**3GPP TSG-SA5 Meeting #146Bis-e *S5-231134***

Electronic meeting, 16 - 19 January 2023

**Source: Ericsson**

**Title: Adding solution in clause 7.6 for UE usage information reporting**

**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"

[2] 3GPP TS 32.240: "Charging management; Charging architecture and principles".

[3] 3GPP TS 32.277: "Charging management; Proximity-based Services (ProSe) charging".

# 3 Rationale

Adding solution in clause 7.6 for reconciliation using the UE to collect some usage information. This usage information may be used to check some of the records received from the visited MNO by the home MNO, with data that cannot be influenced by the visited MNO.



Figure 3.1: Logical ubiquitous charging architecture and reference points with distributed functional blocks of CTF for offline charging

For a service utilizing the distributed CTF, the CTF is divided into two functional blocks as described in TS 32.240 [2] clause 4.3.1.1. The Accounting Metrics Collection (AMC) function block is in the UE that supports the specific service. The AMC sends usage information collected to the Accounting Data Forwarding (ADF) function block of the CTF in the service NE over the service-specific reference point, denoted as X. The subset of X specific to usage information collection for charging purposes is denoted as Xch in figure 3.1.

The reference point X between the UE and the Service NE will depend on the Service NE, in ProSe TS 32.277 [3] this correspond to the PC3a i.e., the reference point between UE and 5G DDNMF, and the refence point between the charging specific subset is named PC3ach. The PC3a relies on 5GC user plane for transport (i.e. an "over IP" reference point).

# 4 Detailed proposal

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| **First change** |

#### 7.6.4.x Solution #6.x: Using UE usage information reporting

##### 7.6.4.x.1 General

A possible solution for key issue #6a covering requirements REQ-CH\_RECON-01, would be to have selected UEs collect usage information and report this to the home MNO. This collected usage information could be used to do partial reconciliation between the UE reported and the visited reported usage, this since having all UEs doing local breakout reporting usage may not be feasible.

This could use the distributed charging trigger function mechanism described in TS 32.240 [12] annex D. The UE would use Accounting Metrics Collection (AMC) to do usage information reports towards the Accounting Data Forwarding (ADF) located in a new NF in the home MNO.

##### 7.6.4.x.2 Reference architecture

It would mean that there is a need to adapt the architecture described in TS 32.240 [12] annex D to a service-based architecture. The new NF holding the CTF (ADF) would interact with the CHF use a new reference point Nx which would in turn would rely on Nchf\_ConvergedCharging service to interact with the CHF. The UE CTF (AMC) would use another new reference point Nych to communicate with the new NF CTF (ADF). The Nych would rely on 5GC user plane for transport (i.e., an "over IP" reference point).



Figure 7.6.4.x.2-1: Reconciliation using UE usage reporting in reference point representation



Figure 7.6.4.x.2-2: Reconciliation using UE measurements in service-based interface representation

##### 7.6.4.x.3 Message flows

This assumes that the UE would be configured with the address of the new NF which holds the CTF (ADF) to be able to know where to send the reports.



Figure 7.6.4.x.3-1: Message flows for UE usage reporting - PEC

1. UE is configured with reporting to the NewNF, this would include NewNF address and reporting criteria. The reporting triggers criteria could be based on e.g., PLMNs, volumes. Both the NewNF address, and reporting criteria could be provisioned to the UE when the UE is allowed to do local breakout roaming.

2. UE (CTF-AMC) decides that reporting criteria are met, according to the configuration, the UE (CTF-AMC) creates the corresponding usage information report.

3. UE triggers the usage reporting procedure sends the usage information report to the NewNF (CTF-ADF).

4. NewNF decides that a charging trigger is met, this can be due to a reception of a usage information report from the UE (CTF-AMC), or some internal trigger e.g., after a number of received reports from the UE.

4ch-a. NewNF (CTF-ADF) triggers the Charging data request [Event] and sends it to CHF.

4ch-b. CHF opens a CDR for storing the usage information from the UE.

4ch-c. CHF acknowledges by sending Charging data response [Event] to the NewNF (CTF-ADF).

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| **End of changes** |