**3GPP TSG-SA5 Meeting #146Bis-e *S5-231111***

Electronic meeting, 16 - 19 January 2023

**Source: Ericsson**

**Title: Correcting use cases and key issues in clause 5.1**

**Document for: Approval**

**Agenda Item: 7.5.2**

# 1 Decision/action requested

**Include the proposed changes in TR 28.826.**

# 2 References

[1] 3GPP TR 28.826: " Study on Nchf charging services phase 2 improvements and optimizations"

# 3 Rationale

Adding link to requirements and key issues from use cases and updating key issue format.

# 4 Detailed proposal

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| **First change** |

### 5.1.2 Use cases

#### 5.1.2.1 Use Case #1a: Trigger without usage

The operator has an offer for 5G data connectivity, which is volume based and available for both online and offline (in converged charging this means quota and not quota managed) charged subscribers. The offer has different rates depending on the PLMN accessed i.e., if it is roaming and where it is roaming. The operator would also like to get statics on how much the users are using in different PLMNs, as well as for some IoT devices how many times they change PLMN.

A user has a UE that has a PDU session ongoing and is on the border between HPLMN and VPLMN and the UE keeps switching between the networks. The user chooses to only use the UE when it is connected to the HPLMN.

An enterprise has several IoT devices that each have their PDU sessions ongoing.

The operator would like to minimize the number of interrogations and the information sent between the SMF and CHF, this means that this means that for:

- UEs that are online (quota managed) charged and have the offer, a PLMN change should only immediately trigger a CHF when there is usage.

- UEs that are offline (not quota managed) charged and have the offer, a PLMN change should create a container only when there is usage.

- some IoT devices that are offline (not quota managed) charged, a PLMN change should create a container independent of if there is usage or not.

This could be relevant for the following triggers: QoS, GFBR guaranteed status, user location, serving node, Presence Reporting Area(s), 3GPP PS data off status, tariff time, UE time zone, PLMN, RAT type, Session-AMBR, UPF, I-SMF, handover status, access addition/removal and redundant transmission change.

Potential charging requirement for the use case is REQ-CH\_INFO-01 and key issues are #1a, #1b, and #1c.

#### 5.1.2.2 Use Case #1b: Size of charging information

The operator has a number of CHFs wants to optimize their storage and would therefore like to control the size of the converged charging requests based on the available space in each CHF. It should be noted that there is a trade of between size of the requests and the number of requests.

There are two parts of to the storage in the CHF one is the CDR storage before sending it to the CGF and the allocation of the resource for the SBI. The resource may be stored uncompressed for fast access, whereas the charging information in the converged charging request may be compressed to limit network utilization. This means that the operator would like to control the size of the message both before and after the compression.

When a converged charging request is sent the amount of information included in the intimal is often limited since not much usage can have been done, so it is more important to be able to control the sizes of the update and termination than the initial.

The converged charging request can contain request for units, offline unit reports and online units report for the same rating group.

Potential charging requirement for the use case is REQ-CH\_INFO-02 and key issues are #1d and #1e.

#### 5.1.2.3 Use Case #1c: Charging Data Request Optimization

The operator has an offer for 5G Data Connectivity, which is volume based, though, this needs to be clearly optimized due to the expected number of IoT devices which an enterprise can have. Each one of the IoT devices may have a PDU session which could lead a major 5GS overload due to burst of Charging Data Requests.

The operator would like to minimize the number of interrogations and the information sent between the SMF and CHF, by:

- Simplify charging for loT devices

- Protect 5GS from charging system overload due to many CDRs

Potential charging requirement for the use case is REQ-CH\_INFO-03 and key issues are #1f and 1g.

#### 5.1.2.4 Use Case #1d: Undefined RAT type

An End User (subscriber) uses a service with a RAT type has that isn’t supported by the CDR. The SMF reports the usage with the RAT type. The CHF will not be able to store the RAT type in the CDR and since it is optional it may discard the value.

Potential charging requirement for the use case is REQ-CH\_INFO-04 and key issues are #1h and #1i.

#### 5.1.2.5 Use Case #1e: Charging information accuracy of location

The operator has an offering service for subscribers, e.g., 5G data connectivity service specified in the TS 32.255[2], which is volume based charging. During the 5G data connectivity service consumption, the charging information is collected by the SMF and reported to the CHF when the triggers is encountered. That means whether the CHF can accurately charge for subscribers depends on the received charging information from SMF is correct or not.

Potential charging requirement for the use case is REQ-CH\_INFO-05 and key issue is #1j.

#### 5.1.2.6 Use Case #1f: Bitrate charging

The operator has an offer for 5G data connectivity services charged subscribers to provide the tiered charging per bitrate.

The end user subscribes the volume/time based tiered charging based on the averaged bitrate per time interval with special range (High speed/middle or low downlink or uplink). In order to make sure the user experience, the 5G system collects the statistics on traffic volume by averaged bitrate per time interval to implement tiered charging per bitrate.

Account the volume or time based on the range for the averaged bitrate per time interval.

Potential charging requirement for the use case is REQ-CH\_INFO-06 and key issue is #1k..

#### 5.1.2.7 Use Case #1g: Charging information for threshold based re-authorization triggers

When received quota threshold based re-authorization triggers (i.e. timeQuotaThreshold, volumeQuotaThreshold, unitQuotaThreshold), the NF consumer shall seek re-authorization for the quota when fall below the supplied threshold. The NF consumer allows the service to continue whilst the re-authorization is progress, until the remaining part had been used up. The description in the TS 32.290 [x] clause 5.4.2 about the Threshold based re-authorization triggers is unclear.

Potential charging requirement for the use case is REQ-CH\_INFO-07 and key issue is #1l..

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| **Second change** |

### 5.1.4 Key issues

**Key Issue #1a:** Identify the charging scenarios and triggers which can be controlled when there is no usage.

**Key Issue #1b:** How to control if information is sent when there is no usage.

**Key Issue #1c:** How to control if containers are created when these is no usage.

**Key Issue #1d**: How to control the size of the information in the converged charging request, dependent or independent of compression.

**Key Issue #1e:** How to handle when unit request and report for one rating group are split over several requests

**Key Issue #1f:** Identify the charging scenarios for small data delivery

**Key Issue #1g:** How to optimize small data delivery charging requests

**Key Issue #1h:** Where in CDR structure to store undefined values

**Key Issue #1i:** How to determine where the attribute belongs in the CDR structure

**Key Issue #1j:** How to ensure the charging information accuracy of location.

**Key Issue #1k:** How to handle tiered charging based on averaged bitrate per time interval.

**Key Issue #1l:** How to handle the remaining granted quotas during the re-authorization.

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| **End of changes** |