**3GPP TSG-SA WG6 Meeting #52-bis-e S6-23aaaa**

**e-meeting, 11th – 20th January 2023 (revision of S6-23xxxx)**

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| *CR-Form-v12.2* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  |  | **CR** |  | **rev** |  | **Current version:** |  |  |
|  | | | | | | | | |
| *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:*** | Addition of IEs to messages related with change of USS | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** |  | | | | | | | | | |
| ***Source to TSG:*** |  | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** |  | | | | |  | ***Date:*** | | |  |
|  |  | | | |  | |  | | |  |
| ***Category:*** |  |  | | | | | ***Release:*** | | |  |
|  | *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-16 (Release 16) Rel-17 (Release 17) Rel-18 (Release 18) Rel-19 (Release 19)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | The messages related with change of USS has Editor’s Notes indicating that the list of IEs is FFS. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | The IEs for messages related with change of USS are introduced. The procedures are updated, cleanups are performed and an EN is removed. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | The specification of the IEs is missing | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 7.6.2.1, 7.6.2.2, 7.6.2.3, 7.6.3.1, 7.6.3.2, 7.6.3.3, 7.6.3.4, 7.6.3.5, 7.6.3.6, 7.6.3.7, 7.6.3.8 (new) | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **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 \* \* \*

## 7.6 Change of USS during flight

### 7.6.1 General

This feature introduces the UAS application enablement services for supporting change of UAS application specific server. In particular, the UAE layer provides support for the following operations:

- Support of the registration of the UAE clients multi-USS capability to the UAE server as described in clause 7.1a.

- Support the distribution of the for multi-USS policies from the UAS application specific server to the UAE server and the UAE client, as described in clause 7.6.2.1 and clause 7.6.2.2.

- Support the change of UAS application specific server, as described in clause 7.6.2.3.

NOTE: The functions of the USS are out of scope of the present specification.

### 7.6.2 Procedures

#### 7.6.2.1 Management of multi-USS configuration

This procedure manages the multi-USS policies at the UAE server, based on an application request from UAS application specific server to support the change of USS for a UAS.

Figure 7.6.2.1-1 illustrates the procedure where the UAE server receives an application request for managing the multi-USS policies for a UAS from the UAS application specific server.

Pre-condition:

- The UAV has received its UAS ID from the UAS application specific server.

- The UAV has performed the UAS UE registration procedure.



Figure 7.6.2.1-1: Multi-USS management procedure

1. The UAS application specific server sends to the UAE server a Multi-USS management request. The request includes the UAV (UAE client) identifier and the Multi-USS policies. The Multi-USS policy contains: allowed USSes (identified by e.g. FQDN), serving USS information, and additional information for change of USS (USS change constraints parameter geo location/area threshold for change of USS by UAV). The UAE server stores the Multi-USS policies corresponding to the UAV ID. In case of removal of the Multi-USS policy for a USS from the UAE server, the request shall include the UAV identifier and a USS identifier (e.g. FQDN) for the USS that will be removed.

2. The UAE server sends to the UAS application specific server a Multi-USS management response with a positive or negative acknowledgement of the request.

3. UAE server executes the multi-USS configuration according to clause 7.6.2.2.

4. After execution of USS management configuration, the UAE server notifies the UAS application specific server with a Multi-USS management complete based on the configured capabilities of the UAE client.

#### 7.6.2.2 Multi-USS configuration

This procedure enables the configuration of the UAE client, based on a request from UAS application specific server to configure multi-USS policies to the UAE client.

Figure 7.6.2.2-1 illustrates the Multi-USS configuration procedure.

Pre-conditions:

1. The UAS UEs are connected to 5GS and authenticated and authorized by UAS application specific server as specified in clause 5.2 of 3GPP TS 23.256 [4].

2. UAE server has established a UAE session with the respective UAE clients as the UAE clients are successfully registered to the UAE server.

3. UAE server has performed the Multi-USS management procedure according to clause 7.6.2.1.



Figure 7.6.2.2-1: Multi-USS configuration

1. The UAE server sends a Multi-USS configuration request to the UAE client. The UAE client receives a Multi-USS configuration request that includes the Multi-USS policies from the UAE server. In case of removal of the Multi-USS policy for a USS from the UAE client, then the request shall only include a USS identifier (e.g. FQDN) for the USS that will be removed.

