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**Source: Apple, ETRI, China Telecom, Nokia, Nokia Shanghai Bell, LG Electronics, OPPO, NEC, KDDI**

**Title: FS\_MASSS Architectural Assumptions and Requirements for DualSteer**

**Document for: Approval**

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*Abstract of the contribution: This paper proposes architectural assumptions and requirements for DualSteer for the FS\_MASSS TR 23.700-54.*

# 1 Discussion

This paper proposes architectural assumptions and requirements for DualSteerbased on content of the FS\_MASSS SID (SP-231802) and the DualSteer requirements in TS 22.261.

The objectives of the FS\_MASSS SID, SP-2401315, include the following statements:

* **The following scenarios are considered:**

1. Two NR/5GC accesses in a single PLMN (HPLMN or VPLMN) with each access being NR TN or NR NTN;

2. Two NR/5GC accesses in two different PLMNs (including two VPLMNs or a VPLMN and the HPLMN) with each access being NR TN or NR NTN;

3. NR/5GC access and E-UTRA/EPC access in two different PLMNs (including two VPLMNs or a VPLMN and the HPLMN);

4. NR/5GC access and E-UTRA/EPC access in a single PLMN (HPLMN or VPLMN);

5. PNI-NPN (integrated with the HPLMN or integrated with the VPLMN) and PLMN access (TN/NTN plus TN or NTN). This scenario assumes only non-simultaneous transmission.

* The study assumes there is no coordination in RAN between the two 3GPP access networks where the DualSteer Device is accessing simultaneously.
* For the PNI-NPN scenario, the subscriber is assumed to be a subscriber of the PNI-NPN.
* Each subscription / SUPI of the DualSteer Device is used to connect to only one of the 3GPP access at any given point in time.
* No impacts on network slicing features, i.e. network slicing features apply to each subscription / SUPI separately.

The Traffic steering and switching over two 3GPP access networks from TS 22.261, clause 6.50, include the following statements:

* Scenarios may also include traffic steering and/or switching across LTE/EPC and NR/5GC, with anchoring in 5GC.
* Traffic policies are intended to be in full control of the home network operator.
* The requirements can apply to different DualSteer device types (e.g., smartphones, IoT, UAV, VSAT devices).
* The requirements apply to a subscriber with two subscriptions/SUPIs, sharing one subscription profile from the same operator. For simultaneous transmission over two networks, a DualSteer device is assumed to include two separate UEs.
* Inter-PLMN requirements can apply also to PLMN-NPN scenarios assuming a PLMN-integrated NPN (NPN hosted by a PLMN or offered as a slice of a PLMN).
* For any particular service, at any given time, the DualSteer device shall transmit all traffic of that service using only a single 3GPP access network.
* Charging information should be collected for both 3GPP access networks; in case the two 3GPP access networks belong to different PLMNs, or a PLMN and NPN, a proper business/roaming agreement among network operators is assumed.
* The NPN is hosted by a PLMN or offered as a slice of a PLMN, data anchoring in the NPN, and a business/roaming agreement between the PLMN and the NPN operator (if different).

# 2 Proposal

It is proposed to include the following changes in TR 23.700-54 V0.1.0.

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

### 4.1.1 Architectural Assumptions for DualSteer

- The 5GC architecture as specified in TS 23.501 [3], TS 23.502 [4], and TS 23.503 [5] are regarded as the baseline for this study.

- The subscriber is assumed to have two subscriptions/SUPIs from the same operator.

- For simultaneous transmission over two 3GPP access networks, the DualSteer Device is assumed to include two separate UEs.

Editor’s Note: During the study it will be determined whether there is a need for close coordination between the two UEs in a DualSteer Device at the 3GPP layers, and whether that coordination needs be described in normative or informative manner.

- It is assumed that no coordination is required between the two 3GPP RAN the DualSteer Device may be connected to.

- Each subscription (i.e. SUPI) is used to connect to only one of the 3GPP access networks at any given point in time.

- No impacts are assumed for network slicing features, i.e. network slicing features apply to each subscription / SUPI separately.

- Solutions are expected to demonstrate not to impact PLMNs that do not support DualSteer functionality.

- Traffic policies are controlled by the home network operator.

- For sessions subject to traffic steering and/or to traffic switching of a DualSteer device's user data when across two 3GPP access networks of VPLMN(s) and HPLMN (including two VPLMNs or a VPLMN and the HPLMN), it is assumed that the anchoring of all data traffic is in the HPLMN.

-    For any particular service, at any given time, it is assumed that the DualSteer device transmits all traffic of that service using only a single 3GPP access network.

- No impacts on RAN and UICC apps.

- The regenerative based NTN access will not be considered in this release.

- Splitting functionality is not supported for DualSteer in any scenario.

**\* \* \* \* Next Changes \* \* \* \***

### 4.2.1 Architectural Requirements for DualSteer

Service Requirements for DualSteer are specified in clause 6.50 of TS 22.261 [2].

**The following scenarios shall be supported:**

1. Two NR/5GC accesses in a single PLMN (HPLMN or VPLMN) with each access being NR TN or NR NTN;

2. Two NR/5GC accesses in two different PLMNs (including two VPLMNs or a VPLMN and the HPLMN) with each access being NR TN or NR NTN;

3. NR/5GC access and E-UTRA/EPC access in two different PLMNs (including two VPLMNs or a VPLMN and the HPLMN);

4. NR/5GC access and E-UTRA/EPC access in a single PLMN (HPLMN or VPLMN);

5. PNI-NPN (integrated with the HPLMN) and PLMN access (TN/NTN plus TN or NTN). This scenario assumes only non-simultaneous transmission.

The following architectural requirements are applicable to this study:

- Scenario 5) requires the subscriber to be a subscriber of the PNI-NPN. In this scenario the PNI-NPN is hosted by a HPLMN. For sessions subject to traffic steering and/or to traffic switching, this scenario requires data anchoring in the PNI-NPN.

- In case the two 3GPP access networks belong to different PLMNs, or a PLMN and PNI-NPN, a proper business/roaming agreement among network operators is required.

- The 5GS shall be able to identify and link the two SUPIs that are part of the subscription used for DualSteer services.

- The 5GS shall be able to differentiate between the two connections of the DualSteer device.

- The 5GS shall be able to minimize impacts to CN and OAM.

- The 5GS shall be able to support mechanisms to minimize service interruption when switching a DualSteer device's user data, for one or multiple services, between two 3GPP access networks.

- The solution should minimize the interaction required between the two separate UEs of the DualSteer device.

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