**SA WG2 Meeting #162 S2-2405264**

**15 - 19 April, 2024, Changsha, China revision of S2-2404556**

**Source: vivo**

**Title: New Sol: URSP provisioning for DualSteer traffic steering**

**Document for: Approval**

**Agenda Item: 19.13**

**Work Item / Release: FS\_MASSS / Rel-19**

*Abstract of the contribution: This paper proposes a new solution for URSP provisioning for DualSteer traffic steering.*

# 1 Discussion

This paper proposes a new solution for KI#1.1 subscription, Key Issue#1.2, and KI#1.4 policy of the FS\_MASSS SID (SP-240467).

# 2 Proposal

It is proposed to include the following changes in TR 23.700-54 V0.2.0.

 **\* \* \* \* Start of Changes \* \* \* \***

6.0 Mapping of Solutions to Key Issues

**Table 6.0-1: Mapping of DualSteer Solutions to Key Issues**

|  |  |
| --- | --- |
|  | **Key Issues for DualSteer** |
| **Solution#** | **Key Issue #1.1** | **Key Issue #1.2** | **Key Issue #1.3** | **Key Issue #1.4** |
| **#1.C** | X | X |  | X |
|  |  |  |  |  |

**Table 6.0-2: Mapping of ATSSS\_Ph4 Solutions to Key Issues**

|  |  |
| --- | --- |
|  | **Key Issues for ATSSS\_Ph4** |
| **Solution#** | **Key Issue #2.1** | **Key Issue #2.2** |
| **#2.1** | X |  |
| **#2.2** |  | X |
| **#2.3** | X |  |
| **#2.4** | X |  |
| **#2.5** | X |  |
| **#2.6** |  | X |
| **#2.7** |  | X |
| **#2.8** |  | X |

 **\* \* \* \* Second Change (all new text) \* \* \* \***

6.1.C Solution #1.C: URSP provisioning for DualSteer traffic steering

#### 6.1.C.1 Description

This solution addresses the Key Issue#1.1 "Subscription aspects to support DualSteer", Key Issue#1.2 "Registration and mobility management for DualSteer", and Key Issue#1.4 "Policy enhancements for DualSteer".

#### 6.1.C.2 Procedures

##### 6.1.C.2.1 Information flow



**Figure 6.1.C.2.1-1: URSP provisioning for DualSteer traffic steering**

1. The DualSteer device performs registration procedure with SUPI#1, it initiates Registration Request (SUCI#1/5G-GUTI#1) message towards the AMF#1 with UE Policy Container, which may contain DualSteer capable indication.

2. During the registration procedure, the AMF#1 registers with UDM subject to SUPI#1.

3. The AMF#1 invokes Npcf\_UEPolicyControl\_Create Request (UE Policy Container) towards the PCF#1.

4. The PCF#1 invokes Nudr\_DM\_Subscribe (SUPI#1, Policy Data, UE context Policy Control data) towards UDR to subscribe data modification notification of UE context Policy Control data of SUPI#1 as described in step 6 of clause 4.16.11 in TS 23.502 [4], which may be according to the DualSteer capable indication.

 Before step 4, the PCF#1 may invoke Nudr\_DM\_Create/Update service operation towards UDR as described in clause 4.16.11 of TS 23.502 [4].

Editor's note: Whether the PCF can generate URSP rules for Dualsteer traffic steering according to the Dualsteer capable indication is FFS, e.g., only for DualSteer device supports simultaneous traffic transfer.

5. The registration procedure is continued. The originally configured URSP rules for the SUPI are provisioned to the DualSteer device subject to SUPI#1.

6. The DualSteer device decides to perform registration with SUPI#2, steps 1-5 are repeated for SUPI#2. The registration procedure is via AMF#2 with PCF#2 involved.

7. The UDM associates the two registration procedures as dual-registration from a DualSteer device according to configuration.

8. If URSP rules need to be updated to enforce DualSteer traffic steering, the UDM updates the UE context policy control data of SUPI#1 and SUPI#2 to include DualSteer Pair ID in the DualSteer Ready IE as described in table 6.1.C.2.2-1.

9. The UDR notifies the updated UE context policy control data to PCF#1 and PCF#2, which includes the DualSteer Pair ID.

10. The PCF#1 and PCF#2 invoke Nudr\_DM\_Query (DualSteer Pair ID, Subscription Data, DualSteer Pair Data) towards the UDR to obtain the DualSteer Pair Data as described in table 6.1.C.2.2-2.

