**3GPP TSG-WG SA2 Meeting #162 *S2-2404021r01***

**Changsha, China, April 15- April 19, 2024**

**Source: China Mobile**

**Title: Evaluation and Conclusion for KI#1**

**Document for: Approval**

**Agenda Item: 19.11**

**Work Item / Release: FS\_UPEAS\_Ph2 / Rel-19**

*Abstract: Propose Evaluation/Conclusion for KI#1.*

# 1. Discussion

This proposal proposes the evaluation and conclusion for KI#1 as baseline for normative work.

# 2. Proposal

It is proposed to capture the following changes in TR 23.700-63.

*FIRST CHANGE*

# 7 Overall Evaluation

## 7.X Key Issue #1: Selection of UPF providing a selected user plane functionality

There are four solutions (Sol#2, Sol#3, Sol#4, and Sol#6) mapping to Key Issue #1.

This Key Issue has the following aspects to study:

- Justify use cases that necessitate a need to extend the existing UPF capabilities in case UPF has integrated additional functionalities.

- How to extend the existing UPF advertising capabilities.

- The mechanism to enhance the UPF selection to support specific user plane functionalities.

Following use cases have been indicated to extend the existing UPF capabilities:

- Identifying UPF supporting features as NAT (Sol#2).

- DDoS protection or Firewall support in UPF (Sol#2).

- Layer 7 Deep Packet Inspection (DPI) with specific DPI levels, e.g. specific transport levels such as QUIC, MP-QUIC, MP-TCP, MASQUE and/or application such as HTTP, RTP, SIP, WebRTC, etc. (including Sol#2, Sol#4).

- Different hardware configurations (e.g. CPU or NIC (Network Interface Controller) that brings better capacity or latency characteristics) (Sol#3).

- Partial support of a standardized feature (Sol#3).

- Non-standard features implemented in UPF, such as e.g. NAT, firewalling or advanced non standardized reporting or forwarding features that cannot be mapped to current information elements as capabilities (Sol#3).

- Parental control, with optionally specific controls to be enforced to the traffic (Sol#4);

- MASQUE proxy functionality (Sol#4).

Following methods have been indicated to extend the existing UPF advertising capabilities based on the extended UPF capabilities:

- Reusing procedures in clause 4.17.1 and clause 4.17.2 of TS 23.502 [3] to support registering the extended UPF functionalities in NRF (including Sol#2, Sol#3, Sol#4, Solt#6).

- Extend the baseline UPF capabilities announced in N4 via the PFCP Association Setup (including Sol#3, Sol#4).

- Defining an open and generic value (e.g. octet string) which can be used for non-standard or partially supported features and configured by operator to extend the baseline UPF capabilities announced in N4 and UPF NF profile in NRF (Sol#3).

Following mechanisms have been indicated to enhance the UPF selection to support specific user plane functionalities:

- Support SMF provisioning of UPF and UPF discovery via the NRF as well as procedures in clause 4.17.6 of TS 23.502 [3] and clause 4.15.4.5.3 of TS 23.502 [3], respectively (including Sol#2, Sol#3, Sol#4, Sol#6).

- Enhancing UPF selection logic at SMF by dividing UPF capabilities into required and desired for the PDU Session so that the SMF selects a UPF for the PDU Session supporting all the required functionalities and most of the desired functionalities possible (Sol#4).

- SMF executes UPF selection based on the status of the supported functionalities in the UPF which has been informed by UPF via the NRF (Sol#6).

*NEXT CHANGE (all the text is new)*

# 8 Conclusions

## 8.X Key Issue #1: Selection of UPF providing a selected user plane functionality

The following aspects are concluded as principles for normative work:

- Reusing procedures in clause 4.17.1 and clause 4.17.2 of TS 23.502 [3] to support registering the extended UPF functionalities in NRF.

- The following UPF functionalities are added in UPF profile stored in NRF:

- NAT functionality, and the type of the NAT functionality e.g. static NAT, pooled NAT, NAPT, easy IP, and NAT server.

- Packet Inspection functionality, i.e., Layer 7 DPI with specific DPI levels, e.g. specific transport levels such as QUIC, MP-QUIC, MP-TCP, or application such as HTTP, RTP, SIP, WebRTC, etc..

- DDoS protection or Firewall.

- DNS snooping.

- Different hardware configurations (e.g. CPU or NIC (Network Interface Controller) that brings better capacity or latency characteristics).

- Defining an open and generic value (e.g. octet string) which can be used for non-standard or partially supported features and configured by operator to extend the baseline UPF capabilities announced in N4 and UPF NF profile in NRF.

- Enhancing UPF selection logic at SMF by dividing UPF capabilities into required and desired for the PDU Session so that the SMF selects a UPF for the PDU Session supporting all the required functionalities and most of the desired functionalities possible.Determining required and desired UPF capabilities for the PDU Session can be based on:

- Subscription data received from UDM for the PDU Session

- PCC rules/PDU Session related policy received from PCF for the PDU Session.

- SMF executes UPF selection based on the status of the supported functionalities in the UPF which has been informed by UPF via the NRF.

- Enhancing SMF to properly configure the selected UPF in order to activate/use the UPF functionalities for the PDU Session or service data flows.

\* \* \* \* End of changes \* \* \* \*