**3GPP TSG-SA3 Meeting #115 *S3-23xxxx***

**Athens, February 26 – March 01, 2024**

**Source: Nokia, Nokia Shanghai Bell, ZTE Corporation, China Telecom, OPPO, China Unicom, CATT, CableLabs, Lenovo**

**Title: New SID on security aspects for Multi-Access (DualSteer + ATSSS Ph-4)**

**Document for: Approval**

**Agenda Item: X**

3GPP™ Work Item Description

Information on Work Items can be found at <http://www.3gpp.org/Work-Items>
See also the [3GPP Working Procedures](http://www.3gpp.org/specifications-groups/working-procedures), article 39 and the TSG Working Methods in [3GPP TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm)

Title: Study on security aspects for Multi-Access (DualSteer + ATSSS Ph-4)

Acronym: FS\_MASSS\_Sec

Unique identifier: TBD

Potential target Release: Rel-19

# 1 Impacts

{For Normative work, identify the anticipated impacts. For a Study, identify the scope of the study}

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Affects: | UICC apps | ME | AN | CN | Others (specify) |
| Yes |  | X |  | X |  |
| No | X |  |  |  | X |
| Don't know |  |  | X |  |  |

# 2 Classification of the Work Item and linked work items

## 2.1 Primary classification

### This work item is a …

|  |  |
| --- | --- |
| X | Study  |
|  | Normative – Stage 1 |
|  | Normative – Stage 2 |
|  | Normative – Stage 3 |
|  | Normative – Other\* |

**\* Other = e.g. testing**

## 2.2 Parent Work Item

 For a brand-new topic, use “N/A” in the table below. Otherwise indicate the parent Work Item.

|  |
| --- |
| Parent Work / Study Items  |
| Acronym | Working Group | Unique ID | Title (as in 3GPP Work Plan) |
|  |  |  |  |

### 2.3 Other related Work Items and dependencies

|  |
| --- |
| Other related Work /Study Items (if any) |
| Unique ID | Title | Nature of relationship |
| 960018 | Study on upper layer traffic steering, switching and split over dual 3GPP access | Stage 1 study for DualSteer in Rel-19 |
| 1020031 | Upper layer traffic steering and switching over dual 3GPP access  | Stage 1 work item for DualSteer in Rel-19 |
| 1020070 | Study on Multi-Access (DualSteer and ATSSS\_Ph4) | Stage 2 work study on Multi-Access in Rel-19 by SA2 |

# 3 Justification

**Background**

As identified in the SA1 study and service requirements on DualSteer (see TR 22.841 and TS 22.261), it is beneficial for a DualSteer Device to apply traffic steering and/or switching between two 3GPP access networks connected to the same or different PLMN networks. Use cases cover examples of diverse combinations of 3GPP access networks using the same or different RATs, including terrestrial NR plus NR, or NR plus E-UTRA (e.g. using a combined EPC and 5GC), a mix of terrestrial and non-terrestrial NR, as well as dual non-terrestrial NR access (using same or different NTN orbits, e.g., GEO/MEO/LEO).

In the last SA Plenary #102 SA has approved a new SA2 study on Multi-Access (SP-231802) including two sets of work tasks, i.e., for DualSteer and ATSSS (Phase 4). In short, the objectives of the SA2 study (FS\_MASSS) can be summarized as follows:

- WT#1: Study the overall architecture and function enhancements to 5GS to support a DualSteer device according to the definition of DualSteer device in TS 22.261. Different scenarios are considered based on the type of 3GPP access (NR TN and/or NTN, E-UTRA) and whether the access is in one or two PLMNs. Subscription, registration and session management and policies related aspects are in the scope of the study.

- WT#2: Study how the MPQUIC steering functionality can be extended to be able to steer, switch, and split non-UDP traffic (TCP, IP, Ethernet traffic).

- WT#3: Study a potential functional architecture and procedures for steering, switching and splitting of traffic not based on current TNGF/N3IWF over non 3GPP access.

In the last SA2 Adhoc-e meeting #160 TR 23.700-54 (FS\_MASSS) has included the following KIs, that corresponds to the above-mentioned WTs:

- Subscription aspects to support DualSteer.

- Registration and mobility management for DualSteer.

- MPQUIC steering functionality to steer, switch and split non-UDP traffic.

- Simplified ATSSS architecture over non-3GPP access.

