**3GPP TSG-SA WG6 Meeting #45 S6-212034**

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

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| *CR-Form-v12.1* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **23.255** | **CR** | **0017** | **rev** | **-** | **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:*** | Resolving the editor's note regarding usage of realtime UAV status | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Huawei, Hisilicon | | | | | | | | | |
| ***Source to TSG:*** | S6 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | UASAPP | | | | |  | ***Date:*** | | | 2021-08-18 |
|  |  | | | |  | |  | | |  |
| ***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:*** | | In clause 7.5.1, the following editors note exists:  Editor's note: How this procedure is used by UAS application specific layer is FFS. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | Adding a procedure to expose the realtime UAV status information to the UAS application specific server. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | The procedure in clause 7.5 will not be used. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 7.5.1, 7.5.2.1, 7.5.2.2 (new), 7.5.2.3 (new), 7.5.2.4 (new), 7.5.3, 7.5.3.1 (new), 7.5.3.2 (new), 7.5.3.3 (new), 7.5.3.4 (new), 7.5.3.5 (new), 7.5.3.6 (new) | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **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 \* \* \* \*

### 7.5.1 General

This clause enables the UAE server to provide a real-time view of UAV network status and location reporting based on current network connection status, in particular with the supporting of following use cases:

- Support of real-time monitor the 3GPP network connection with UAVs.

- Support of reporting of loss of communication with UAVs.

- Support of location reporting such as last known location after loss of communication.

\* \* \* Next Change \* \* \* \*

#### 7.5.2.1 Procedure for real-time UAV network connection status monitoring and location update

Figure 7.5.2.1-1 illustrates the real-time network monitoring and location update support for UAV operations.

Pre-conditions:

- UAE server has subscribed to the monitoring event API for connection monitoring by the NRM server for both UAV and/or UAV client as specified in clause 14.3.x.2.2 of 3GPP TS 23.434 [5].

- UAE server has subscribed for the location information and location deviation monitoring events of UAV from LM server as per the clause 9.3.7 and clause 9.3.x.2 specified in 3GPP TS 23.434 [5].

- Subscription for real-time UAV status information is performed as specified in clause 7.5.2.2.



Figure 7.5.2.1-1: real-time UAV network connection status monitoring and location update

1. The UAE server receives location report and location deviation monitoring event notifications from LM server as specified in clause 9.3.8 and clause 9.3.x.2 of 3GPP TS 23.434 [5]. UAE server shall record the current location reporting timestamp as specified in clause 9.3.2.2 of 3GPP TS 23.434 [5].

2. The UAE server receives monitoring events notification as specified in clause 14.3.x.3.2 of 3GPP TS 23.434 [5]. If events are regarding loss of UE reachability such as when received "Loss\_of\_connectivity\_notification", the UAE server shall record such event with current timestamp.

3. NRM server sends notification when UE re-connected status is detected as specified in clause 14.3.x.3.2 of 3GPP TS 23.434 [5].

4. The UAE server shall record such event with current timestamp, plus with last known location information and timestamp as specified in clause 9.3.2.7 of 3GPP TS 23.434 [5] and trigger location update as specified in clause 9.3.4 of 3GPP TS 23.434 [5].

Editor's note: The exact references to the SEAL procedures used by this procedure is FFS.

\* \* \* Next Change \* \* \* \*

#### 7.5.2.2 Subscription for real-time UAV status information

Figure 7.5.2.2-1 describes the procedure for subscription for real-time UAV status information.

Pre-condition:

- UAS application specific server has been provisioned with UAE server information.



Figure 7.5.2.2-1: Subscription for real-time UAV status information

1. The UAE application specific server sends subscribe real-time UAV status information request to the UAE server. The request includes the UAV ID.

2. The UAE server stores the subscription information.

3. The UAE server sends subscription response to the UAS application specific server.

#### 7.5.2.3 Notification of real-time UAV status information

Pre-conditions:

- UAS application specific server has performed subscription as per procedure in clause 7.5.2.2 with UAE server and the procedure for processing real-time UAV status as specified in clause 7.5.2.1 has performed.



