**3GPP TSG-CT WG1 Meeting #134C1-22XXXX**

**E-meeting, 17-25 February 2022**

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| *CR-Form-v12.1* |
| **CHANGE REQUEST** |
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|  | **24.501** | **CR** | **4010** | **rev** | **1** | **Current version:** | **17.5.0** |  |
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| *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:***  | Modify service-level-AA parameters |
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| ***Source to WG:*** | Lenovo, Motorola Mobility |
| ***Source to TSG:*** | C1 |
|  |  |
| ***Work item code:*** | ID-UAS |  | ***Date:*** | 2022-02-17 |
|  |  |  |  |  |
| ***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 canbe 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:*** | NAS parameters for the UAS services do not need to be in that granularity as they are defined in spec.Plus some concept of stage 2 are missing. |
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| ***Summary of change:*** | The structure of the NAS parameters have been slightly modified to follow the following figure, where yellow boxes indicate that the NAS parameter is not needed and therefore a description in the informative chapter 4 should be enough. |
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| ***Consequences if not approved:*** | Unnecessary NAS parameters for the UE to recognize. Plus missing some concepts for UAS services, remain. |
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| ***Clauses affected:*** | 4.22.1, 4.22.2, 4.22.3, 4.22.4, 9.11.2.13, 9.11.2.15, 9.11.2.16 |
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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 ...  |
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| ***Other comments:*** |  |
|  |  |
| ***This CR's revision history:*** |  |

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### 4.22.1 General

A 5GS can support UAV identification, authentication, and authorization (see 3GPP TS 23.256 [6AB]). This subclause describes NAS-specific aspects of the 5GS features to support UAV identification, authentication, authorization and C2 communication authorization.

Before accessing 5GS for UAS services, the UE supporting UAS services must have an assigned CAA-level UAV ID. The UE can be registered to 5GS for UAS services if there is a valid aerial subscription in the UE's subscription.

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### 4.22.2 Authentication and authorization of UAV

The 5GS supports the USS UAV Authorization and Authentication (UUAA) procedure for a UE supporting UAS services. Depending on operator policy or regulatory requirements, the UUAA-MM procedure can be performed by the UE and the AMF at a registration procedure as specified in subclause 5.5.1.2 or the UUAA-SM procedure can be performed by the UE and the SMF at a PDU session establishment procedure as specified in subclause 6.4.1.2. The UE shall support UUAA-MM and UUAA-SM, and the network shall support UUAA-SM and may optionally support UUAA-MM. The UUAA procedure needs to be performed by 5GS with USS successfully before the connectivity for UAS services is established.

During the registration procedure as described in subclause 5.5.1.2, the UE supporting UAS services provides CAA-level UAV ID to the AMF, and the AMF may trigger the UUAA-MM procedure. If the UE supporting UAS services does not provide CAA-level UAV ID to the AMF and the network is configured to perform UUAA at registration, the AMF may accept the registration and shall reject PDU session establishment requests for the UAS services. If the UE wants to use the UAS services by providing the CAA Level UAV ID later on, then the UE shall first perform UE-initiated de-registration procedure followed by an initial registration to the 5GS including the CAA-level UAV ID in the registration request.

When a UE supporting UAS services requests to establish a PDU session as described in subclause 6.4.1.2 for USS communication, the UE provides CAA-level UAV ID to the network, and the SMF may trigger the UUAA-SM procedure. If the UE does not provide CAA-level UAV ID and the SM subscription data for the UE requires the UUAA-SM, the network rejects the UE-requested PDU session establishment procedure for the UAS services.

The UE supporting UAS services shall not provide CAA-level UAV ID to the network over non-3gpp access, and the network shall not perform UUAA procedure for non-3gpp access and shall ensure that the UE is not allowed to access any aerial services in non-3GPP access.

If provided by the upper layers, the UE supporting UAS services provides to the network the USS address or USS FQDN during the registration procedure or PDU session establishment procedure so that the network uses the information to discover the USS.

After successful UUAA procedure, either the AMF or the SMF may initiate re-authentication of the UAV when required by the USS. If UUAA-MM fails during a re-authentication and there are PDU sessions established using UAS services, the AMF shall release these PDU sessions and may trigger a network-initiated de-registration procedure based on operator policy. If UUAA-SM fails during a re-authentication, the SMF shall release the PDU session related to re-authentication.

If the UUAA is revoked, the PDU session related to the UAS services shall be released by the SMF. Based on operator policy, the AMF may decide to keep the UE registered or trigger a de-registration procedure.

