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# Foreword

This Technical Specification has been produced by the 3rd Generation Partnership Project (3GPP).

The contents of the present document are subject to continuing work within the TSG and may change following formal TSG approval. Should the TSG modify the contents of the present document, it will be re-released by the TSG with an identifying change of release date and an increase in version number as follows:

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y the second digit is incremented for all changes of substance, i.e. technical enhancements, corrections, updates, etc.

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In the present document, modal verbs have the following meanings:

**shall** indicates a mandatory requirement to do something

**shall not** indicates an interdiction (prohibition) to do something

The constructions "shall" and "shall not" are confined to the context of normative provisions, and do not appear in Technical Reports.

The constructions "must" and "must not" are not used as substitutes for "shall" and "shall not". Their use is avoided insofar as possible, and they are not used in a normative context except in a direct citation from an external, referenced, non-3GPP document, or so as to maintain continuity of style when extending or modifying the provisions of such a referenced document.

**should** indicates a recommendation to do something

**should not** indicates a recommendation not to do something

**may** indicates permission to do something

**need not** indicates permission not to do something

The construction "may not" is ambiguous and is not used in normative elements. The unambiguous constructions "might not" or "shall not" are used instead, depending upon the meaning intended.

**can** indicates that something is possible

**cannot** indicates that something is impossible

The constructions "can" and "cannot" are not substitutes for "may" and "need not".

**will** indicates that something is certain or expected to happen as a result of action taken by an agency the behaviour of which is outside the scope of the present document

**will not** indicates that something is certain or expected not to happen as a result of action taken by an agency the behaviour of which is outside the scope of the present document

**might** indicates a likelihood that something will happen as a result of action taken by some agency the behaviour of which is outside the scope of the present document

**might not** indicates a likelihood that something will not happen as a result of action taken by some agency the behaviour of which is outside the scope of the present document

In addition:

**is** (or any other verb in the indicative mood) indicates a statement of fact

**is not** (or any other negative verb in the indicative mood) indicates a statement of fact

The constructions "is" and "is not" do not indicate requirements.

# 1 Scope

The present document specifies the stage 3 Protocol and data model for the UAS Application Enabler (UAE) Server services, for enabling the support of Uncrewed Aerial System (UAS) applications over 3GPP networks. It provides stage 3 protocol definitions and message flows, and specifies the API for each service offered by the UAE Server.

The stage 2 application layer architecture for Uncrewed Aerial System (UAS), functional requirements, procedures and information flows necessary for enabling Uncrewed Aerial System (UAS) applications over 3GPP networks are specified in 3GPP TS 23.255 [6].

The common protocol and interface aspects for API definition are specified in clause 5.2 of 3GPP TS 29.122 [2].

# 2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non‑specific.

- For a specific reference, subsequent revisions do not apply.

- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that documentin the same Release as the present document.

[1] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications".

[2] 3GPP TS 29.122: "T8 reference point for Northbound Application Programming Interfaces (APIs)".

[3] 3GPP TS 29.501: "5G System; Principles and Guidelines for Services Definition; Stage 3".

[4] OpenAPI: "OpenAPI Specification Version 3.0.0", <https://spec.openapis.org/oas/v3.0.0>.

[5] 3GPP TR 21.900: "Technical Specification Group working methods".

[6] 3GPP TS 23.255: "Application layer support for Uncrewed Aerial System (UAS); Functional architecture and information flows".

[7] 3GPP TS 29.571: "5G System; Common Data Types for Service Based Interfaces; Stage 3".

[8] 3GPP TS 29.572: "5G System; Location Management Services; Stage 3".

[9] 3GPP TS 23.222: "Common API Framework for 3GPP Northbound APIs; Stage 2".

[10] 3GPP TS 29.222: "Common API Framework for 3GPP Northbound APIs; Stage 3".

[11] 3GPP TS 33.122: "Security aspects of Common API Framework (CAPIF) for 3GPP northbound APIs".

[12] IETF RFC 6749: "The OAuth 2.0 Authorization Framework".

# 3 Definitions, symbols and abbreviations

## 3.1 Definitions

For the purposes of the present document, the terms and definitions given in 3GPP TR 21.905 [1] and the following apply. A term defined in the present document takes precedence over the definition of the same term, if any, in 3GPP TR 21.905 [1].

For the purpose of the present document, the terms and definitions given in clause 3 of 3GPP TS 23.255 [6] also apply, including the ones referencing other specifications.

## 3.2 Symbols

Void.

## 3.3 Abbreviations

For the purposes of the present document, the abbreviations given in 3GPP TR 21.905 [1] and the following apply. An abbreviation defined in the present document takes precedence over the definition of the same abbreviation, if any, in 3GPP TR 21.905 [1].

BVLOS Beyond Visual Line Of Sight

C2 Command and Control

CAA Civil Aviation Authorities

DAA Detect And Avoid

RSRP Reference Signal Received Power

UAE UAS Application Enabler

UAS Uncrewed Arial System

UASS UAS Application Specific Server

UAV Uncrewed Aerial Vehicle

UAV-C Uncrewed Aerial Vehicle – Controller

USS UAS Service Supplier

UTM UAS Traffic Management

# 4 Overview

The UAS Application Enabler (UAE) Server forms part of the UAS application enabler layer that aims to ensure the efficient use and deployment of UAS over 3GPP systems. The UAE Server supports for this purpose, among other functionalities defined in 3GPP TS 23.255 [6], the following functionalities:

- UAS application layer support functions to a UASS (e.g. USS/UTM) over the Us reference point, i.e.:

- C2 operation mode configuration management for a UAS (i.e. pair of UAV and UAV-C);

- C2 communication modes switching control and management for a UAS (i.e. pair of UAV and UAV-C);

- Real-Time UAV Connection Status Monitoring and Location reporting;

- USS change management; and

- DAA management;

and

- interaction with other UAE Servers over the UAE-E reference point, in order to support distributed UAE Server deployments.

Figure 4-1 shows the reference model of the UAS Application Layer, with a focus on the UAE Server:



Figure 4-1: UAS Application Layer functional model

# 5 Services offered by the UAE Server

## 5.1 Introduction

The UAE Server provides the following services:

- UAE\_C2OperationModeManagement

- UAE\_RealtimeUAVStatus

- UAE\_ChangeUSSManagement

- UAE\_DAASupport

Table 5.1-1 summarizes the corresponding APIs defined in this specification.

Table 5.1-1: API Descriptions

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Service Name | Clause | Description | OpenAPI Specification File | API Name | Annex |
| UAE\_C2OperationModeManagement | 5.2 | UAE Server C2 Operation Mode Management Service | TS29257\_UAE\_C2OperationModeManagement.yaml | uae-c2opmode-mngt | A.2 |
| UAE\_RealtimeUAVStatus | 5.3 | UAE Server Real-time UAV Status Service | TS29257\_UAE\_RealtimeUAVStatus.yaml | uae-uav-status | A.3 |
| UAE\_ChangeUSSManagement | 5.4 | UAE USS Change Management Service | TS29257\_UAE\_ChangeUSSManagement.yaml | uae-usschange-mngt | A.4 |
| UAE\_DAASupport | 5.5 | UAE DAA Support | TS29257\_UAE\_DAASupport.yaml | uae-daa | A.5 |

NOTE: When 3GPP TS 29.122 [2] is referenced for the common protocol and interface aspects for API definition in the clauses under clause 5, the UAE Server takes the role of the SCEF and the UASS takes the role of the SCS/AS.

## 5.2 UAE\_C2OperationModeManagement Service

### 5.2.1 Service Description

The UAE\_C2OperationModeManagement service exposed by the UAE Server enables a UASS (e.g. USS/UTM) to:

- communicate C2 operation mode configuration information to the UAE Server for a UAS (i.e. pair of UAV and UAV-C);

- receive notifications from the UAE Server on the C2 operation mode management completion;

- receive notifications from the UAE Server on the C2 communication mode selected by a UAS (i.e. pair of UAV and UAV-C); and

- receive notifications from the UAE Server when C2 communication mode switching is carried out and decide whether to authorize it or not.

### 5.2.2 Service Operations

#### 5.2.2.1 Introduction

The service operations defined for the UAE\_C2OperationModeManagement service are shown in table 5.2.2.1-1.

