**3GPP TSG SA2#159 S2-230xxxx**

**9 - 13 Oct, 2023, Xiamen, China**

**Source: ZTE**

**Title: Study on UPF enhancement for Exposure and SBA Phase 2**

**Document for: Approval**

**Agenda Item: x.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 UPF enhancement for Exposure And SBA Phase 2

Acronym: FS\_UPEAS\_Ph2

Unique identifier: xxxxxx

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 |  |
| No | X | X | X |  | X |
| Don't know |  |  |  |  |  |

# 2 Classification of the Work Item and linked work items

## 2.1 Primary classification

### This work item is a …

{Tick one box. "**Feature** / **Building Block** / Work Task" form a hierarchical structure. E.g. no Building Block can be proposed without a corresponding parent Feature. The full structure of all existing Work Items is shown in the 3GPP Work Plan in <ftp://ftp.3gpp.org/Information/WORK_PLAN>}

|  |  |
| --- | --- |
|  | Feature |
|  | Building Block |
|  | Work Task |
| X | Study Item |

## 2.2 Parent Work Item

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

### 2.3 Other related Work Items and dependencies

{List here other Work Items which relate to the proposed one, such as a Work Item in an earlier Release if further enhancing the feature from the previous Release)}

|  |  |  |
| --- | --- | --- |
| Other related Work /Study Items (if any) | | |
| Unique ID | Title | Nature of relationship |
| 790007 | Study on Enhancements to the Service-Based 5G System Architecture  (Release 16) | *Study of extending SBA to user plane but without standardization* |
| 940076 | Study on UPF enhancement for Exposure And SBA | *Corresponding study of architecture enhancements and procedures (SA2)* |
| 970019 | UPF enhancement for Exposure and SBA | *Rel-18 WI for Enhancement of support for UPF Event Exposure and SBA (SA2)* |
| 990002 | CT aspects of UPF enhancement for exposure and SBA | *Impacts on protocols and interfaces to support the UPF enhancement for Exposure and SBA (CT4)* |

# 3 Justification

UPF Event Exposure capability is supported in 5GS since Rel-17. In Rel-18 FS\_UPEAS study, further enhancements for supporting UPF enhancement for Exposure and SBA are studied, including UPF event exposure service(s) registration/deregistration and discovery via the NRF, UPF event exposure services enhancement etc. Two key issues from FS\_UPEAS study have been concluded and progressed to the normative phase according to TR 23.700-62.

During Rel-18 study, some other issues were raised, however not studied due to the time limitation. The issues include:

- The user plane functionalities supported by the UPF are described in clause 6.2.3 of TS23.501. There is need to study modular architecture for these user plane functionalities to enable the functionalities to be dynamically and flexibly inserted in the data path of a PDU session according to its requirements.

- Currently the AF subscribes the UPF event via PCF and SMF. In order to subscribe the UPF event the AF needs to find the target PCF/SMF/UPF. The procedure may need to be further enhanced to allow direct subscription of the UPF event from AF. In addition it may need to investigate whether there is any additional use cases that the UPF send report/notification directly to the service consumer without via SMF.

- The current FAR(Forwarding Action Rule) in N4 interface includes the Container for header enrichment and the UPF uses this information to insert headers for uplink traffic at the N6. However, the current packet headers can just be used for marking to steer through a number of service functions in the N6. An operator may decide to make use of packet headers that provide relevant information to an operator platform. It needs to study the enhancement to allow additional functionality to permit UPF handling of headers marking, uplink and downlink, as well as detection and reporting/notifications.

This study is to further investigate the issues described above for completing UPF capabilities for exposure and SBA.

# 4 Objective

The study item will consider the following aspects to support better integration of UPF into the 5GC SBA:

WT#2: Study whether and how to support dedicated UPF providing a selected user plane functionality, e.g. NAT, Packet inspection, Packet buffering, etc, including the impact on UPF selection.

WT#3: Study any potential enhancements on the UPF event exposure service (e.g. direct subscription from AF, via N6 interface).

WT#4: Study enhancing the interface between AF and 5GC to allow additional functionality to permit UPF handling of headers, uplink and downlink, as well as detection and reporting/notifications. Analysis of existing and/or new exposure and provisioning functionality/interface(s) is expected

## TU estimates and dependencies

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Work Task ID | TU Estimate  (Study) | TU Estimate  (Normative) | RAN Dependency  (Yes/No/Maybe) | Inter Work Tasks Dependency |
| WT#1 | 0.5 | 0.5 | No | WT#1 is self-contained |
| WT#2 | 0.75 | 0.75 | No | WT#2 is self-contained |
| WT#3 | 0.75 | 0.5 | No | WT#3 is self-contained. |
| WT#4 | 0.75 | 0.75 | No | WT#4 is self-contained. |

Total TU estimates for the study phase: 2.75

Total TU estimates for the normative phase: 2.5

Total TU estimates: 5.25

# 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.abc | Study on UPF enhancement for Exposure And SBA Phase 2 | TSG#103  March 2024 | TSG#104  June 2024 |  |

{Note 1: Only TSs may contain normative provisions. Study Items shall create or impact only TRs.  
"Internal TR" is intended for 3GPP internal use only whereas "External TR" may be transposed by OPs.}

{Note 2: The first listed Rapporteur is the specification primary Rapporteur. Secondary Rapporteur(s) are possible for particular aspect(s) of the TS/TR. In this case, their responsibility has to be provided as "Remarks".}

|  |  |  |  |
| --- | --- | --- | --- |
| 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)

TBC

# 7 Work item leadership

SA2

# 8 Aspects that involve other WGs

Security aspects, if any, will be addressed by SA3.

Charging aspects, will be addressed by SA5.

# 9 Supporting Individual Members

|  |
| --- |
| Supporting IM name |
| AT&T |
| China Mobile |
| Deutsche Telekom |
| DISH Network |
| ETRI |
| MATRIXX Software |
| SK Telecom |
| Sandvine |
| Samsung |
| Rakuten Mobile |
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