**3GPP TSG-SA5 Meeting #142-e *S5-222423rev3***

**e-meeting, 4th – 12th April 2022** Revision of S5-20xxxx

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| *CR-Form-v12.1* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **32.255** | **CR** | **0** | **rev** | **1** | **Current version:** | **17.5.0** |  |
|  | | | | | | | | |
| *For* [***HELP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* | | | | | | | | |
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| ***Proposed change affects:*** | UICC apps |  | ME |  | Radio Access Network |  | Core Network | **X** |

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| ***Title:*** | Additional converged charging architecture for LBO | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Huawei, Vodafone | | | | | | | | | |
| ***Source to TSG:*** | S5 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | CHROAM | | | | |  | ***Date:*** | | | 2022-04-08 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | B |  | | | | | ***Release:*** | | | Rel-17 |
|  | *Use one of the following categories:* ***F*** *(correction)* ***A*** *(mirror corresponding to a change in an earlier release)* ***B*** *(addition of feature),* ***C*** *(functional modification of feature)* ***D*** *(editorial modification)*  Detailed explanations of the above categories can be found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | | | | | | | | *Use one of the following releases: Rel-8 (Release 8) Rel-9 (Release 9) Rel-10 (Release 10) Rel-11 (Release 11) … Rel-15 (Release 15) Rel-16 (Release 16) Rel-17 (Release 17) Rel-18 (Release 18)* | |
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| ***Reason for change:*** | | For the support of local breakout roaming scenario charging, the general description about local breakout roaming scenario charging and charging architecture is introduced. | | | | | | | | |
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| ***Summary of change:*** | | Add the converged charging architecture for the support of local breakout roaming scenario charging. | | | | | | | | |
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| ***Consequences if not approved:*** | | The support of the local breakout roaming scenario charging is incomplete. | | | | | | | | |
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| ***Clauses affected:*** | | 4.2 | | | | | | | | |
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|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | |  | **X** | Other core specifications | | | | TS/TR ... CR ... | | |
| ***affected:*** | |  | **X** | Test specifications | | | | TS/TR ... CR ... | | |
| ***(show related CRs)*** | |  | **X** | O&M Specifications | | | | TS/TR ... CR ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

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| **First change** |

## 4.2 5G data connectivity domain converged charging architecture

The SMF embedding the CTF, generates charging events towards the CHF for PDU connectivity converged charging or offline only charging.

As described in TS 32.240 [1], the CTF generates charging events towards to the CHF for converged online and offline charging processing. The CDRs generation is performed by the CHF acting as a CDF, which transfers them to the CGF.   
Finally, the CGF creates CDR files and forwards them to the BD.

If the CGF is external, the CHF acting as a CDF, forwards the CDRs to the CGF across the Ga interface.   
If the CGF is integrated, there is only one internal interface between the CHF and the CGF. In this case, the relationship between CHF and CGF is 1:1. An integrated CGF may support the Ga interface from other CDFs.

When an external CGF is used, this CGF may also be used by other, i.e. non-5GCS, network elements, according to network design and operator decision. It should be noted that the CGF may also be an integrated component of the BD – in this case, the Bd interface does not exist and is replaced by a proprietary solution internal to the BD.

Figure 4.2.1 depicts the architectural options for converged charging in service-based representation for CHF.



**Figure 4.2.1: 5G data connectivity converged charging architecture**

Architectural options of figure 4.2.1 apply to any 5G data connectivity converged charging architectures in this clause.

Ga is described in clause 5.2.4 and Bd in clause 5.2.5. of the present document and Nchf is described in TS 32.290 [57]..

Figure 4.2.2 depicts the 5G data connectivity converged charging architecture in reference point representation for non-roaming:



Figure 4.2.2: 5G data connectivity converged charging architecture non-roaming reference point representation

Figure 4.2.3 depicts the 5G data connectivity converged charging architecture service-based representation for roaming Home Routed:



Figure 4.2.3: 5G data connectivity converged charging architecture roaming Home Routed service based representation

Figure 4.2.4 depicts the 5G data connectivity converged charging architecture for roaming Home Routed in reference point representation:



Figure 4.2.4: 5G data connectivity converged charging architecture in roaming Home routed reference point representation

The N40 reference point is defined for the interactions between H-SMF and H-CHF and between V-SMF and V-CHF in the reference point representation.

Figure 4.2.X depicts the 5G data connectivity converged charging architecture service-based representation for roaming Local Breakout:



Figure 4.2.X: 5G data connectivity converged charging architecture roaming Local Breakout scenario service based representation

Figure 4.2.Y depicts the 5G data connectivity converged charging architecture for roaming Local breakout in reference point representation:



Figure 4.2.Y: 5G data connectivity converged charging architecture in Local breakout scenario reference point representation

The N40 reference point is defined for the interactions between V-SMF and V-CHF, the N47 reference point is defined for the interactions between V-SMF and H-CHF and in the reference point representation.

For scenarios with MVNO (owning a CHF referred to as A-CHF) non-roaming, the N40 reference point is defined for the interactions between SMF and CHF owned by MNO, the N47 reference point is used for the interactions between SMF owned by the MNO and A-CHF owned by the MVNO in the reference point representationn.

N47 used by A-CHF owned by an additional actor (i.e. MVNO) to perform retail charging for its own subscribers is operator specific.

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| **End of change** |