Table 5.2.2.1-1: UAE\_C2OperationModeManagement Service Operations

|  |  |  |
| --- | --- | --- |
| Service Operation Name | Description | Initiated by |
| UAE\_C2OperationModeManagement\_Initiate | This service operation enables a UASS to initiate the configuration of C2 operation modes for a UAS (i.e. pair of UAV and UAV-C) by communicating the associated C2 operation mode configuration information to the UAE Server. | e.g. UASS |
| UAE\_C2OperationModeManagement\_Notify | This service operation enables a UAE Server to notify a previously subscribed UASS either:  - on C2 operation mode management completion;  - on the C2 communication mode selected by a UAS (i.e. pair of UAV and UAV-C); or  - when C2 communication mode switching is carried out. The UASS may then confirm the targeted C2 communication mode switching or not. | UAE Server |

#### 5.2.2.2 UAE\_C2OperationModeManagement\_Initiate

##### 5.2.2.2.1 General

This service operation is used by a UASS to request the provisioning of C2 operation mode configuration information for a UAS (i.e. pair of UAV and UAV-C) to the UAE Server.

The following procedures are supported by the "UAE\_C2OperationModeManagement\_Initiate" service operation:

- C2 Operation Mode Initiation procedure.

##### 5.2.2.2.2 C2 Operation Mode Initiation

Figure 5.2.2.2.2-1 depicts a scenario where a UASS sends a request to the UAE Server to request the provisioning of C2 operation mode configuration information for a UAS (i.e. pair of UAV and UAV-C) (see also clause 7.4 of 3GPP°TS°23.255°[6]).



Figure 5.2.2.2.2-1: C2 Operation Mode Initiation procedure

1. The UASS shall send for this purpose an HTTP POST request (custom operation: "Initiate") to the UAE Server, with the request URI set to "{apiRoot}/uae-c2opmode-mngt/<apiVersion>/initiate" and the request body including the ConfigureData data structure that shall contain:

- the identifier of the UASS that is sending the request, within the "uassId" attribute;

- the identifier of the target UAS (i.e. pair of UAV and UAV-C) to which the C2 Operation Mode configuration information is destined, within the "uasId" attribute;

- the allowed C2 communication modes for the UAS (i.e. pair of UAV and UAV-C) identified by the "uasId" attribute, within the "allowedC2CommModes" attribute;

- the C2 Operation Mode switching types to be supported by the UAE Server, within the "c2CommModeSwitchTypes" attribute;

- the notification URI via which the UASS desires to receive notifications from the UAE Server, within the "notificationUri" attribute;

- the primary C2 communication mode (i.e. either Direct C2 Communication mode or Network-Assisted C2 Communication mode) to be used by the UAS (i.e. pair of UAV and UAV-C) identified by the "uasId" attribute, within the "primaryC2CommMode" attribute; and

- the C2 operation mode switching policies, within the "c2SwitchPolicies" attribute;

and may also contain:

- the secondary C2 communication mode (i.e. either Direct C2 Communication mode or Network-Assisted C2 Communication mode) to be used by the UAS (i.e. pair of UAV and UAV-C) identified by the "uasId" attribute, within the "secondaryC2CommMode" attribute;

- the service area within which the C2 operation mode management request applies (i.e. a geographical area or a topological area), within the "c2ServiceArea" attribute; and

- the list of features supported by the UASS among the ones defined in clause 6.1.8, within the "suppFeat" attribute.

2a. Upon success, the UAE Server shall respond with an HTTP "200 OK" status code with the response body including the C2Result data structure which shall contain a feedback from the UAE Server on whether the request for C2 Operation Mode configuration information provisioning is confirmed (i.e. can be undertaken by the UAE Server) or not. The C2Result data structure may also contain the list of negotiated supported features.

2b. On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the HTTP POST response body.

#### 5.2.2.3 UAE\_C2OperationModeManagement\_Notify

##### 5.2.2.3.1 General

This service operation is used by a UAE Server to notify a previously subscribed UASS either on C2 operation mode management completion, on the C2 communication mode selected by a UAS (i.e. pair of UAV and UAV-C) or when C2 communication mode switching is carried out. For the latter, the UASS may then confirm the targeted C2 communication mode switching or not. See also clause 7.4 of 3GPP°TS°23.255 [6].

The following procedures are supported by the "UAE\_C2OperationModeManagement\_Notify" service operation:

- C2 Operation Mode Management Completion Notification.

- Selected C2 Communication Mode Notification.

- C2 Communication Mode Switching Notification.

##### 5.2.2.3.2 C2 Operation Mode Management Completion Notification

Figure 5.2.2.3.2-1 depicts a scenario where the UAE Server sends a request to notify a previously subscribed UASS on the C2 operation mode management completion status for a UAS (i.e. pair of UAV and UAV-C). See also clause 7.4 of 3GPP°TS°23.255°[6].



Figure 5.2.2.3.2-1: C2 Operation Mode Management Completion Notification procedure

1. The UAE Server shall send for this purpose an HTTP POST request to the UASS with the request URI set to "{notificationUri}/c2mode-mngt-completion", where the "notificationUri" is set to the value received from the UASS during the C2 Operation Mode Initiation procedure defined in clause 5.2.2.2, and the request body including the C2OpModeMngtCompStatus data structure that shall contain:

- the identifier of the UAS (i.e. pair of UAV and UAV-C) to which the notification is related, within the "uasId" attribute; and

- the C2 operation mode management completion status (i.e. either successful or not successful) for the concerned UAS (i.e. pair of UAV and UAV-C), within the "status" attribute.

2a. Upon success, the UASS shall respond to the UAE Server with an HTTP "204 No Content" status code to acknowledge the reception of the notification.

If the UASS is not able to handle the notification request, it may respond with an HTTP "307 Temporary Redirect" status code or an HTTP "308 Permanent Redirect" status code including an HTTP "Location" header containing an alternative URI representing the end point of an alternative UASS where the notification should be sent, as defined in clause 5.2.10 of 3GPP TS 29.122 [2].

2b. On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the HTTP POST response body.

##### 5.2.2.3.3 Selected C2 Communication Mode Notification

Figure 5.2.2.3.3-1 depicts a scenario where the UAE Server sends a request to notify a previously subscribed UASS on the C2 communication mode selected by a UAS (i.e. pair of UAV and UAV-C). See also clause 7.4 of 3GPP°TS°23.255°[6].



Figure 5.2.2.3.3-1: Selected C2 Communication Mode Notification procedure

1. The UAE Server shall send for this purpose an HTTP POST request to the UASS with the request URI set to "{notificationUri}/inform-selec-c2mode", where the "notificationUri" is set to the value received from the UASS during the C2 Operation Mode Initiation procedure defined in clause 5.2.2.2, and the request body including the SelectedC2CommModeNotif data structure that shall contain:

- the identifier of the UAS (i.e. pair of UAV and UAV-C) to which the notification is related, within the "uasId" attribute; and

- the primary C2 communication mode selected by the UAS (i.e. pair of UAV and UAV-C) identified by the "uasId" attribute, within the "selPrimaryC2CommMode" attribute;

and may also contain:

- the secondary C2 communication mode selected by the UAS (i.e. pair of UAV and UAV-C) identified by the "uasId" attribute, within the "selSecondaryC2CommMode" attribute.

2a. Upon success, the UASS shall respond to the UAE Server with an HTTP "204 No Content" status code to acknowledge the reception of the notification.

If the UASS is not able to handle the notification request, it may respond with an HTTP "307 Temporary Redirect" status code or an HTTP "308 Permanent Redirect" status code including an HTTP "Location" header containing an alternative URI representing the end point of an alternative UASS where the notification should be sent, as defined in clause 5.2.10 of 3GPP TS 29.122 [2].

2b. On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the HTTP POST response body.

##### 5.2.2.3.4 C2 Communication Mode Switching Notification

Figure 5.2.2.3.4-1 depicts a scenario where the UAE Server sends a request to notify a previously subscribed UASS on the targeted C2 communication mode switching for a UAS (i.e. pair of UAV and UAV-C) and may request confirmation from the UASS. See also clause 7.4 of 3GPP°TS°23.255°[6].



Figure 5.2.2.3.4-1: C2 Communication Mode Switching Notification procedure

1. The UAE Server shall send for this purpose an HTTP POST request to the UASS with the request URI set to "{notificationUri}/inform-c2mode-switch", where the "notificationUri" is set to the value received from the UASS during the C2 Operation Mode Initiation procedure defined in clause 5.2.2.2, and the request body including the C2CommModeSwitchNotif data structure that shall contain:

- the identifier of the UAE Server that is sending the notification and possibly requesting C2 Communication Mode switching confirmation for a UAS (i.e. pair of UAV and UAV-C) from the UASS, within the "uaeServerId" attribute;

- the identifier of the UAS (i.e. pair of UAV and UAV-C) to which the provided C2 Communication Mode switching information is related, within the "uasId" attribute; and

- the targeted C2 Communication Mode switching for the UAS (i.e. pair of UAV and UAV-C) identified by the "uasId" attribute, within the "c2CommModeSwitchType" attribute;

And may contain:

- the C2 Communication Mode switching cause, within the "switchingCause" attribute.

