a need to have corresponding DNN/S-NSSAI is FFS.

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

- TSCTSF: this entity will interact with UDM (Nudm\_SDM\_Get service operation) to retrieve time synchronization subscription data for a UE or group of UEs.

- UDM/UDR: these entities will be provisioned with new subscription data related to time synchronization. A new subscription data type for Time Synchronization is added with fields: time synchronization service, and timing resiliency service.

\*\*\*\*\* End of CHANGES \*\*\*\*\*