**3GPP TSG-SA WG6 Meeting #44 S6-211xxx**

**e-meeting, 12th– 20th July 2021 (revision of S6-211691)**

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| *CR-Form-v12.1* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **23.255** | **CR** | **0005** | **rev** | **1** | **Current version:** | **17.0.1** |  |
|  | | | | | | | | |
| *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)*.* | | | | | | | | |
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| ***Proposed change affects:*** | UICC apps |  | ME | **X** | Radio Access Network |  | Core Network | **X** |

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| ***Title:*** | Alignment with 5GC architecture | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Huawei, Hisilicon | | | | | | | | | |
| ***Source to TSG:*** | S6 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | UASAPP | | | | |  | ***Date:*** | | | 2021-07-01 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **F** |  | | | | | ***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)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | The architecture reference model of UAS for 5GC is specified in TS 23.256. The functional model specified in 23.255 is to be aligned. | | | | | | | | |
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| ***Summary of change:*** | | The functional model specified in clause 5.2 is aligned with the 5GC. | | | | | | | | |
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| ***Consequences if not approved:*** | | The UASAPP functional model will be misaligned with 5GC. | | | | | | | | |
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| ***Clauses affected:*** | | 5.2 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | |  | **N** | Other core specifications | | | | TS/TR ... CR ... | | |
| ***affected:*** | |  | **N** | Test specifications | | | | TS/TR ... CR ... | | |
| ***(show related CRs)*** | |  | **N** | O&M Specifications | | | | TS/TR ... CR ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

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

## 5.2 Functional model description

Figures 5.2-1 and 5.2-2 illustrates the simplified architectural models for the UAS application layer.



Figure 5.2-1: Simplified architectural model for the UAS application layer



Figure 5.2-2: Simplified architectural model for U2 connectivity between UAS UE1 and UAS UE2 at the UAS application layer

The UAS UE1 communicates with UAS application server over U1 reference point. The UAS UE1 and UAS UE2 communicate over U2 reference point.

NOTE 1: Support for UE-to-network relay architecture for UAS communications is out of scope of the present document.

The UAS UE1 and the UAS UE2 may be a UAV Controller or a UAV.

NOTE 2: The UAV Controller can connect to the UAV via a transport independent of 3GPP. Such UAV Controller is not a 3GPP UE and is out of scope of the present document.

NOTE 3: Support of PC5 at the U2 reference point for 5GS is out of scope of the present document.

The reference point U1 supports the UAS application related interactions between UAS UE and UAS application server. It is expected that this reference point is supported at least for unicast delivery mode, and may support multicast delivery mode. The reference point U2 supports the interactions between the UAS UEs. The UAS application server can be the USS/UTM.

The reference point U1 is based on Uu connectivity as specified in 3GPP TS 23.256 [4].

The reference point U2 is based on Uu connectivity as specified in 3GPP TS 23.256 [4].

NOTE 4: Support of multicast delivery over Uu for 5GS is out of scope of the present document.

Figure 5.2-3 illustrates the detailed UAS application layer functional model. It enhances the simplified architectural model for the UAS application layer by specifying the functional entities at the UAS application layer.



Figure 5.2-3: UAS application layer functional model

Figure 5.2-4 illustrates the detailed UAS application layer functional model where the UAV-C has a network‑assisted connectivity with the UAV.



Figure 5.2-4: UAS application layer functional model with UAV-C having network-assisted connectivity with UAV

The UAS application layer functional entities for the UAS UE and the UAS application server are grouped into the UAS application specific layer and the UAE layer. The UAE layer offers the UAE capabilities to the UAS application specific layer. The UAS application layer functional model utilizes the SEAL services as specified in 3GPP TS 23.434 [5].

The UAE server is located in the UAE layer. The SEAL services/UAS application specific layer utilized by UAE layer may include location management, group management, configuration management, identity management, key management and network resource management. The UAS application specific layer consists of the UAS application specific functionalities.

NOTE 5: The functionalities of the UAS application specific layer include the USS/UTM and are out of scope of the present document.

The following connectivity path for the UAS is supported when both the UAV-C and the UAV are 3GPP UEs:

- UAV-C to UAV over U2 (Uu connectivity).

The UAS application server consists of the UAE server, the SEAL servers and the UAS application specific server. The UAE server provides the UAS application layer support functions to the UAS application specific server over Us reference point. The SEAL servers provide the SEAL services to the UAS application specific server/UAE server over SEAL-S reference point.

The UAS UE consists of the UAE client, the SEAL clients and the UAS application specific client. The UAE client provides the UAS application layer support functions to the UAS application specific client over Uc reference point. The SEAL clients provide the SEAL services to the UAS application specific client/UAE client over SEAL-C reference point.

NOTE 6: In some deployments, the client and server entities of SEAL can be part of UAE client and UAE server respectively.

The UAS application specific client/UAE client acts as a VAL client for its interaction with the SEAL clients as specified in 3GPP TS 23.434 [5]. The UAS application specific server/UAE server acts as a VAL server for its interaction with the SEAL servers as specified in 3GPP TS 23.434 [5].

In the UAE layer, the UAE client communicates with the UAE server over U1-AE reference point. In the UAS application specific layer, the UAS application specific client communicates with UAS application specific server over U1-APP reference point.

NOTE 7: The U1-APP reference point includes UAV Controller/UAV to USS/UTM communication and is out of scope of the present document.

In the UAE layer, the UAE client of UAS UE2 communicates with UAE client of UAS UE1 over U2-AE reference point. In the UAS application specific layer, the UAS application specific client of UAS UE2 communicates with UAE client of UAS UE1 over U2-APP reference point.

NOTE 8: The U2-APP reference point is out of scope of the present document.

The following SEAL services for UAS applications may include:

- Location management as specified in 3GPP TS 23.434 [5];

- Group management as specified in 3GPP TS 23.434 [5];

- Configuration management as specified in 3GPP TS 23.434 [5];

- Identity management as specified in 3GPP TS 23.434 [5];

- Key management as specified in 3GPP TS 23.434 [5]; and

- Network resource management as specified in 3GPP TS 23.434 [5].

The UAS application specific client/UAE client interacts with SEAL clients over the SEAL-C reference point specified for each SEAL service. The UAS application specific server/UAE server interacts with SEAL servers over the SEAL-S reference point specified for each SEAL service. The interaction between the SEAL clients is supported by SEAL-PC5 reference point specified for each SEAL service. The interaction between a SEAL client and the corresponding SEAL server is supported by SEAL-UU reference point specified for each SEAL service.

NOTE 9: The SEAL-C, SEAL-S, SEAL-PC5, SEAL-UU reference points for each SEAL service is specified in 3GPP TS 23.434 [5].

To support distributed UAE server deployments, the UAE server interacts with another UAE server over UAE-E reference point.

A U1-AE message can be sent over at least unicast, and may be sent over transparent multicast via xMB or transparent multicast via MB2. The non-transparent multicast via xMB (as specified in 3GPP TS 26.348 [10]) is triggered by a U1-AE message. Multicast distribution can be supported by both transparent and non-transparent multicast modes.

The UAE server interacts with the 3GPP network system over U2, MB2, xMB, Rx, T8 and Nnef reference points.

Editor's note: The service-based representation of UAS application layer functional model is FFS.

Editor's note: The term "functional model" vs. "architecture" needs further consideration.