2a. Upon success, if the UASS has to confirm (i.e. approve) the C2 Communication Mode switching operation to the UAE Server, the UASS shall respond with an HTTP "200 OK" status code with the response body including the C2Result data structure which shall contain a feedback from the UASS on whether this C2 Communication Mode switching is confirmed (i.e. approved) or not.

2b. Otherwise, upon success, if the UASS does not have to confirm (i.e. approve) the C2 Communication Mode switching operation to the UAE Server, the UASS shall respond to the UAE Server with an HTTP "204 No Content" status code to acknowledge the reception of the notification.

If the UASS is not able to handle the notification request, it may respond with an HTTP "307 Temporary Redirect" status code or an HTTP "308 Permanent Redirect" status code including an HTTP "Location" header containing an alternative URI representing the end point of an alternative UASS where the notification should be sent, as defined in clause 5.2.10 of 3GPP TS 29.122 [2].

2c. On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the HTTP POST response body.

## 5.3 UAE\_RealtimeUAVStatus Service

### 5.3.1 Service Description

The UAE\_RealtimeUAVStatus service exposed by the UAE Server enables a UASS (e.g. USS/UTM) to:

- subscribe to real-time UAV status information reporting;

- update an existing real-time UAV status information reporting subscription;

- receive real-time UAV status notifications; and

- unsubscribe from real-time UAV status information reporting.

The UAV status information includes the UAV network connection status information and the UAV location information.

### 5.3.2 Service Operations

#### 5.3.2.1 Introduction

The service operations defined for the UAE\_RealtimeUAVStatus service are shown in table 5.3.2.1-1.

Table 5.3.2.1-1: UAE\_RealtimeUAVStatus Service Operations

|  |  |  |
| --- | --- | --- |
| Service Operation Name | Description | Initiated by |
| UAE\_RealtimeUAVStatus\_Subscribe | This service operation enables a UASS to subscribe to real-time UAV status information reporting or update an existing real-time UAV status information reporting subscription. | e.g. UASS |
| UAE\_RealtimeUAVStatus\_Unsubscribe | This service operation enables a UASS to unsubscribe from real-time UAV status information reporting. | e.g. UASS |
| UAE\_RealtimeUAVStatus\_Notify | This service operation enables a UAE Server to notify a previously subscribed UASS on real-time UAV status information. | UAE Server |

#### 5.3.2.2 UAE\_RealtimeUAVStatus\_Subscribe

##### 5.3.2.2.1 General

This service operation is used by a UASS to subscribe to real-time UAV status information reporting or update an existing real-time UAV status information reporting subscription.

The following procedures are supported by the "UAE\_RealtimeUAVStatus\_Subscribe" service operation:

- Subscribe to real-time UAV status information reporting.

- Update an existing real-time UAV status information reporting subscription.

##### 5.3.2.2.2 Subscribe to real-time UAV status information reporting

Figure 5.3.2.2.2-1 depicts a scenario where a UASS sends a request to the UAE Server to request the creation of a subscription to real-time UAV status information reporting (see also clause 7.5 of 3GPP°TS°23.255°[6]).



Figure 5.3.2.2.2-1: Procedure for subscribing to real-time UAV status information reporting

1. In order to subscribe to real-time UAV status reporting, the UASS shall send an HTTP POST request to the UAE Server, with the request URI set to "{apiRoot}/uae-uav-status/<apiVersion>/subscriptions" and the request body including the RTUavStatusSubsc data structure that shall contain:

- the identifier of the UASS that is sending the request, within the "uassId" attribute;

- the identifier(s) of the target UAV(s) to which the subscription is related, within the "uavIds" attribute;

- the notification URI via which the UASS desires to receive real-time UAV status notifications from the UAE Server, within the "notificationUri" attribute; and

- the list of features supported by the UASS among the ones defined in clause 6.2.8, within the "suppFeat" attribute.

2a. Upon success, the UAE Server shall respond with an HTTP "201 Created" status code with the response body containing a representation of the created Individual Real-time UAV Status Subscription resource within the RTUavStatusSubsc data structure.

2b. On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the HTTP POST response body.

##### 5.3.2.2.3 Update an existing real-time UAV status information reporting subscription

Figure 5.3.2.2.3-1 depicts a scenario where a UASS sends a request to the UAE Server to request the update of an existing subscription to real-time UAV status information reporting.



Figure 5.3.2.2.3-1: Procedure for updating a real-time UAV status information reporting subscription

1. In order to update an existing real-time UAV status reporting subscription, the UASS shall send an HTTP PUT request to the UAE Server, with the request URI set to "{apiRoot}/uae-uav-status/<apiVersion>/subscriptions/{subscriptionId}", requesting to update the Individual Real-time UAV Status Subscription resource identified by the provided "subscriptionId" path segment. The request body shall include an updated representation of the resource within the RTUavStatusSubsc data structure that shall contain:

- the identifier of the UASS that is sending the request, within the "uassId" attribute;

NOTE: An alternative UASS than the one that requested the creation of the subscription resource can send this subscription update request.

- the same or an updated list of identifier(s) of the target UAV(s) to which the subscription is related, within the "uavIds" attribute; and

- the same or an updated notification URI via which the UASS desires to receive real-time UAV status notifications from the UAE Server, within the "notificationUri" attribute.

2a. Upon success, the UAE Server shall update the concerned Individual Real-time UAV Status Subscription resource accordingly and respond with either:

- an HTTP "200 OK" status code with the response body containing a representation of the updated Individual Real-time UAV Status Subscription resource within the RTUavStatusSubsc data structure; or

- an HTTP "204 No Content" status code.

If the UAE Server is not able to handle the request, it may respond with an HTTP "307 Temporary Redirect" status code or an HTTP "308 Permanent Redirect" status code including an HTTP "Location" header containing an alternative URI of the resource located in an alternative UAE Server, as defined in clause 5.2.10 of 3GPP TS 29.122 [2].

2b. On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the HTTP PUT response body.

#### 5.3.2.3 UAE\_RealtimeUAVStatus\_Unsubscribe

##### 5.3.2.3.1 General

This service operation is used by a UASS to unsubscribe from real-time UAV status information reporting.

The following procedures are supported by the "UAE\_RealtimeUAVStatus\_Unsubscribe" service operation:

- Unsubscribe from real-time UAV status information reporting.

##### 5.3.2.3.2 Unsubscribe from real-time UAV status information reporting

Figure 5.3.2.3.2-1 depicts a scenario where a UASS sends a request to the UAE Server to request the deletion of an existing Individual Real-time UAV Status Subscription resource (see also clause 7.5 of 3GPP°TS°23.255°[6]).



Figure 5.3.2.3.2-1: Procedure for unsubscribing from real-time UAV status information reporting

1. In order to unsubscribe from real-time UAV status reporting, the UASS shall send an HTTP DELETE request to the UAE Server, with the request URI set to "{apiRoot}/uae-uav-status/<apiVersion>/subscriptions/{subscriptionId}", requesting to delete the Individual Real-time UAV Status Subscription resource identified by the provided "subscriptionId" path segment.

2a. Upon success, the UAE Server shall respond with an HTTP "204 No Content" status code.

If the UAE Server is not able to handle the request, it may respond with an HTTP "307 Temporary Redirect" status code or an HTTP "308 Permanent Redirect" status code including an HTTP "Location" header containing an alternative URI of the resource located in an alternative UAE Server, as defined in clause 5.2.10 of 3GPP TS 29.122 [2].

2b. On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the HTTP DELETE response body.

#### 5.3.2.4 UAE\_RealtimeUAVStatus\_Notify

##### 5.3.2.4.1 General

This service operation is used by a UAE Server to notify a previously subscribed UASS on real-time UAV status information. See also clause 7.5 of 3GPP°TS°23.255 [6].

The following procedures are supported by the "UAE\_RealtimeUAVStatus\_Notify" service operation:

- Real-time UAV Status Notification.

##### 5.3.2.4.2 Real-time UAV Status Notification

Figure 5.3.2.4.2-1 depicts a scenario where the UAE Server sends a request to notify a previously subscribed UASS on real-time UAV status information. See also clause 7.5 of 3GPP°TS°23.255°[6].



Figure 5.3.2.4.2-1: Real-time UAV Status Notification procedure

1. The UAE Server shall send for this purpose an HTTP POST request to the UASS with the request URI set to "{notificationUri}/uav-status", where the "notificationUri" is set to the value received from the UASS during the real-time UAV status reporting subscription creation/update procedures defined in clause 5.3.2.2, and the request body including the RTUavStatusNotif data structure that shall contain:

- The identifier of the Individual Real-time UAV Status Subscription to which the notification is related, within the "subscriptionId" attribute; and

- The real-time UAV status information for the concerned UAV(s), within the "rTUavStatus" attribute.