2. The UAE client stores or removes the Multi-USS policies as per the information received in step 1.

3. The UAE client sends a Multi-USS configuration response to the UAE server.

#### 7.6.2.3 UAE-layer assisted change of USS

This procedure provides a mechanism for supporting dynamic change of USS which may be performed while the UAV flight is ongoing, due to expected location/mobility of the UAV, emergency events, etc.

Figure 7.6.2.3-1 illustrates the procedure where the UAE server supports the change of USS.

Pre-conditions:

1. UAE client has indicated support of change of USS by the Multi-USS capability.

2. UAS application specific server has provided Multi-USS policies to the UAE client and the UAE server.



Figure 7.6.2.3-1: UAE-layer assisted change of USS

1. The UAE server receives a USS change request from a UAS application specific server. The request includes the UAV (UAE client) identification information, a new serving USS information and USS change authorization information (e.g. authorization token). Optionally, an updated Multi-USS policy for the USS can be included. The UAE server verifies that the request is authorized (e.g., Multi-USS capability is enabled, new USS part of the allowed USS information).

2. The UAE server forwards the USS change request to the UAE client including the new serving USS information and the updated Multi-USS policy.

3. Perform change of USS.

The UAE client initiates the communication with the new serving USS based on the USS change request and the Multi-USS policy.

If an emergency change of USS is deemed necessary by the UAE Client (e.g. sudden loss of contact with the serving USS), the UAE client initiates the change of USS (i.e. on behalf of the USS) based on the previously USS provided Multi-USS policy. In this case, the steps 1-2 are not performed.4a. [Conditional] If the UAE server receives a USS change request from a UAS application specific server, the UAE client sends a USS change response indicating to what USS the change of USS has been performed.

5a. The UAE server sends a USS change response to the UAS application specific server indicating that a change of USS has been performed.

4b. [Conditional] If an emergency change of USS is deemed necessary by the UAE client, the UAE client sends a USS change notification indicating to what USS the change of USS has been performed. The identity of the new UAS application specific server is included.

5b. The UAE server sends a USS change notification to the UAS application specific server indicating that a change of USS has been performed.

NOTE: When steps 4b-5b apply, steps 1-2 are not performed.

### 7.6.3 Information flows

#### 7.6.3.1 Multi-USS management request

Table 7.6.3.1-1 describes the information flow Multi-USS management request from the UAS application specific server to the UAE server.

Table 7.6.3.1-1: Multi-USS management request

|  |  |  |
| --- | --- | --- |
| Information element | Status | Description |
| UASS ID | M | Identity of the UAS application specific server which requests the Multi-USS management. This ID can be the USS identifier, when the UAS application specific server is the USS. |
| UAS ID | M | The identification of the UAS for which the Multi-USS management request applies. This could be in form of identifier for the UAS, e.g group ID; or collection of individual identifiers for the UAV and UAV-C, e.g. CAA level UAV ID, GPSI |
| Multi-USS policy management container (see NOTE 1) | O | The Multi-USS policy management container consists of the requirements and policy for Multi-USS management. |
| > Allowed USS | M | Identification of a USS that can be the target of a switch (identified e.g. by FQDN) |
| > Serving USS information | M | Information about the serving USS |
| > Additional information for change of USS | M | Information about the serving USS, related with the switch to a particular target USS |
| > Area for change of USS | M | The area where the Multi-USS management request applies. This can be geographical area, or topological area in which the capability is active. |
| NOTE 1: If Multi-USS policy management container is not included for a USS, it indicates removal of the Multi-USS policy management related information for this USS.  NOTE 2: A complete list of parameters for the Multi-USS policy is specified by 3GPP TS 24.257 [13]. | | |

#### 7.6.3.2 Multi-USS management response

Table 7.6.3.2-1 describes the information flow Multi-USS management response from the UAE server to the UAS application specific server.

Table 7.6.3.2-1: Multi-USS management response

|  |  |  |
| --- | --- | --- |
| Information element | Status | Description |
| Result | M | The positive or negative result of the Multi-USS management request. |

#### 7.6.3.3 Multi-USS management complete

Table 7.6.3.3-1 describes the information flow Multi-USS management complete from the UAE server to the UAS application specific server.

