**3GPP TSG-SA5 Meeting #145-e *S5-225300***

**e-meeting, 15 - 24 August 2022**

**Source: Ericsson**

**Title: Adding solutions in clause 7.2 for trigger handling between visited and home CHF**

**Document for: Approval**

**Agenda Item: 7.5.3**

# 1 Decision/action requested

**Include the proposed changes in TR 28.827.**

# 2 References

[1] 3GPP TR 28.827: "Study on 5G charging for additional roaming scenarios and actors"

# 3 Rationale

Adding solutions in clause 7.2 for trigger handling between vCHF and hCHF based on roaming charging profile and the trigger ordinary settings in the response, both set by the hCHF through the vCHF.

# 4 Detailed proposal

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| **First change** |

#### 7.2.4.x Solution #2.x: Roaming charging profile exchanged between VPLMN and HPLMN

##### 7.2.4.x.1 General

A possible solution for key issue #2e covering requirements REQ-CH\_CVTOH-01, and REQ-CH\_CVTOH-02, trigger handling between visited CHF and home CHF, is to use the roaming charging profile.

Editor’s Note: The solution #2,1 where V-CHF communicate with H-CHF is FFS.

##### 7.2.4.x.2 Reference architecture

The reference architecture would be the same as in solution #2.1 clause 7.2.4.1.

##### 7.2.4.x.3 Message flows

The “Roaming charging profile” may only be set or changed at PDU session establishment or PDU session transfer from a different VPLMN. It may at this point be set, changed, applied, and transferred in the following order:

1. Default set by V-SMF and transferred to V-CHF

2. Changed by V-CHF and transferred to H-CHF

5. Changed by H-CHF and transferred to V-CHF

3. Transferred from V-CHF to V-SMF

6. Applied in V-SMF

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| **Second change** |

#### 7.2.4.y Solution #2.y: Triggers sent from H-CHF through V-CHF

##### 7.2.4.y.1 General

A possible solution for key issue #2e covering requirements REQ-CH\_CVTOH-01, and REQ-CH\_CVTOH-02, trigger handling between visited CHF and home CHF, is to require that all triggers are sent through the V-CHF from the H-CHF which would allow both the H-CHF and V-CHF to influence the trigger setting towards the SMF or other NFs that can act as a CTF. This solution would also require that any Charging data request from the NF (CTF) would in the trigger a new request from the V-CHF towards the V-CTF. There is a one-to-one relationship between the requests towards the H-CHF and V-CHF, and only a single session towards the NF (CTF).

##### 7.2.4.y.2 Reference architecture

The reference architecture would be the same as in solution #2.1 clause 7.2.4.1.

##### 7.2.4.y.3 Message flows

Figure 7.2.4.y.3-1 shows a scenario for a Charging data request [Initial] using Session Based Charging (SBC) with CHF-to-CHF communication. Applicable for SMF, SMSF, and AMF.



Figure 7.2.4.y.3-1: SBC - Session based charging with CHF-to-CHF communication, initial

**1) Request for service delivery:** A request for session establishment is received in the NF (CTF). The service is configured to be authorized by the V-CHF before start.

**2) Charging data request [Initial]:** NF (CTF) sends a request to V-CHF for service to be granted authorization to start, this may include a request for units.

**3) Determine H-CHF:** V-CHF determines that it need to interact with H-CHF for the authorization of the service as well as which H-CHF, trigged by the reception of the Charging data request.

**4) Charging home request [Initial]:** V-CHF sends a request to H-CHF for service to be granted authorization to start, this may include a quota request.

**5) Account, Rating, Reservation control:** H-CHF determines which triggers it would need to have enabled or disabled. The H-CHF may also rate the request and check if corresponding funds can be reserved on the user's account balance.

**6) Open CDR:** based on policies, H-CHF opens a CDR related to the service.

**7) Charging home response [Initial, Triggers]:** H-CHF grants authorization to V-CHF with the requested trigger setting, if any. It may include granted units.

**8) Open CDR:** based on policies, V-CHF opens a CDR related to the service which may include V-CHF requested triggers. V-CHF may change H-CHF triggers requested, depending on roaming agreement.

**9) Charging data response [Initial, Triggers]:** The V-CHF grants authorization to NF (CTF) for the service to start, with trigger setting and any granted units if provided by the H-CHF.

**10) Start of service delivery:** the NF (CTF) starts to deliver the service with the requested triggers being monitored.

Figure 7.2.4.y.3-2 shows a scenario for a Charging data request [Update] using Session Based Charging (SBC) with CHF-to-CHF communication. Applicable for SMF.



Figure 7.2.4.y.3-2: SBC - Session based charging with CHF-to-CHF communication, update

**1) Service delivery ongoing:** A session is established, and service delivery is ongoing in NF (CTF).

**2) Trigger condition met:** A request for session establishment is received in the NF (CTF). The service is configured to be authorized by the V-CHF before start.

**3) Charging data request [Update]:** NF (CTF) sends the request to the V-CHF for the service to be granted authorization to continue, this may include a request for units.

**4) Charging home request [Update]:** The V-CHF have a charging session ongoing with the H-CHF, V-CHF sends the request to the H-CHF for the service to be granted authorization to continue, this may include a quota request.

**5) Account, Rating, Reservation control:** H-CHF determines which triggers it would need to have enabled or disabled. The H-CHF may also rate the request and check if corresponding funds can be reserved or deducted on the user's account balance.

**6) Update CDR:** based on policies, the H-CHF updates the CDR related to the service.

**7) Charging home response [Update, Triggers]:** The H-CHF grants authorization to V-CHF with the trigger setting required and it may include granted units.

**8) Update CDR:** based on policies, V-CHF updates the CDR related to the service which may include V-CHF requested triggers. V-CHF may change H-CHF triggers requested, depending on roaming agreement.

**9) Charging data response [Update, Triggers]:** The V-CHF grants authorization to NF (CTF) for the service to start, with the granted units and trigger setting from the H-CHF.

**10) Continue service delivery:** the NF (CTF) continues to deliver the service with the requested triggers being monitored.

For the Charging data request [Termination] using Session Based Charging (SBC) with CHF-to-CHF communication scenario for a, there is no need to send any trigger settings since the charging session is being terminated.

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| **End of changes** |