2a. Upon success, the UASS shall respond with an HTTP "204 No Content" status code to acknowledge the reception of the notification to the UAE Server.

If the UASS is not able to handle the notification request, it may respond with an HTTP "307 Temporary Redirect" status code or an HTTP "308 Permanent Redirect" status code including an HTTP "Location" header containing an alternative URI representing the end point of an alternative UASS where the notification should be sent, as defined in clause 5.2.10 of 3GPP TS 29.122 [2].

2b. On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the HTTP POST response body.

## 5.4 UAE\_ChangeUSSManagement Service

### 5.4.1 Service Description

The UAE\_ChangeUSSManagement service exposed by the UAE Server enables a UASS (e.g. USS) to:

- create/update/delete USS Change Policies;

- request USS change;

- receive notifications on USS Change Policy Configuration status;

- receive notifications on USS Change (i.e. that a USS change was performed); and

- receive notifications when USS change needs to be triggered.

### 5.4.2 Service Operations

#### 5.4.2.1 Introduction

The service operations defined for the UAE\_ChangeUSSManagement service are shown in table 5.4.2.1-1.

Table 5.4.2.1-1: UAE\_ChangeUSSManagement Service Operations

|  |  |  |
| --- | --- | --- |
| Service Operation Name | Description | Initiated by |
| UAE\_ChangeUSSManagement\_ManageUSS | This service operation enables a UASS to create/update/delete a USS Change Policy. | e.g. UASS |
| UAE\_ChangeUSSManagement\_RequestUSSChange | This service operation enables a UASS to trigger USS change. | e.g. UASS |
| UAE\_ChangeUSSManagement\_Notify | This service operation enables a UAE Server to notify a previously subscribed UASS either:  - on USS Change Policy Configuration completion status;  - on USS change (i.e. that a USS change was performed); or  - when USS change needs to be triggered. | e.g. UASS |

#### 5.4.2.2 UAE\_ChangeUSSManagement\_ManageUSS

##### 5.4.2.2.1 General

This service operation is used by a UASS to request the creation/update/deletion of a USS Change Policy at the UAE Server.

The following procedures are supported by the "UAE\_ChangeUSSManagement\_ManageUSS" service operation:

- USS Change Policy Creation.

- USS Change Policy Update.

- USS Change Policy Deletion.

##### 5.4.2.2.2 USS Change Policy Creation

Figure 5.4.2.2.2-1 depicts a scenario where a UASS sends a request to the UAE Server to create a USS Change Policy (see also clause 7.6 of 3GPP°TS°23.255°[6]).



Figure 5.4.2.2.2-1: Procedure for USS Change Policy Creation

1. In order to request the creation of a USS Change Policy, the UASS shall send an HTTP POST request to the UAE Server targeting the "USS Change Policies" resource, with the request body including the USSChangePolReq data structure.

2a. Upon success, the UAE Server shall respond with an HTTP "201 Created" status code with the response body containing a representation of the created "Individual USS Change Policy" resource and potentially additional information within the USSChangePolResp data structure.

2b. On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the HTTP POST response body, as specified in clause 6.3.7.

##### 5.4.2.2.3 USS Change Policy Update

Figure 5.4.2.2.2-1 depicts a scenario where a UASS sends a request to the UAE Server to update an existing USS Change Policy (see also clause 7.6 of 3GPP°TS°23.255°[6]).



Figure 5.4.2.2.3-1: Procedure for USS Change Policy Update

1. In order to request the update/modification of an existing USS Change Policy, the UASS shall send an HTTP PUT/PATCH request to the UAE Server targeting the corresponding "Individual USS Change Policy" resource, with the request body including the USSChangePolicy data structure (in case the HTTP PUT method is used) or the USSChangePolicyPatch data structure (in case the HTTP PATCH method is used).

NOTE: An alternative UASS (i.e. other than the one that requested the creation of the targeted resource) can initiate this request.

If the UAE Server is not able to handle the request, it may respond with an HTTP "307 Temporary Redirect" status code or an HTTP "308 Permanent Redirect" status code including an HTTP "Location" header containing an alternative URI of the resource located in an alternative UAE Server, as defined in clause 5.2.10 of 3GPP TS 29.122 [2].

2a. Upon success, the UAE Server shall respond with either:

- an HTTP "200 OK" status code with the response body containing a representation of the updated/modified "Individual USS Change Policy" resource and potentially additional information within the USSChangePolicy data structure; or

- an HTTP "204 No Content" status code.

2b. On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the HTTP PUT/PATCH response body, as specified in clause 6.3.7.

##### 5.4.2.2.3 USS Change Policy Deletion

Figure 5.4.2.2.2-1 depicts a scenario where a UASS sends a request to the UAE Server to delete an existing USS Change Policy (see also clause 7.6 of 3GPP°TS°23.255°[6]).



Figure 5.4.2.2.3-1: Procedure for USS Change Policy Deletion

1. In order to request the deletion of an existing USS Change Policy, the UASS shall send an HTTP DELETE request to the UAE Server targeting the corresponding "Individual USS Change Policy" resource.

NOTE: An alternative UASS (i.e. other than the one that requested the creation of the targeted resource) can initiate this request.

2a. Upon success, the UAE Server shall respond with an HTTP "204 No Content" status code.

2b. On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the HTTP DELETE response body, as specified in clause 6.3.7.

#### 5.4.2.3 UAE\_ChangeUSSManagement\_RequestUSSChange

##### 5.4.2.3.1 General

This service operation is used by a UASS to request USS change.

The following procedures are supported by the "UAE\_ChangeUSSManagement\_RequestUSSChange" service operation:

- USS Change Request.

##### 5.4.2.3.2 USS Change Request

Figure 5.4.2.3.2-1 depicts a scenario where a UASS sends a request to the UAE Server to request USS change (see also clause 7.6 of 3GPP°TS°23.255°[6]).



Figure 5.4.2.3.2-1: Procedure for USS Change Request

1. In order to request USS change, the UASS shall send an HTTP POST request (custom operation: "RequestUssChange") to the UAE Server, with the request URI set to "{apiRoot}/uae-usschange-mngt/<apiVersion>/request-usschange", and the request body including the USSChangeReq data structure.

If the UAE Server is not able to handle the request, it may respond with an HTTP "307 Temporary Redirect" status code or an HTTP "308 Permanent Redirect" status code including an HTTP "Location" header containing an alternative URI of the resource located in an alternative UAE Server, as defined in clause 5.2.10 of 3GPP TS 29.122 [2].

2a. Upon success, the UAE Server shall respond with an HTTP "204 No Content" status code.

2b. On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the HTTP POST response body, as specified in clause 6.3.7.

#### 5.4.2.4 UAE\_ChangeUSSManagement\_Notify

##### 5.4.2.4.1 General

This service operation is used by a UAE Server to notify a previously subscribed UASS either:

- on USS Change Policy Configuration completion status;

- on USS change (i.e. that a USS change was performed); or

- when USS change needs to be triggered.

The following procedures are supported by the "UAE\_ChangeUSSManagement\_Notify" service operation:

- USS Change Policy Configuration Status Notification.

- USS Change Notification.

- USS Change Trigger Notification.

##### 5.4.2.4.2 USS Change Policy Configuration Status Notification

Figure 5.4.2.4.2-1 depicts a scenario where the UAE Server sends a request to notify a previously subscribed UASS on the status of USS Change Policy Configuration (see also clause 7.6 of 3GPP°TS°23.255°[6]).



Figure 5.4.2.4.2-1: USS Change Policy Configuration Status Notification procedure

1. In order to notify a UASS on the status of USS Change Policy Configuration, the UAE Server shall send an HTTP POST request to the UASS with the request URI set to "{notifUri}/usschange-policy", where the "notifUri" is set to the value received from the UASS during the USS Change Policy Creation/Update procedure defined in clause 5.4.2.2, and the request body including the USSChangePolConfigNotif data structure.

If the UASS is not able to handle the notification request, it may respond with an HTTP "307 Temporary Redirect" status code or an HTTP "308 Permanent Redirect" status code including an HTTP "Location" header containing an alternative URI representing the end point of an alternative UASS where the notification should be sent, as defined in clause 5.2.10 of 3GPP TS 29.122 [2].

2a. Upon success, the UASS shall respond to the UAE Server with an HTTP "204 No Content" status code to acknowledge the reception of the notification.

2b. On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the HTTP POST response body, as specified in clause 6.3.7.

##### 5.4.2.4.3 USS Change Notification

Figure 5.4.2.4.3-1 depicts a scenario where the UAE Server sends a request to notify a previously subscribed UASS that a USS change was performed (see also clause 7.6 of 3GPP°TS°23.255°[6]).