Table 7.6.3.3-1: Multi-USS management complete

|  |  |  |
| --- | --- | --- |
| Information element | Status | Description |
| Result | M | The positive or negative result of the Multi-USS configuration. |

#### 7.6.3.4 Multi-USS configuration request

Table 7.6.3.4-1 describes the information flow Multi-USS configuration request from the UAE server to the UAE client.

Table 7.6.3.4-1: Multi-USS configuration request

|  |  |  |
| --- | --- | --- |
| Information element | Status | Description |
| UAS ID | M | The identification of the UAS for which the Multi-USS configuration request applies. This could be in form of identifier for the UAS, e.g. group ID; or collection of individual identifiers for the UAV and UAV-C, e.g. CAA level UAV ID, GPSI. |
| Multi-USS policy management configuration (see NOTE 1) | O | The Multi-USS policy management configuration information to be configured at the UAS. |
| > Allowed USS | M | Identification of a USS that can be the target of a switch (identified e.g. by FQDN) |
| > Serving USS information | M | Information about the serving USS |
| > Additional information for change of USS | M | Information about the serving USS, related with the switch to a particular target USS |
| > Area for change of USS | M | The area where the Multi-USS management request applies. This can be geographical area, or topological area in which the capability is active. |
| NOTE 1: If Multi-USS policy management configuration is not included for a USS, it indicates removal of the Multi-USS policy management configuration for this USS.  NOTE 2: A complete list of parameters for the Mulit-USS policy is specified by 3GPP TS 24.257 [13]. | | |

#### 7.6.3.5 Multi-USS configuration response

Table 7.6.3.5-1 describes the information flow Multi-USS configuration response from the UAE client to the UAE server.

Table 7.6.3.5-1: Multi-USS configuration response

|  |  |  |
| --- | --- | --- |
| Information element | Status | Description |
| Result | M | The positive or negative result of the Multi-USS configuration |

#### 7.6.3.6 USS change request

Table 7.6.3.6-1 describes the information flow USS change request from the UAS application specific server to the UAE server and from the UAE server to the UAE client.

Table 7.6.3.6-1: USS change request

|  |  |  |
| --- | --- | --- |
| Information element | Status | Description |
| UASS ID | M | Identity of the UAS application specific server which requests the change of USS. This ID can be the USS identifier, when the UAS application specific server is the USS. |
| UAS ID | M | The identification of the UAS for which the USS change request applies. This could be in form of identifier for the UAS, e.g. group ID; or collection of individual identifiers for the UAV and UAV-C, e.g. CAA level UAV ID, GPSI. |
| Target USS | M | Identification of the USS that is the target of a switch (identified e.g. by FQDN) |
| USS change authorization information | M | An authorization token to verify the request. |
| Multi-USS policy management configuration (see NOTE 1) | O | The Multi-USS policy management configuration information to be configured at the UAS.  It is one set of Multi-USS policy management configuration per USS that can be the target of a switch. |
| > Allowed USS | M | Identification of an allowed USS that can be the target of a switch (identified e.g. by FQDN) |
| > Serving USS information | M | Information about the serving USS |
| > Additional information for change of USS | M | Information about the serving USS, related with the switch to a particular target USS |
| > Area for change of USS | M | The area where the Multi-USS management request applies. This can be geographical area, or topological area in which the capability is active. |
| NOTE 1: If Multi-USS policy management configuration is not included for a USS, it indicates removal of the Multi-USS policy management configuration for this USS.  NOTE 2: A complete list of parameters for the Mulit-USS policy is specified by 3GPP TS 24.257 [13]. | | |

#### 7.6.3.7 USS change response

Table 7.6.3.7-1 describes the information flow USS change response from the UAE client to the UAE server and from the UAE server to the UAS application specific server.

Table 7.6.3.7-1: USS change response

|  |  |  |
| --- | --- | --- |
| Information element | Status | Description |
| Result | M | The positive or negative result of the USS change request. |

#### 7.6.3.8 USS change notification

Table 7.6.3.8-1 describes the information flow USS change notification from the UAE client to the UAE server and from the UAE server to the UAS application specific server.

Table 7.6.3.8-1: USS change notification

|  |  |  |
| --- | --- | --- |
| Information element | Status | Description |
| Reason | M | Client-initiated change due to a required change of USS where guidance from the old USS has not been received. |
| Target USS information | M | Identity of the new UAS application specific server which has taken over as USS. This ID can be the USS identifier. |

## \* \* \* End of Change \* \* \*