**3GPP TSG-SA5 Meeting #146Bis-e *S5-231136***

Electronic meeting, 16 - 19 January 2023

**Source: Ericsson**

**Title: Adding comparison between double or single CHF**

**Document for: Endorsement**

**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

There are basically three different potential architectures, where one CTF (AMF, SMF and SMSF) have for one chargeable event/session:

A. two charging events/sessions, one to each of V-CHF and H-CHF.

B. two charging events/sessions to V-CHF, the V-CHF forwards one of these to H-CHF

C. one charging events/sessions to V-CHF, the V-CHF creates one new charging event/session to H-CHF

There is a fourth variant (D) which is a mix between B and C, where the CTF would only have one chargeable/event session towards the V-CHF but would sperate the information sent to V-CHF and the information to be forwarded to the H-CHF.

For potential architecture A the service used would be the Nchf\_ConvergedCharging for both charging events/sessions, while for potential architectures B and C this doesn’t have to be the case. The comparison assumes that the Nchf\_ConvergedCharging is used for all potential architectures i.e., between CTF and CHFs as well as between CHFs.

All potential architectures add latency, how much will to a large extent depend on the interaction with the HPLMN. Using the non-blocking mode could mitigate it to some extent but have other cons.

# 4 Detailed proposal

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| **First change** |

### 7.2.5 Evaluation

Solutions #2.2 and #2.1 both solves key issues #2a and #2b and covers requirements REQ-CH\_CVTOH-01, and REQ-CH\_CVTOH-02. Solution #2.1 solves more key issues and covers more requirements, and #2.2 is already supported in the scope of 5G connectivity charging.

Solutions #2.4, #2.1, #2.16 all solves key issues #2f and #2g and covers requirements REQ-CH\_CVTOH-03, and REQ-CH\_CVTOH-04. Solution #2.1 solves more key issues and covers more requirements, and #2.16 is already supported in the scope of SMS charging as is.

Solutions #2.5 and #2.1 both solves key issues #2h and #2i and covers requirements REQ-CH\_CVTOH-05, and REQ-CH\_CVTOH-06. Solution #2.1 solves more key issues and covers more requirements and #2.5 is already supported in the scope of 5G connection and mobility charging as is.

Solutions #2.8 and 2.9 both solves key issues #2c, both require solution #2.1 or #2.3, and can be supported at the same time depending on the need and capability of the V-CHF.

Solutions #2.6 and #2.7 both solves key issues #2d.

Solutions #2.10, #2.11 and #2.12 all solves key issues #2e.

Editor’s note: Further evaluations are FFS.

##### 7.2.5.x Comparison of potential architectures

Comparison of the four different potential architectures, where one CTF (AMF, SMF and SMSF) have for one chargeable event/session:

A. two charging events/sessions, one to each of V-CHF and H-CHF, solutions #2.2, #2.4, and #2.5.

B. two charging events/sessions to V-CHF, the V-CHF forwards one of these to H-CHF, solution #2.x.

C. one charging events/sessions to V-CHF with single charging information, the V-CHF creates one new charging event/session to H-CHF, solution #2.1 and #2.13

D. one charging event/session towards the V-CHF with dual charging information or information elements, the V-CHF creates one new charging event/session to H-CHF, solution #2.14 and #2.15

Table 4-1: Comparison potential architectures

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| Proposal | Pros | Cons |
| A | - Already specified for some NFs- From H-CHF view like home routed roaming- From V-CHF view like home routed roaming | - Additional CTF handling- NF and vendor specific failure handling- No support of more than two CHFs, if required- Synchronization of rating groups |
| B | - Could reuse what is specified for A- From H-CHF view like home routed roaming- The monitoring and logging of the interaction can be specified | - Additional CTF handling- NF and vendor specific failure handling- Synchronization of rating groups- Using V-CHF as a routing agent i.e., the CHF needs to be able to act as a Nchf consumer |
| C | - From H-CHF view like home routed roaming- From CTF view like home routed roaming (simplification)- V-CHF could be used to translate rating groups- The monitoring and logging of the interaction can be specified- Allows the VPLMN to influence what the HPLMN is receiving and requesting- Supports more than two CHFs | - Additional speciation- Additional handling in V-CHF i.e., the CHF needs to be able to act as a Nchf consumer |
| D | See B, except for the possibility to reuse what is specified for A |