Figure 5.4.2.4.3-1: USS Change Notification procedure

1. In order to notify a UASS that a USS change was performed, the UAE Server shall send an HTTP POST request to the UASS with the request URI set to "{notifUri}/usschange", where the "notifUri" is set to the value received from the UASS during the USS Change Policy Creation/Update procedure defined in clause 5.4.2.2, and the request body including the USSChangeNotif data structure.

If the UASS is not able to handle the notification request, it may respond with an HTTP "307 Temporary Redirect" status code or an HTTP "308 Permanent Redirect" status code including an HTTP "Location" header containing an alternative URI representing the end point of an alternative UASS where the notification should be sent, as defined in clause 5.2.10 of 3GPP TS 29.122 [2].

2a. Upon success, the UASS shall respond to the UAE Server with an HTTP "204 No Content" status code to acknowledge the reception of the notification.

2b. On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the HTTP POST response body, as specified in clause 6.3.7.

##### 5.4.2.4.4 USS Change Trigger Notification

Figure 5.4.2.4.4-1 depicts a scenario where the UAE Server sends a request to notify a previously subscribed UASS that a USS change should be triggered (see also clause 7.6 of 3GPP°TS°23.255°[6]).



Figure 5.4.2.4.4-1: USS Change Trigger Notification procedure

1. In order to notify a UASS that a USS change should be triggered, the UAE Server shall send an HTTP POST request to the UASS with the request URI set to "{notifUri}/usschange-trigger", where the "notifUri" is set to the value received from the UASS during the USS Change Policy Creation/Update procedure defined in clause 5.4.2.2, and the request body including the USSChangeTriggerNotif data structure.

If the UASS is not able to handle the notification request, it may respond with an HTTP "307 Temporary Redirect" status code or an HTTP "308 Permanent Redirect" status code including an HTTP "Location" header containing an alternative URI representing the end point of an alternative UASS where the notification should be sent, as defined in clause 5.2.10 of 3GPP TS 29.122 [2].

2a. Upon success, the UASS shall respond to the UAE Server with an HTTP "204 No Content" status code to acknowledge the reception of the notification.

2b. On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the HTTP POST response body, as specified in clause 6.3.7.

## 5.5 UAE\_DAASupport Service

### 5.5.1 Service Description

The UAE\_DAASupport service exposed by the UAE Server enables a UASS (e.g. USS/UTM) to:

- create/update/delete DAA Policies;

- receive DAA Policy Configuration Completion Status notifications;

- receive DAA Event notifications; and

- inform about and request the management of the detected DAA related events.

### 5.5.2 Service Operations

#### 5.5.2.1 Introduction

The service operations defined for the UAE\_DAASupport service are shown in table 5.5.2.1-1.

Table 5.5.2.1-1: UAE\_DAASupport Service Operations

|  |  |  |
| --- | --- | --- |
| Service Operation Name | Description | Initiated by |
| UAE\_DAASupport\_Manage | This service operation enables a UASS to create/update/delete a DAA Application Policy. | e.g. UASS |
| UAE\_DAASupport\_InformDAAEvent | This service operation enables a UASS to send the detected DAA related events. | e.g. UASS |
| UAE\_DAASupport\_Notify | This service operation enables a UAE Server to notify a previously subscribed UASS either:  - on DAA Policy Configuration Completion Status; or  - on detected DAA related events. | e.g. UASS |

#### 5.5.2.2 UAE\_DAASupport\_Manage

##### 5.5.2.2.1 General

This service operation is used by a UASS to request the creation/update/deletion of a DAA Policy at the UAE Server.

The following procedures are supported by the "UAE\_DAASupport\_Manage" service operation:

- DAA Policy Creation.

- DAA Policy Update.

- DAA Policy Deletion.

##### 5.5.2.2.2 DAA Policy Creation

Figure 5.5.2.2.2-1 depicts a scenario where a UASS sends a request to the UAE Server to create a DAA Policy (see also clause 7.7 of 3GPP°TS°23.255°[6]).



Figure 5.5.2.2.2-1: Procedure for DAA Policy Creation

1. In order to request the creation of a DAA Policy, the UASS shall send an HTTP POST request to the UAE Server targeting the "DAA Policies" resource, with the request body including the DAAPolReq data structure.

2a. Upon success, the UAE Server shall respond with an HTTP "201 Created" status code with the response body containing a representation of the created "Individual DAA Policy" resource and potentially additional information within the DAAPolResp data structure.

2b. On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the HTTP POST response body, as specified in clause 6.4.7.

##### 5.5.2.2.3 DAA Policy Update

Figure 5.5.2.2.2-1 depicts a scenario where a UASS sends a request to the UAE Server to update an existing DAA Policy (see also clause 7.7 of 3GPP°TS°23.255°[6]).



Figure 5.5.2.2.3-1: Procedure for DAA Policy Update

1. In order to request the update/modification of an existing DAA Policy, the UASS shall send an HTTP PUT/PATCH request to the UAE Server targeting the corresponding "Individual DAA Policy" resource, with the request body including the DAAPolicy data structure (in case the HTTP PUT method is used) or the DAAPolicyPatch data structure (in case the HTTP PATCH method is used).

NOTE: An alternative UASS (i.e. other than the one that requested the creation of the targeted resource) can initiate this request.

If the UAE Server is not able to handle the request, it may respond with an HTTP "307 Temporary Redirect" status code or an HTTP "308 Permanent Redirect" status code including an HTTP "Location" header containing an alternative URI of the resource located in an alternative UAE Server, as defined in clause 5.2.10 of 3GPP TS 29.122 [2].

2a. Upon success, the UAE Server shall respond with either:

- an HTTP "200 OK" status code with the response body containing a representation of the updated/modified "Individual DAA Policy" resource and potentially additional information within the DAAPolicy data structure; or

- an HTTP "204 No Content" status code.

2b. On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the HTTP PUT/PATCH response body, as specified in clause 6.4.7.

##### 5.5.2.2.3 DAA Policy Deletion

Figure 5.5.2.2.2-1 depicts a scenario where a UASS sends a request to the UAE Server to delete an existing DAA Policy (see also clause 7.7 of 3GPP°TS°23.255°[6]).



Figure 5.5.2.2.3-1: Procedure for DAA Policy Deletion

1. In order to request the deletion of an existing DAA Policy, the UASS shall send an HTTP DELETE request to the UAE Server targeting the corresponding "Individual DAA Policy" resource.

NOTE: An alternative UASS (i.e. other than the one that requested the creation of the targeted resource) can initiate this request.

2a. Upon success, the UAE Server shall respond with an HTTP "204 No Content" status code.

2b. On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the HTTP DELETE response body, as specified in clause 6.4.7.

#### 5.5.2.3 UAE\_DAASupport\_InformDAAEvent

##### 5.5.2.3.1 General

This service operation is used by a UASS to inform about and request the management of the detected DAA related event(s).

The following procedures are supported by the "UAE\_DAASupport\_InformDAAEvent" service operation:

- DAA Events Information Request.

##### 5.5.2.3.2 DAA Events Information Request

Figure 5.5.2.3.2-1 depicts a scenario where a UASS sends a request to the UAE Server to inform about and request the management of the detected DAA related event(s) (see also clause 7.7 of 3GPP°TS°23.255°[6]).



Figure 5.5.2.3.2-1: Procedure for DAA Events Information Request

1. In order to send DAA related event(s) information, the UASS shall send an HTTP POST request (custom operation: "InformDAAEvents") to the UAE Server, with the request URI set to "{apiRoot}/uae-daa/<apiVersion>/inform-events" and the request body including the InformDAAEventsReq data structure.

If the UAE Server is not able to handle the request, it may respond with an HTTP "307 Temporary Redirect" status code or an HTTP "308 Permanent Redirect" status code including an HTTP "Location" header containing an alternative URI of the resource located in an alternative UAE Server, as defined in clause 5.2.10 of 3GPP TS 29.122 [2].

2a. Upon success, the UAE Server shall respond with an HTTP "204 No Content" status code.

2b. On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the HTTP POST response body, as specified in clause 6.4.7.

#### 5.5.2.4 UAE\_DAASupport\_Notify

##### 5.5.2.4.1 General

This service operation is used by a UAE Server to notify a previously subscribed UASS either:

- on DAA Policy Configuration Completion Status; or

- on DAA related event(s).

The following procedures are supported by the "UAE\_DAASupport\_Notify" service operation:

- DAA Policy Configuration Completion Status Notification.

- DAA Event Notification.

##### 5.5.2.4.2 DAA Policy Configuration Completion Status Notification

Figure 5.5.2.4.2-1 depicts a scenario where the UAE Server sends a request to notify a previously subscribed UASS on the status of DAA Policy Configuration (see also clause 7.7 of 3GPP°TS°23.255°[6]).