**Justification of the SA3 study**

The security aspects FS\_MASSS and their impact in the architecture are to be covered in SA3. More specifically, in principle the following topics require SA3 coordination as per potential security impact:

1) DualSteer device is a new type of device that will register onto the 5G System, thus it is required to ensure that updated registration procedures for DualSteer devices are secured. Please note that a DualSteer device can be a single UE, in case of non-simultaneous data transmission over the two networks, or two separate UEs in case of simultaneous data transmission over the two networks [TS 22.261].

2) For the new ATSSS (Ph4) envisioned scenario, i.e., non-3GPP access is not based on current TNGF/N3IWF, the new required architecture enhancement should not compromise the overall security posture of the 5G network, in particular:

 - whether to keep NAS security context on non-3GPP access.

 - whether to keep IPsec on user plane and/or control plane.

 - whether new security mechanisms are to be considered in UE procedures such as the registration and connectivity to the 5G system in the context of ATSSS between 3GPP access and non-3GPP access without 5G NAS.

3) In Rel-18 MPQUIC steering functionality using UDP proxying over HTTP was introduced to enable ATSSS of UDP traffic. For TCP traffic ATSSS has been relaying on MPTCP steering functionality since Rel-16. Now in Rel-19 SA2 will study the adoption of MPQUIC steering functionality to steer, switch and split non-UDP traffic and simplify the deployment burden of having both proxy functionalities for the same feature. MPQUIC provides high security features such as encryption by default using TLS and authentication including the use of digital certificates. Thus, the adoption of MPQUIC for all type of traffic in the context of ATSSS in 5GS may require SA3 to provide security considerations in the current architecture.

In order to facilitate the required coordination between SA2 and SA3, the proposal is to approve a SID in SA3 that collects the security aspects in the new type of devices, associated registration procedures, and the support of ATSSS in new non-3GPP access scenario not subject to the deployment of TNGF/N3IWF.

# 4 Objective

Based on the above justification, the following objectives will be studied based on the related Rel-19 work mainly in SA1 and SA2:

WT#1: Ensure that updated registration procedures for DualSteer devices are secured.

WT#2: Study the security aspects of the new enhanced architecture supporting traffic steering, switching and splitting (ATSSS) between 3GPP access and “non-3GPP access without 5G NAS”.

WT#3: Study the security considerations to be made in the 5G security architecture due to the potential adoption of MPQUIC for all types of traffic in 5GS in the context of the ATSSS feature.

Any other potential security issue coming from SA2 study (TR 23.700-54) should be considered in this SID.

## TU estimates and dependencies

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Work Task ID | TU Estimate(Study) | TU Estimate(Normative) | RAN Dependency(Yes/No/Maybe)  | Inter Work Tasks Dependency Editor’s Note: This column should highlight if WT#x is self-contained, or is dependent on completion of other WTs |
| WT#1 | 1 | 0.5 | No | WT#1 is self-contained |
| WT#2 | 1.5 | 0.5 | No | WT#2 is self-contained |
| WT#3 | 1 | 0.5 | Maybe | WT#3 is self-contained |

Total TU estimates for the study phase: 3.5

Total TU estimates for the normative phase: 1.5

Total TU estimates: 5

# 5 Expected Output and Time scale

***{If this WID covers both stage 2 and stage 3, clearly indicate the different completion dates.}***

|  |
| --- |
| New specifications {One line per specification. Create/delete lines as needed} |
| Type  | TS/TR number | Title | For info at TSG#  | For approval at TSG# | Rapporteur |
| Internal TR | 33.xyz | Study on security aspects for Multi-Access (DualSteer + ATSSS Ph-4)  | SA#xx | SA#yy |  |
|  |  |   |  |  |  |

|  |
| --- |
| Impacted existing TS/TR {One line per specification. Create/delete lines as needed} |
| TS/TR No. | Description of change  | Target completion plenary# | Remarks |
|  |  |  |  |
|  |  |  |  |

# 6 Work item Rapporteur(s)

# 7 Work item leadership

SA3

# 8 Aspects that involve other WGs

Stage 3 aspects covered by CT WGs. Potential interaction with SA2 WG for architecture aspects, with RAN WGs for RAN dependent issues.

# 9 Supporting Individual Members

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| --- |
| Supporting IM name |
| Nokia |
| Nokia Shanghai Bell |
| ZTE Corporation |
| China Telecom |
| OPPO |
| CATT |
| CableLabs |
| Lenovo |