Figure 7.5.2.3-1: Notification for real-time UAV status information

1. When real-time UAV status information is available at the UAE as per the subscription then, the UAE server sends notification of real-time UAV status information to the UAS application specific server.

#### 7.5.2.4 Unsubscription for real-time UAV status information

Figure 7.5.2.4-1 describes the procedure for unsubscription for real-time UAV status information.

Pre-condition:

- UAS application specific server has performed the subscription procedure as specified in clause 7.5.2.2.



Figure 7.5.2.4-1: Unsubscription for real-time UAV status information

1. The UAE application specific server sends unsubscribe real-time UAV status information request to the UAE server. The request includes the subscription ID.

2. The UAE server cancels the subscription information.

3. The UAE server sends unsubscription response to the UAS application specific server.

\* \* \* Next Change \* \* \* \*

### 7.5.3 Information flows

#### 7.5.3.1 Information flows between UAE server and SEAL servers

The usage of information flows between UAE server and SEAL's Location Management Server is specified in clause 7.1.3.2.

The usage of information flows between UAE server and SEAL's Network Resource Management Server is specified in clause 7.1.4.2.

#### 7.5.3.2 Subscribe real-time UAV status information request

Table 7.5.3.2-1 describes the information flow for a UAS application specific server to subscribe to real-time UAV status information at the UAE server.

Table 7.5.3.2-1: Subscribe real-time UAV status information request

|  |  |  |
| --- | --- | --- |
| Information element | Status | Description |
| UAV ID | M | The identifier of the UAV (e.g. 3GPP UE ID or CAA level UAV ID) for which the real-time UAV status is requested. |
| Notification Target URI | M | Target URI where the UAS application specific server wishes to receive the notifications about real-time UAV status information. |

#### 7.5.3.3 Subscribe real-time UAV status information response

Table 7.5.3.3-1 describes the information flow for UAE server to respond for real-time UAV status subscription request from the UAS application specific server.

Table 7.5.3.3-1: Subscribe real-time UAV status information response

|  |  |  |
| --- | --- | --- |
| Information element | Status | Description |
| Result | M | Result from the UAE server in response to subscription request indicating success or failure |
| Subscription ID (NOTE) | O | Identifier of a successful subscription. |
| NOTE: This IE is included when the Result indicates success | | |

#### 7.5.3.4 Notify real-time UAV status information

Table 7.5.3.4-1 describes the information flow for a UAS application specific server to receive notification about real-time UAV status information from the UAE server.

Table 7.5.3.4-1: Notify real-time UAV status information

|  |  |  |
| --- | --- | --- |
| Information element | Status | Description |
| Subscription ID | M | Identifier of the subscription for this notification. |
| Real-time UAV status information | M | The real-time UAV status information |
| >UAV ID | M | The identifier of the UAV (e.g. 3GPP UE ID or CAA level UAV ID) for which the real-time UAV status information is notified. |
| >UAV status information | M | The UAV status information includes the UAV network connection status information, location information and timestamp. |

#### 7.5.3.5 Unsubscribe real-time UAV status information request

Table 7.5.3.5-1 describes the information flow for a UAS application specific server to unsubscribe to real-time UAV status information at the UAE server.

Table 7.5.3.5-1: Unsubscribe real-time UAV status information request

|  |  |  |
| --- | --- | --- |
| Information element | Status | Description |
| Subscription ID | M | Identifier of the subscription for this notification. |

#### 7.5.3.6 Unsubscribe real-time UAV status information response

Table 7.5.3.6-1 describes the information flow for UAE server to respond for real-time UAV status unsubscription request from the UAS application specific server.

Table 7.5.3.6-1: Unsubscribe real-time UAV status information response

|  |  |  |
| --- | --- | --- |
| Information element | Status | Description |
| Result | M | Result from the UAE server in response to unsubscription request indicating success or failure |