Figure 5.5.2.4.2-1: DAA Policy Configuration Completion Status Notification procedure

1. In order to notify a UASS on the status of DAA Policy Configuration, the UAE Server shall send an HTTP POST request to the UASS with the request URI set to "{notifUri}/daa-policy", where the "notifUri" is set to the value received from the UASS during the DAA Policy Creation/Update procedure defined in clause 5.5.2.2, and the request body including the DAAPolConfigNotif data structure.

If the UASS is not able to handle the notification request, it may respond with an HTTP "307 Temporary Redirect" status code or an HTTP "308 Permanent Redirect" status code including an HTTP "Location" header containing an alternative URI representing the end point of an alternative UASS where the notification should be sent, as defined in clause 5.2.10 of 3GPP TS 29.122 [2].

2a. Upon success, the UASS shall respond to the UAE Server with an HTTP "204 No Content" status code to acknowledge the reception of the notification.

2b. On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the HTTP POST response body, as specified in clause 6.4.7.

##### 5.5.2.4.3 DAA Event Notification

Figure 5.5.2.4.3-1 depicts a scenario where the UAE Server sends a request to notify a previously subscribed UASS on DAA related event(s) (see also clause 7.7 of 3GPP°TS°23.255°[6]).



Figure 5.5.2.4.3-1: DAA Event Notification procedure

1. In order to notify a UASS on the detected DAA event(s), the UAE Server shall send an HTTP POST request to the UASS with the request URI set to "{notifUri}/daa-events", where the "notifUri" is set to the value received from the UASS during the DAA Policy Creation/Update procedure defined in clause 5.5.2.2, and the request body including the DAAEventsInfo data structure.

If the UASS is not able to handle the notification request, it may respond with an HTTP "307 Temporary Redirect" status code or an HTTP "308 Permanent Redirect" status code including an HTTP "Location" header containing an alternative URI representing the end point of an alternative UASS where the notification should be sent, as defined in clause 5.2.10 of 3GPP TS 29.122 [2].

2a. Upon success, the UASS shall respond to the UAE Server with either:

- an HTTP "200 OK" status code with the response body containing updated/additional DAA event(s) related information within the DAAEventsInfo data structure, if the UASS needs to provide information about additional DAA event(s) or updated DAA event(s) related information; or

- an HTTP "204 No Content" status code, if the UASS does not need to provide any updated/additional DAA event(s) related information.

2b. On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the HTTP POST response body, as specified in clause 6.4.7.

# 6 API Definitions

## 6.1 UAE\_C2OperationModeManagement Service API

### 6.1.1 Introduction

The UAE\_C2OperationModeManagement service shall use the UAE\_C2OperationModeManagement API.

The API URI of the UAE\_C2OperationModeManagement API shall be:

**{apiRoot}/<apiName>/<apiVersion>**

The request URIs used in HTTP requests shall have the Resource URI structure defined in clause 5.2.4 of 3GPP TS 29.122 [2], i.e.:

**{apiRoot}/<apiName>/<apiVersion>/<apiSpecificSuffixes>**

with the following components:

- The {apiRoot} shall be set as described in clause 5.2.4 of 3GPP TS 29.122 [2].

- The <apiName>shall be "uae-c2opmode-mngt".

- The <apiVersion> shall be "v1".

- The <apiSpecificSuffixes> shall be set as described in clause 5.2.4 of 3GPP TS 29.122 [2].

NOTE: When 3GPP TS 29.122 [2] is referenced for the common protocol and interface aspects for API definition in the clauses under clause 6.1, the UAE Server takes the role of the SCEF and the UASS takes the role of the SCS/AS.

### 6.1.2 Usage of HTTP

The provisions of clause 5.2.2 of 3GPP TS 29.122 [2] shall apply for the UAE\_C2OperationModeManagement API.

### 6.1.3 Resources

There are no resources defined for this API in this release of the specification.

### 6.1.4 Custom Operations without associated resources

#### 6.1.4.1 Overview

The structure of the custom operation URIs of the UAE\_C2OperationModeManagement API is shown in Figure 6.1.4.1-1.



Figure 6.1.4.1-1: Custom operation URI structure of the UAE\_C2OperationModeManagement API

Table 6.1.4.1-1 provides an overview of the custom operations and applicable HTTP methods defined for the UAE\_C2OperationModeManagement API.

Table 6.1.4.1-1: Custom operations without associated resources

|  |  |  |  |
| --- | --- | --- | --- |
| Operation name | Custom operation URI | Mapped HTTP method | Description |
| Initiate | /initiate | POST | Enables a UASS to request to provision C2 Operation Mode configuration information for a UAS (i.e. pair of UAV and UAV-C) to the UAE Server. |

#### 6.1.4.2 Operation: Initiate

##### 6.1.4.2.1 Description

The custom operation enables a UASS to initiate the configuration of C2 operation modes for a UAS (i.e. pair of UAV and UAV-C) by communicating the associated C2 Operation Mode configuration information to the UAE Server.

##### 6.1.4.2.2 Operation Definition

This operation shall support the request data structures and the response data structures and response codes specified in tables 6.1.4.2.2-1 and 6.1.4.2.2-2.

Table 6.1.4.2.2-1: Data structures supported by the POST Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| ConfigureData | M | 1 | Contains the parameters to request to provision C2 Operation Mode configuration information for a UAS (i.e. pair of UAV and UAV-C). |

Table 6.1.4.2.2-2: Data structures supported by the POST Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response  codes | Description |
| C2Result | M | 1 | 200 OK | The communicated C2 Operation Mode configuration information was successfully received.  The response body shall contain the feedback of the UAE Server on whether this C2 Operation Mode configuration request is confirmed (i.e. can be undertaken by the UAE Server) or not. |
| n/a |  |  | 307 Temporary Redirect | Temporary redirection. The response shall include a Location header field containing an alternative target URI located in an alternative UAE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| n/a |  |  | 308 Permanent Redirect | Permanent redirection. The response shall include a Location header field containing an alternative target URI located in an alternative UAE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2] |
| NOTE: The manadatory HTTP error status code for the HTTP POST method listed in table 5.2.6-1 of 3GPP TS 29.122 [2] also apply. | | | | |

Table 6.1.4.2.2-3: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | An alternative target URI located in an alternative UAE Server. |

Table 6.1.4.2.2-4: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | An alternative target URI located in an alternative UAE Server. |

### 6.1.5 Notifications

#### 6.1.5.1 General

Notifications shall comply to clause 5.2.5 of 3GPP TS 29.122 [2].

Table 6.1.5.1-1: Notifications overview

|  |  |  |  |
| --- | --- | --- | --- |
| Notification | Callback URI | HTTP method or custom operation | Description  (service operation) |
| C2 Operation Mode Management Completion Notification | {notificationUri}/c2mode-mngt-completion | c2mode-mngt-completion (POST) | This service operation enables a UAE Server to notify a previously subscribed UASS on the C2 operation mode management completion status for the concerned UAS (i.e. pair of UAV and UAV-C). |
| Selected C2 Communication Mode Notification | {notificationUri}/inform-selec-c2mode | inform-selec-c2mode (POST) | This service operation enables a UAE Server to notify a previously subscribed UASS on the C2 communication mode selected by the concerned UAS (i.e. pair of UAV and UAV-C). |
| C2 Communication Mode Switching Notification | {notificationUri}/inform-c2mode-switch | inform-c2mode-switch (POST) | This service operation enables a UAE Server to notify a previously subscribed UASS when C2 communication mode switching is carried out for the concerned UAS (i.e. pair of UAV and UAV-C) and possibly request confirmation from the UASS. |

#### 6.1.5.2 C2 Operation Mode Management Completion Notification

##### 6.1.5.2.1 Description

The C2 Operation Mode Management Completion Notification is used by a UAE Server to notify a previously subscribed UASS on the C2 operation mode management completion status for a UAS (i.e. pair of UAV and UAV-C).

##### 6.1.5.2.2 Target URI

The Callback URI **"{notificationUri}**/**c2mode-mngt-completion"** shall be used with the callback URI variables defined in table 6.1.5.2.2-1.

Table 6.1.5.2.2-1: Callback URI variables

|  |  |  |
| --- | --- | --- |
| Name | Data type | Definition |
| notificationUri | Uri | String formatted as a URI containing the Callback URI. |

##### 6.1.5.2.3 Standard Methods

###### 6.1.5.2.3.1 POST

This method shall support the request data structures specified in table 6.1.5.2.3.1-1 and the response data structures and response codes specified in table 6.1.5.2.3.1-2.

