**3GPP TSG-WG SA2 Meeting #162 *S2-2404061r01***

**Changsha, China, April 15 – April 19, 2024 (revision of S2-240xxxx)**

**Source: ETRI**

**Title: New Sol. to KI #1.2 and #1.4: Policy Enhancement for DualSteer**

**Document for: Approval**

**Agenda Item: 19.13**

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

*Abstract: This paper proposes a new solution for KI* #1.2 and *#1.4.*

# 1. Introduction

TR 23.700-54 describes the key issue #1.2 “Registration and mobility management for DualSteer” including the following:

- Whether and what enhancements are needed in functions and procedures of registration, deregistration and mobility management for supporting DualSteer.

TR 23.700-54 describes the key issue #1.4 “Policy enhancements for DualSteer” including the following:

- Whether and what policies need to be provided by the HPLMN to guide the DualSteer device to decide to connect to an additional PLMN/PNI-NPN, or an additional 3GPP access network within the same PLMN;

- For DualSteer traffic steering, whether and what policies need to be provided by the HPLMN to guide the DualSteer device to select a 3GPP access network to be used for the new service;

- For DualSteer traffic switching, whether and what policies need to be provided by the HPLMN to guide the DualSteer device for traffic switching between two connected 3GPP access networks;

Regarding to the key issue #1.2 and #1.4, this contribution proposes the following enhancement to policy and registration procedure to support DualSteer.

- DualSteer policy may be provisioned during registration procedure

- DualSteer policy may have precedence, Traffic Descriptor, prioritized (PLMN, RAT) list, etc.

- DualSteer policy may be used for both traffic steering and traffic switching.

# 2. Proposal

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

\* \* \* \* Start of change \* \* \* \*

# 6 Solutions

## 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> |
| #X: Policy Enhancement for DualSteer |  | **X** |  | **X** |
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\* \* \* \* Second change **(ALL NEW TEXT)** \* \* \* \*

## 6.1 Solutions for DualSteer

### 6.1.X Solution #X: Policy Enhancement for DualSteer

#### 6.1.X.1 Background

This paper assumes the followings:

* DualSteer Device has two SUPIs of SUPI1 and SUPI2 and a convergence layer that mediates control and traffic between the two SUPIs. The usage of DualSteer policy in convergence layer is implementation dependent.
* DualSteer policy is managed by UDM as part of Subscription data of SUPI1 and/or SUPI2 and is shared by SUPI1 and SUPI2.
* DualSteer policy is used for both DualSteer traffic steering and switching of application traffic.
* DualSteer traffic steering and switching include selection of PLMN/RAT.
* PLMN selection and RAT selection is performed at the same time. PLMN and RAT are determined together at the time of selection based on time and location.
* There may be more than one RATs in a PLMN. RATs supported by a PLMN may differ from RATs by another PLMN, where the two PLMN both cover geographic area where DualSteer Device is.

An example scenario of using DualSteer policy is as following:

1. SUPI1 selects a default PLMN/RAT (PLMN1/RAT1) based on default DualSteer policy, which is configured or previously downloaded in DualSteer Device.
2. SUPI1 registers and receives DualSteer policy from HPLMN.
3. SUPI1 establishes a default PDU session (PDU session1).
4. An application is selected to run in DualSteer Device.
5. Based on the DualSteer policy, SUPI2 may select another PLMN/RAT (PLMN2/RAT2) available at the location of DualSteer Device. If (PLMN1/RAT1) is best for the application, according to DualSteer policy, selection of (PLMN2/RAT2) is not needed.
6. SUPI2 registers and establishes a PDU session (PDU session2) for the application. DNN and S-NSSAI is selected based on the application.
7. Application traffic communication has two alternatives depending on application.
	1. Application traffic can be waited until the PDU session2 is established and use PDU session2.
	2. Application traffic can be communicated via PDU session 1 and switched to PDU session 2.

