**3GPP TSG-SA WG6 Meeting #56 S6-23xxxx**

**Gothenburg, Sweden 21st – 25th August 2023 (revision of S6-23xxxx)**

**Source: Lenovo**

**Title: Study on application layer support for ATSSS**

**Document for: Approval**

**Agenda Item: xx**

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 application layer support for ATSSS

Acronym: FS\_ATSSS\_APP

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 |  |  |
| Don't know | X |  |  |  | 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 |
| **990111** | Access Traffic Steering, Switch and Splitting support in the 5G system architecture; Phase 3 | Rel-18 SA2 Work on ATSSS |
| **900012** | Access Traffic Steering, Switch and Splitting support in the 5G system architecture; Phase 2 | Rel-17 SA2 Work on ATSSS |

# 3 Justification

The Access Traffic Steering, Switching, Splitting **(**ATSSS) feature, as defined in TS 23.501 clause 5.32, enables data traffic to be exchanged between a UE and a UPF over multiple access paths. Each access path may be using either 3GPP access (such as terrestrial or non-terrestrial NG-RAN) or non-3GPP access (such as WLAN). In order to enable the ATSSS feature, an MA PDU Session must be established, and configure the UE and UPF with steering rules. The steering policies are created by the PCF during the MA PDU Session establishment procedure and are employed by the SMF to create "ATSSS rules" for the UE and "Multi-Access Rules (MAR)" for the UPF. The steering rules indicate how the traffic of the MA PDU Session should be distributed over the available access paths between the UE and the UPF. Each steering rule contains a “steering functionality” (e.g. MPTCP, MPQUIC, ATSSS-LL) and a “steering mode” (e.g. load-balancing, active-standby, smallest-delay, redundant, etc.).

The implementation of the ATSSS feature in real-world mobile networks is complex because it has a broad network-wide impact. Indeed, the ATSSS feature affects many 5GC network functions, including the UE, UPF, AMF, SMF, PCF, etc. Moreover, it demands non-3GPP interworking functions, such as the N3IWF and the TNGF, to support access paths over non-3GPP access networks. Implementing the ATSSS feature in practice means carrying out substantial and complex changes to many 5G network functions and supporting also non-3GPP interworking functions and the associated procedures in the UE for communicating with these functions.

The proposed study aims investigate a more simplified application-layer ATSSS architecture, which offers the same benefits as the existing ATSSS feature (as defined in SA2), allowing data traffic to be exchanged over multiple access paths, but it should also (a) be less complex and (b) could support more use cases, e.g. non-3GPP access paths that do not traverse 5GC.

# 4 Objective

The objectives of the study are to:

1. Evaluate the need for an overall application framework/enabling layer architecture and associated requirements to support application-layer Access Traffic Steering, Switching, Splitting **(**ATSSS-APP) over multiple access networks (3gpp and non-3gpp);
2. Study architectural and functional implications on existing application enablers (e.g. SEAL, SEALDD) for supporting ATSSS-APP architecture;
3. Identify key issues based on 1) and 2), develop corresponding functional model and potential solutions (e.g. discovery, multi-access session establishment, application service continuity) to support the implementation of ATSSS-APP, including potential UE and network APIs; and
4. Investigate possible impacts of application-layer ATSSS for different deployments and business models.

# 5 Expected Output and Time scale

|  |
| --- |
| 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 | 23.XYZ | Study on application layer support for ATSSS | TSG#105 | TSG#106 | Pateromichelakis Emmanouil *<epateromiche@lenovo.com>* |
|  |  |  |  |  |  |

|  |
| --- |
| 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)

Pateromichelakis, Emmanouil (Manos), *epateromiche@lenovo.com*

# 7 Work item leadership

SA6

# 8 Aspects that involve other WGs

SA2 for system aspects, SA3 for security aspects, and SA5 for management and charging aspects.

# 9 Supporting Individual Members

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| --- |
| Supporting IM name |
| Lenovo |
|  |