Table 6.1.5.2.3.1-1: Data structures supported by the POST Request Body

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| C2OpModeMngtCompStatus | M | 1 | Contains the C2 operation mode management completion status for the concerned UAS (i.e. pair of UAV and UAV-C). |

Table 6.1.5.2.3.1-2: Data structures supported by the POST Response Body

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response codes | Description |
| n/a |  |  | 204 No Content | The C2 operation mode management completion status for the concerned UAS (i.e. pair of UAV and UAV-C) is successfully received and acknowledged. |
| n/a |  |  | 307 Temporary Redirect | Temporary redirection. The response shall include a Location header field containing an alternative URI representing the end point of an alternative UASS where the notification should be sent.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| n/a |  |  | 308 Permanent Redirect | Permanent redirection. The response shall include a Location header field containing an alternative URI representing the end point of an alternative UASS where the notification should be sent.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| NOTE: The mandatory HTTP error status codes for the HTTP POST method listed in table 5.2.6-1 of 3GPP TS 29.122 [2] also apply. | | | | |

Table 6.1.5.2.3.1-3: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | An alternative URI representing the end point of an alternative UASS towards which the notification should be redirected. |

Table 6.1.5.2.3.1-4: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | An alternative URI representing the end point of an alternative UASS towards which the notification should be redirected. |

#### 6.1.5.3 Selected C2 Communication Mode Notification

##### 6.1.5.3.1 Description

The Selected C2 Communication Mode Notification is used by a UAE Server to notify a previously subscribed UASS on the C2 communication mode selected by a UAS (i.e. pair of UAV and UAV-C).

##### 6.1.5.3.2 Target URI

The Callback URI **"{notificationUri}**/**inform-selec-c2mode"** shall be used with the callback URI variables defined in table 6.1.5.3.2-1.

Table 6.1.5.3.2-1: Callback URI variables

|  |  |  |
| --- | --- | --- |
| Name | Data type | Definition |
| notificationUri | Uri | String formatted as a URI containing the Callback URI. |

##### 6.1.5.3.3 Standard Methods

###### 6.1.5.3.3.1 POST

This method shall support the request data structures specified in table 6.1.5.3.3.1-1 and the response data structures and response codes specified in table 6.1.5.3.3.1-2.

Table 6.1.5.3.3.1-1: Data structures supported by the POST Request Body

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| SelectedC2CommModeNotif | M | 1 | Contains information on the C2 Communication Mode selected by the concerned UAS (i.e. pair of UAV and UAV-C). |

Table 6.1.5.3.3.1-2: Data structures supported by the POST Response Body

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response codes | Description |
| n/a |  |  | 204 No Content | The C2 Communication Mode selected by the concerned UAS (i.e. pair of UAV and UAV-C) is successfully received and acknowledged. |
| n/a |  |  | 307 Temporary Redirect | Temporary redirection. The response shall include a Location header field containing an alternative URI representing the end point of an alternative UASS where the notification should be sent.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| n/a |  |  | 308 Permanent Redirect | Permanent redirection. The response shall include a Location header field containing an alternative URI representing the end point of an alternative UASS where the notification should be sent.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| NOTE: The mandatory HTTP error status codes for the HTTP POST method listed in table 5.2.6-1 of 3GPP TS 29.122 [2] also apply. | | | | |

Table 6.1.5.3.3.1-3: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | An alternative URI representing the end point of an alternative UASS towards which the notification should be redirected. |

Table 6.1.5.3.3.1-4: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | An alternative URI representing the end point of an alternative UASS towards which the notification should be redirected. |

#### 6.1.5.4 C2 Communication Mode Switching Notification

##### 6.1.5.4.1 Description

The C2 Communication Mode Switching Notification is used by a UAE Server to notify a previously subscribed UASS on the targeted C2 Communication Mode switching for a UAS (i.e. pair of UAV and UAV-C).

##### 6.1.5.4.2 Target URI

The Callback URI **"{notificationUri}**/**inform-c2mode-switch"** shall be used with the callback URI variables defined in table 6.1.5.4.2-1.

Table 6.1.5.4.2-1: Callback URI variables

|  |  |  |
| --- | --- | --- |
| Name | Data type | Definition |
| notificationUri | Uri | String formatted as a URI containing the Callback URI. |

##### 6.1.5.4.3 Standard Methods

###### 6.1.5.4.3.1 POST

This method shall support the request data structures specified in table 6.1.5.4.3.1-1 and the response data structures and response codes specified in table 6.1.5.4.3.1-2.

Table 6.1.5.4.3.1-1: Data structures supported by the POST Request Body

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| C2CommModeSwitchNotif | M | 1 | Contains information on the targeted C2 Communication Mode switching for the concerned UAS (i.e. pair of UAV and UAV-C). |

Table 6.1.5.4.3.1-2: Data structures supported by the POST Response Body

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response codes | Description |
| C2Result | M | 1 | 200 OK | The targeted C2 Communication Mode switching for the concerned UAS (i.e. pair of UAV and UAV-C) is successfully received.  The response body shall contain the feedback of the UASS on whether this C2 Communication Mode switching is confirmed (i.e. validated) or not. |
| n/a |  |  | 204 No Content | The targeted C2 Communication Mode switching for the concerned UAS (i.e. pair of UAV and UAV-C) is successfully received and acknowledged, and the UASS does not need to confirm (i.e. validate) it. |
| n/a |  |  | 307 Temporary Redirect | Temporary redirection. The response shall include a Location header field containing an alternative URI representing the end point of an alternative UASS where the notification should be sent.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| n/a |  |  | 308 Permanent Redirect | Permanent redirection. The response shall include a Location header field containing an alternative URI representing the end point of an alternative UASS where the notification should be sent.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| NOTE: The mandatory HTTP error status codes for the HTTP POST method listed in table 5.2.6-1 of 3GPP TS 29.122 [2] also apply. | | | | |

Table 6.1.5.4.3.1-3: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | An alternative URI representing the end point of an alternative UASS towards which the notification should be redirected. |

Table 6.1.5.4.3.1-4: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | An alternative URI representing the end point of an alternative UASS towards which the notification should be redirected. |

### 6.1.6 Data Model

#### 6.1.6.1 General

This clause specifies the application data model supported by the API.

Table 6.1.6.1-1 specifies the data types defined for the UAE\_C2OperationModeManagement API.

Table 6.1.6.1-1: UAE\_C2OperationModeManagement API specific Data Types

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | Clause defined | Description | Applicability |
| ConfigureData | 6.1.6.2.2 | Represents the parameters to request to provision C2 Operation Mode configuration information for a UAS (i.e. pair of UAV and UAV-C). |  |
| SelectedC2CommModeNotif | 6.1.6.2.3 | Represents information on the C2 Communication Mode slected by a UAS (i.e. pair of UAV and UAV-C). |  |
| C2CommModeSwitchNotif | 6.1.6.2.4 | Represents information on the targeted C2 Communication Mode switching for a UAS (i.e. pair of UAV and UAV-C). |  |
| C2LinkQualityThrlds | 6.1.6.2.11 | Represents the C2 link quality thresholds. |  |
| C2OpModeMngtCompStatus | 6.1.6.2.9 | Represents the C2 operation mode management completion status for a UAS (i.e. pair of UAV and UAV-C). |  |
| C2OpModeStatus | 6.1.6.3.6 | Represents the C2 operation mode management completion status. |  |
| C2Result | 6.1.6.2.5 | Represents the result of an action related to C2 of a UAS. |  |
| C2ServiceArea | 6.1.6.2.8 | Represents a C2 service area. |  |
| C2SwitchPolicies | 6.1.6.2.10 | Represents the C2 operation mode switching policies. |  |
| UasId | 6.1.6.2.6 | Represents the identifier of a UAS (i.e. pair of UAV and UAV-C). |  |
| UavId | 6.1.6.2.7 | Represents the identifier of a UAV (e.g. UAV, UAV-C). |  |
| C2CommMode | 6.1.6.3.3 | Represents the C2 Communication Modes. |  |
| C2CommModeSwitching | 6.1.6.3.4 | Represents the C2 Communication Mode Switching types. |  |
| C2SwitchingCause | 6.1.6.3.5 | Represents the C2 Communication Mode switching cause. |  |

Table 6.1.6.1-2 specifies data types re-used by the UAE\_C2OperationModeManagement API from other specifications, including a reference to their respective specifications, and when needed, a short description of their use within the UAE\_C2OperationModeManagement API.

Table 6.1.6.1-2: UAE\_C2OperationModeManagement API re-used Data Types

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | Reference | Comments | Applicability |
| ExternalGroupId | 3GPP TS 29.122 [2] | Represents an external group identifier. |  |
| GeographicArea | 3GPP TS 29.572 [8] | Represents a geographical area. |  |
| Gpsi | 3GPP TS 29.571 [7] | Represents a GPSI. |  |
| Ncgi | 3GPP TS 29.571 [7] | Represents an NCGI. |  |
| PacketLossRate | 3GPP TS 29.571 [7] | Represents the packet loss rate. |  |
| SupportedFeatures | 3GPP TS 29.571 [7] | Used to negotiate the applicability of the optional features. |  |
| Tai | 3GPP TS 29.571 [7] | Represents a tracking area identifier. |  |
| Uri | 3GPP TS 29.122 [2] | Represents a URI. |  |

#### 6.1.6.2 Structured data types

##### 6.1.6.2.1 Introduction

This clause defines the structures to be used in resource representations.