#### 6.1.X.1 Description

DualSteer policy may be provisioned to DualSteer Device during Registration procedure. DualSteer policy is used both for DualSteer traffic steering and switching.

When a SUPI of DualSteer Device registers with a PLMN, DualSteer policy may be provisioned by the HPLMN. During the registration procedure of a SUPI, DualSteer policy will be provisioned by HPLMN. UE may include “UE capability of supporting DualSteer policy” in the Registration request message of the first SUPI of DualSteer Device. For registration of the other SUPI of the DualSteer Device, UE may not include “UE capability of supporting DualSteer policy” and opt out receiving DualSteer policy.

DualSteer policy for a DualSteer device are stored in UDR. The DualSteer policy may include (precedence, Traffic Descriptor, prioritized list of (PLMN, RAT) combination). Precedence is priority of applying Traffic Descriptor, Traffic Descriptor describes service data traffic by Application ID, DNN, S-NASSAI, IP packet filter set, Ethernet packet filter set, etc. Prioritized list of (PLMN, RAT) combination is list of (PLMN/RAT) combination with priority for the service traffic characterized by Traffic Descriptor.

(PLMN, RAT) combination may have parameters representing Radio Access Technology(RAT), MCC and MNC of PLMN operator. Each parameter may have \* representing any. If MCC and MNC of PLMN operator has \*, then this (PLMN, RAT) combination follows Steering of Roaming policy given to UE.

Figure 6.1.X.1.1-1 shows simplified DualSteer poliy data.

Figure 6.1.X.1.1-2 shows updated URSP with DualSteer poliy data.



Figure 6.1.X.1.1-1: DualSteer policy data



Figure 6.1.X.1.1-2: UE Route Selection Policy Rule with DualSteer policy data

#### 6.1.X.2 Procedures

#### 6.1.X.2.1 DualSteer policy provision during Registration procedure



Figure 6.1.X.2.1-1: Registration procedure for DualSteer

1. UE-initiated Registration request that may include “UE capability of supporting DualSteer policy” in UE Policy Container. UE may not include “UE capability of supporting DualSteer policy” for the registration of second SUPI.

2-14a. same as steps 2 to 14a in clause 4.2.2.2.2 of TS 23.502.

14b. AMF authorizes that UE has subscription of DualSteer service. If authorization fails, DualSteer policy shall not be provisioned to UE.

14c-15. same as steps 14c to 15 in clause 4.2.2.2.2 of TS 23.502.

16. PCF provisions DualSteer policy to UE of the SUPI. DualSteer policy may be included in UE Policy Container.

17-20. same as steps 17 to 20 in clause 4.2.2.2.2 of TS 23.502.

21. Registration Accept may include DualSteer policy in UE Policy Container.

22-25. same as steps 22 to 25 in clause 4.2.2.2.2 of TS 23.502.

#### 6.1.X.2.1 DualSteer policy provision during UE Configuration Update procedure

UE Configuration Update procedure may be used for update of DualSteer Policy.

Steps 0 to 5 in clause 4.2.4.3 of TS 23.502 is applied with following update:

1. H-PCF may initiate delivery of DualSteer policy to UE invoking Namf\_Communication\_N1N2MessageTransfer service including UE Policy Container. DualSteer policy may be included in Policy Sections in UE Policy Container.

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

**Impact on UE**:

- The UE may include “UE capability of supporting DualSteer policy” in UE policy Container of Registration Request message.

- The UE may receive DualSteer policy in UE policy Container of Registration Accept message.

**Impact on AMF**:

-    The AMF may authorize DualSteer service of the UE.

**Impact on PCF**:

-    The PCF may create DualSteer policy and provision it to the UE.

-    The PCF may initiate DualSteer policy delivery to the UE.

**Impact on UDR**:

- The UDR may store DualSteer policy in subscription data of a UE.

Editor's note: The usage of the term UE or DualSteer Device will be clarified

\* \* \* \* End of change \* \* \* \*