**3GPP TSG-SA WG6 Meeting #45 S6-211970**

**e-meeting, 25th August – 3rd September 2021 (revision of S6-21xxxx)**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *CR-Form-v12.1* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **23.558** | **CR** | **0032** | **rev** | **-** | **Current version:** | **17.0.0** |  |
|  | | | | | | | | |
| *For* [***HE******LP***](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)*.* | | | | | | | | |
|  | | | | | | | | |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ***Proposed change affects:*** | UICC apps |  | ME | **X** | Radio Access Network |  | Core Network | **X** |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | | | | | | | | | | |
| ***Title:*** | ENs in clause 6.2 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Samsung | | | | | | | | | |
| ***Source to TSG:*** | S6 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | EDGEAPP | | | | |  | ***Date:*** | | | 2021-08-19 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | F |  | | | | | ***Release:*** | | | 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)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | Deployment options for ECS are already captured in clause 6.3.4. Also, note that deployment of ECS in MNO domain does not require use of control plane between the EEC and the ECS over EDGE-4.  Use of user plane for EDGE-4 satisfies all the requirements of EDGE-4 interface in all ECS deployments (i.e MNO and 3rd party deployments); while use of control plane leads to multiple issues such as:   * **Control plane option does not work in all deployments** but only for MNO deployed ECSs. * Use of control plane **requires a middleware/parser in the UE** to deliver the information to the EEC as control plane terminates at a lower layerin the UE while service provisioning information is application layer information. * If control plane is used any **EDGE-4 update will require complex UE (OS/firmware) and Network Function upgrades** for the lower layers, depending on its implementation. * It will lead to **duplication of functionality** at the EEC to support both user plane and control plane based mechanisms; implemenations will not be clear as to which mechanism should be used and when. * Support for **control plane is not possible in 4G networks** – this will result in further confusion for EEC implementations and network management. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | The EN on ECS deployment is removed and the following NOTE is captured, pointing to clause 6.3.4 for different deployment options for the ECS:  NOTE: Different deployment choices for ECS are captured in clause 6.3.4. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | Superfluous ENs in the architecture clause will lead to unnecessary confusion. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 6.2 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **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:*** | |  | | | | | | | | |

\* \* \* First Change \* \* \* \*

## 6.2 Architecture

This clause describes the architecture for enabling edge applications in the following representations:

- A service-based representation, where the Edge Enabler Layer functions (e.g. ECS) enable other authorized Edge Enabler Layer functions (e.g. EES) to access their services. This representation also includes point-to-point reference points where necessary;

- A service-based representation as specified in 3GPP TS 23.501 [2], where the Network Functions (e.g. NEF) enable authorized Edge Enabler Layer functions (e.g. ECS) i.e. Application Functions, to access their services;

- A service-based representation, where the Core Network Northbound APIs as specified in 3GPP TS 23.501 [2] and 3GPP TS 23.502 [3], are utilized by authorized Edge Enabler Layer functions via CAPIF core function specified in 3GPP TS 23.222 [6]; and

- A reference point representation, where existing interactions between any two functions (e.g. EES, ECS) is shown by an appropriate point-to-point reference point (e.g. EDGE-6, EDGE-7).

Edge Enabler Layer functions shown in the service-based representation of the edge architecture shall only use service-based interfaces for their interactions.

Figure 6.2-1 illustrates the service based representation of architecture for enabling edge applications.



Figure 6.2-1: Architecture for enabling edge applications - service-based representation

NOTE: The EEC function and EAS function in figure 6.2-1 do not expose any service to the other functions.

Editor's note: Whether the meaning of the term SBA in this clause needs to be modified based upon the above representation is FFS.

NOTE: Different deployment choices for ECS are captured in clause 6.3.4.

The mechanisms for service discovery in the SBA represented by figure 6.2-1 are as follows:

- The EES discovers the ECS via pre-configuration or by using CAPIF as specified in 3GPP TS 23.222 [6];

- The EAS discovers the EES via pre-configuration or by using CAPIF as specified in 3GPP TS 23.222 [6];

- The EAS discovers the other EAS(s) as specified in clause 8.8.3.2;

- The EEC discovers the ECS as specified in clause 8.3.2; and

- The EEC discovers the EES via service provisioning as specified in clause 8.3.3.

Figure 6.2-2 illustrates the service-based representation for utilization of the 5GS network services based on 5GS SBA specified in 3GPP TS 23.501 [2].



Figure 6.2-2: Utilization of 5GS network services based on 5GS SBA – service based representation

The ECS, EES and EAS acts as AFs for consuming network services directly from the 3GPP 5G Core Network entities over the service based architecture specified in 3GPP TS 23.501 [7].

The ECS, EES and EAS can consume network services from the 5GS SBA as represented in the figure 6.2-2 and interact in the SBA represented in figure 6.2-1.

Figure 6.2-3 illustrates the service-based representation for utilization of the Core Network (5GC, EPC) northbound APIs via CAPIF.



Figure 6.2-3: Utilization of Core Network Northbound APIs via CAPIF – service based representation

The ECS, EES and EAS act as authorized API invoker to consume services from the Core Network (5GC, EPC) northbound API entities like SCEF, NEF, SCEF+NEF which act as API Exposing Function as specified in 3GPP TS 23.222 [6].

The mechanism for northbound APIs discovery in the SBA represented by figure 6.2-3 is as specified in 3GPP TS 23.222 [6].

The ECS, EES and EAS can consume Core Network northbound APIs via CAPIF as represented in the figure 6.2-3 and interact in the SBA represented in figure 6.2-1.

Figure 6.2-4 illustrates the reference point representation of the architecture for edge enabling applications.



Figure 6.2-4: Architecture for enabling edge applications - reference points representation

The EDN is a local Data Network. EAS(s) and the EES are contained within the EDN. The ECS provides configurations related to the EES, including details of the EDN hosting the EES. The UE contains AC(s) and the EEC. The EAS(s), the EES and the ECS can interact with the 3GPP Core Network.