If the UUAA successful, the UE supporting UAS services, receives the UUAA result and can also receive a CAA-level UAV ID which can be the same as the one used by the UE or a different one. The UE can also receive a UUAA authorization payload which can contain UAS security information and also once again the UUAA result. The UE passes the received information to the upper layers.\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*Next Change\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

### 4.22.3 Authorization of C2 communication

The 5GS supports USS authorization of C2 communication for pairing of UAV and UAV-C. The pairing of UAV and UAV-C needs to be authorized by USS successfully before the user plane connectivity for C2 communication is enabled. The UE supporting UAS services provides CAA-level UAV ID and C2 aviation payload containing C2 authorization information. If provided by the upper layers, the UE supporting UAS services provides C2 aviation payload containing UAV-C pairing information including CAA-level UAV ID and information for UAV-V pairing identification and if authorization of UAV flight is required, the flight authorization information to the network.

Once the authorization of C2 communication is completed, the UE receives from the SMF, the C2 authorization payload containing the C2 authorization result and can also receive UAV-C IP address and C2 session security information. The UE can also receive a CAA-level UAV ID which can be the same as the one used by the UE or a different one. The UE passes the received information to the upper layers.

If a UE supporting UAS services uses a common PDU session for both USS communication and C2 communication, the C2 comunication can be authorized using UUAA-SM procedure during the PDU session establishment procedure or during the PDU session modification procedure. If the pairing of UAV and UAV-C is revoked, the network shall disable C2 communication for the PDU session.

Editor's note [ID\_UAS, CR3135]: It is FFS whether disabling C2 communication leads other actions than releasing of the PDU session.

If a UE supporting UAS services uses separate PDU sessions for, respectively, USS communication and C2 communication, the C2 communication is authorized using UUAA-SM during the PDU session establishment procedure. If the pairing of UAV and UAV-C is revoked, the PDU session for C2 communication shall be released by the SMF.

Editor's note [ID\_UAS, CR3135]: Details of the authorization of C2 communication procedure will be specified once stage-2 normative text is available.

Editor's note [ID\_UAS, CR3135]: Details of UAV-C pairing change will be specified according to stage-2 normative text

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### 4.22.4 Authorization of UAV flight

The 5GS supports USS authorization of UAV flight. The authorization of UAV flight for the UE supporting UAS services can be performed using UUAA-SM procedure during the PDU session establishment procedure or during PDU session modification procedure. The UE supporting UAS services provides CAA-level UAV ID and if provided by upper layers, C2 aviation payload containing the flight authorization information to the network.

Editor's note [ID\_UAS, CR3135]: Details of the UAV flight authorization procedure will be specified once stage-2 normative text is available.

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#### 9.11.2.13 Service-level-AA payload

The purpose of the Service-level-AA payload information element is to carry the upper layer payload for authentication and authorization between the UE and the service-level-AA server.

The Service-level-AA payload information element is coded as shown in figure 9.11.2.13.1 and table 9.11.2.13.1.

The Service-level-AA payload information element is a type 6 information element with minimum length of 4 octets and maximum length of 65535 octets.

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| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| Service-level-AA payload IEI | octet 1 |
| Service-level-AA payload length | octet 2octet 3 |
| Service-level-AA payload | octets 4-s |

Figure 9.11.2.13.1: Service-level-AA payload information element

Table 9.11.2.13.1: Service-level-AA payload information element

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| Service-level-AA payload (octet 4 to octet s)A payload for authentication and authorization transparently transported and which is provided from/to the upper layers. |

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#### 9.11.2.15 Service-level-AA payload type

The purpose of the Service-level-AA payload type information element is to indicates type of payload included in the Service-level-AA payload information element.

The Service-level-AA payload type information element is coded as shown in figure 9.11.2.15.1 and table 9.11.2.15.1.

The Service-level-AA payload type information element is a type 4 information element with minimum length of 3 octets.

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| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| Service-level-AA payload type IEI | octet 1 |
| Service-level-AA payload type length | octet 2 |
| Service-level-AA payload type | octet 3 |

Figure 9.11.2.15.1: Service-level-AA payload type information element

Table 9.11.2.15.1: Service-level-AA payload type information element

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| Service-level-AA payload type (octet 3):Bits |
| **8** | **7** | **6** | **5** | **4** | **3** | **2** | **1** |  |  |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |  | UUAA payload |
| 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |  | C2 communication payload |
| All other values are reserved. |
|  |
| If the service-level-AA payload type indicates UUAA payload, the field for the service-level-AA payload of the Service-level AA payload information element is either UUAA aviation payload if transmitted by the UE to the network or UUAA authorization payload if transmitted by the network to the UE. |
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| If the service-level-AA payload type indicates C2 payload, the field for the service-level-AA payload of the Service-level AA payload information element is either C2 aviation payload if transmitted by the UE to the network or C2 authorization payload if transmitted by the network to the UE. |
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#### 9.11.2.16 Void

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