 The PCF#1 determines whether to update the URSP rules based on the received DualSteer subscription data. If the RAT type/SUPI in the Steering Descriptor does not correspond to the registered RAT type/SUPI of the SUPI#1, then the PCF#1 updates the URSP rules subject to SUPI#1, in which the associated (DNN, S-NSSAI) combination is removed. The PCF#2 also performs the URSP update for SUPI#2 accordingly.

11. If the URSP is updated, the PCF#1/PCF#2 performs UCU procedure to deliver the updated URSP to the DualSteer device as described in clause 4.2.4.3 of TS 23.502 [4].

After the UCU procedure for updating URSP rules, the UDM may subscribe UE reachability for both SUPIs towards the AMFs separately. When one of the SUPIs is out of coverage or de-registered, according to the UE reachability or registration status of one of the SUPIs, the UDM updates the UE context Policy Control subscription data to indicate that DualSteer is not ready, the PCFs will be notified with the indication of Dualsteer not ready and performs UCU procedure to provision the original URSP rules to DualSteer device.

Editor's note: How to avoid the URSP rules update frequently due to one of the SUPIs is out of coverage or de-registered is FFS.

##### 6.1.C.2.2 Subscription data

The UE context Policy Control subscription data for this solution is enhanced as following:

Table 6.1.C.2.2-1: UE context Policy Control Subscription data

| Subscription data type | Field | Description |
| --- | --- | --- |
| UE context policy control subscription data | … | … |
|  | DualSteer Ready | Indicates whether the SUPI is ready to be involved for DualSteer. If ready, it indicates the **DualSteer Pair Identifier**. |
|  | … | … |

In order to support DualSteer, new subscription data types, i.e., DualSteer Pair Data, is used to accommodate the management information for a DualSteer device.

To associate two subscriptions/SUPIs for DualSteer, the DualSteer Pair Data includes two SUPIs that share the same subscription profile.

Following tables 6.1.C.2.2-2 and 6.1.C.2.2-3 show the subscription enhancement for DualSteer.

Table 6.1.C.2.2-2: DualSteer Subscription data types

| Subscription data type | Field | Description |
| --- | --- | --- |
| DualSteer Pair Data | DualSteer Pair Identifier | Identifiers of the DualSteer Pair or the DualSteer device that the DualSteer Pair Data belongs to. |
|  | SUPI list | Corresponding SUPI list, i.e., 2 SUPIs |
|  | **DualSteer data:** |
|  | **Zero or more steering policy related entries:** |
|  | Steering Descriptor | Indicates the RAT type and/or SUPI. |
|  | **For each Steering Descriptor, one or more entries:** |
|  | (DNN, S-NSSAI) combination list | Indicates the (DNN, S-NSSAI) combination list for DualSteer traffic steering. |
| NOTE 1: The content of Dualsteer data is subject to the solutions to other KIs on DualSteer, considering the subscription information related to access and mobility, session management, and policy aspects, for example the DNN an S-NSSAI specific parameters to support DualSteer. |

Table 6.1.C.2.2-3: DualSteer Subscription data types keys

|  |  |  |
| --- | --- | --- |
| Subscription Data Types | Data Key | Data Sub Key |
| DualSteer Pair Data | DualSteer Pair Identifier | - |

The benefit of introducing the DualSteer Pair Data is to facilitate the management of the two SUPIs when they act as one DualSteer device and the subscription information related to the DualSteer device. They could be managed using the share data feature, for example, the network could assign the DNN an S-NSSAI specific parameters to support DualSteer, or the PCF could update policies that targeting the pair.

Meanwhile, if the UE itself is not capable of DualSteer feature, e.g., only perform single registration, it can still use the common subscription data of one SUPI, i.e., the network and UE do not need to consider any DualSteer related information.

#### 6.1.C.3 Impacts on services, entities and interfaces

Editor's note: This clause captures impacts on existing 3GPP services, entities and interfaces.

**UDM/UDR:**

- Subscription data is enhanced to support DualSteer.

**(H-)PCF:**

- Determine URSP based on subscription data related to DualSteer.

**DualSteer device:**

- May indicate DualSteer capable indication to PCF.

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