##### 6.1.6.2.2 Type: ConfigureData

Table 6.1.6.2.2-1: Definition of type ConfigureData

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| uassId | Uri | M | 1 | Contains the identity of the UASS communicating the C2 Operation Mode configuration information for a UAS (i.e. pair of UAV and UAV-C). It takes the form of a URI. |  |
| uasId | UasId | M | 1 | Contains the identity of the UAS (i.e. pair of UAV and UAV-C) to which the provided C2 Operation Mode configuration information is destined.  This shall be either in the form of a UAS identifier (e.g. group ID) or a collection of individual identifiers (e.g. CAA level UAV ID, GPSI) of the UAV and UAV-C composing the UAS. |  |
| allowedC2CommModes | array(C2CommMode) | M | 1..N | Contains the allowed C2 communication modes for the UAS (i.e. pair of UAV and UAV-C) identified by the "uasId" attribute. |  |
| c2CommModeSwitchTypes | array(C2CommModeSwitching) | M | 1..N | Contains the C2 Communication Mode switching types to be supported by the UAE Server for the UAS (i.e. pair of UAV and UAV-C) identified by the "uasId" attribute. The possible switching types are:  - from "Direct C2 Communication" to "Network-Assisted C2 Communication";  - from "Network-Assisted C2 Communication" to "Direct C2 Communication";  - from "Direct C2 Communication" to "UTM-Navigated C2 Communication"; and/or  - from "Network-Assisted C2 Communication" to "UTM-Navigated C2 Communication". |  |
| notificationUri | Uri | M | 1 | Contains the notification URI via which the UASS desires to receive notifications from the UAE Server. |  |
| primaryC2CommMode | C2CommMode | M | 1 | Contains the primary C2 communication mode to be used by the UAS (i.e. pair of UAV and UAV-C) identified by the "uasId" attribute. It shall be set to either "DIRECT\_C2\_COMMUNICATION" or "NETWORK\_ASSISTED\_C2\_COMMUNICATION". |  |
| secondaryC2CommMode | C2CommMode | O | 0..1 | Contains the secondary C2 communication mode to be used by the UAS (i.e. pair of UAV and UAV-C) identified by the "uasId" attribute. When provided, it shall be set to either "DIRECT\_C2\_COMMUNICATION" or "NETWORK\_ASSISTED\_C2\_COMMUNICATION". |  |
| c2SwitchPolicies | C2SwitchPolicies | M | 1 | Contains the C2 operation mode switching policies. |  |
| c2ServiceArea | C2ServiceArea | O | 0..1 | Contains the service area within which the C2 operation mode management request applies. This shall be either a geographical area or a topological area. |  |
| suppFeat | SupportedFeatures | C | 0..1 | Contains the list of supported features among the ones defined in clause 6.1.8.  This attribute shall be provided if at least one feature is supported by the UASS. |  |

##### 6.1.6.2.3 Type: SelectedC2CommModeNotif

Table 6.1.6.2.3-1: Definition of type SelectedC2CommModeNotif

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| uasId | UasId | M | 1 | Contains the identity of the UAS (i.e. pair of UAV and UAV-C) to which the notification is related.  This shall be either in form of a UAS identifier (e.g. group ID) or a collection of individual identifiers (e.g. CAA level UAV ID, GPSI) of the UAV and UAV-C composing the UAS. |  |
| selPrimaryC2CommMode | C2CommMode | M | 1 | Contains the primary C2 communication mode selected by the UAS (i.e. pair of UAV and UAV-C) identified by the "uasId" attribute. It shall be set to either "DIRECT\_C2\_COMMUNICATION" or "NETWORK\_ASSISTED\_C2\_COMMUNICATION". |  |
| selSecondaryC2CommMode | C2CommMode | O | 0..1 | Contains the secondary C2 communication mode to be used by the UAS (i.e. pair of UAV and UAV-C) identified by the "uasId" attribute. When provided, it shall be set to either "DIRECT\_C2\_COMMUNICATION" or "NETWORK\_ASSISTED\_C2\_COMMUNICATION". |  |

##### 6.1.6.2.4 Type: C2CommModeSwitchNotif

Table 6.1.6.2.4-1: Definition of type C2CommModeSwitchNotif

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| uaeServerId | Uri | M | 1 | Contains the identifier of the UAE Server that is sending the notification and requesting C2 Communication Mode switching confirmation for a UAS (i.e. pair of UAV and UAV-C) from the UASS. |  |
| uasId | UasId | M | 1 | Contains the identifier of the UAS (i.e. pair of UAV and UAV-C) to which the provided C2 Communication Mode switching information is related.  This shall be either in form of a UAS identifier (e.g. group ID) or a collection of individual identifiers (e.g. CAA level UAV ID, GPSI) of the UAV and UAV-C composing the UAS. |  |
| c2CommModeSwitchType | C2CommModeSwitching | M | 1 | Contains the targeted C2 Communication Mode switching for the UAS (i.e. pair of UAV and UAV-C) identified by the "uasId" attribute. |  |
| switchingCause | C2SwitchingCause | O | 0..1 | Contains the cause that triggers the C2 Communication Mode switching. |  |

##### 6.1.6.2.5 Type: C2Result

Table 6.1.6.2.5-1: Definition of type C2Result

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| c2OpConfirmed | Boolean | M | 1 | This attribute indicates whether the requested action (e.g. targeted C2 Communication Mode switching, C2 Operation Mode configuration information provisioning) is confirmed or not.  - "true" means that the requested action is confirmed or approved.  - "false" means that the requested action is not confirmed or not approved. |  |
| suppFeat | SupportedFeatures | C | 0..1 | Indicates the list of negotiated supported features.  This attribute shall be provided by the UAE Server in the response to a request in which the UASS provided the list of features that it supports. |  |

##### 6.1.6.2.6 Type: UasId

Table 6.1.6.2.6-1: Definition of type UasId

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| groupId | ExternalGroupId | C | 0..1 | Contains the identity of a UAS (i.e. a pair of UAV and UAV-C) in the form of a group identifier.  (NOTE) |  |
| individualUasId | array(UavId) | C | 0..N | Contains the identity of a UAS (i.e. a pair of UAV and UAV-C) in the form of a collection of individual identifiers of the UAV and UAV-C composing the UAS.  (NOTE) |  |
| NOTE: The "groupId" attribute and the "individualUasId" attribute are mutually exclusive. | | | | | |

##### 6.1.6.2.7 Type: UavId

Table 6.1.6.2.7-1: Definition of type UavId

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| gpsi | Gpsi | C | 0..1 | Contains the identity of a UAV or UAV-C in the form of a GPSI.  (NOTE) |  |
| caaId | string | C | 0..1 | Contains the identity of a UAV or UAV-C in the form of a CAA level UAV ID.  (NOTE) |  |
| NOTE: At least one of the "groupId" attribute or the "caaId" attribute shall be provided within the UavId data type. | | | | | |

##### 6.1.6.2.8 Type: C2ServiceArea

Table 6.1.6.2.8-1: Definition of type C2ServiceArea

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| ncgiList | array(Ncgi) | C | 0..N | Contains a list of NR cell identifier(s) that constitutes the C2 service area. |  |
| taiList | array(Tai) | C | 0..N | Contains a list of tracking area identifier(s) that constitutes the C2 service area. |  |
| geographicAreaList | array(GeographicArea) | C | 0..N | Contains a list of geographic area(s) that constitutes the C2 service area. |  |
| NOTE: Either the "geographicAreaList" attribute or the "ncgiList" attribute and/or the "taiList" attribute shall be provided. | | | | | |

##### 6.1.6.2.9 Type: C2OpModeMngtCompStatus

Table 6.1.6.2.9-1: Definition of type C2OpModeMngtCompStatus

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| uasId | UasId | M | 1 | Contains the identifier of the UAS (i.e. pair of UAV and UAV-C) to which the provided C2 operation mode management completion status information is related. |  |
| status | C2OpModeStatus | M | 1 | Contains the C2 operation mode management completion status. |  |

##### 6.1.6.2.10 Type: C2SwitchPolicies

Table 6.1.6.2.10-1: Definition of type C2SwitchPolicies

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| directC2LinkQualityThrlds | C2LinkQualityThrlds | O | 0..1 | Contains the threshold(s) used to evaluate the quality of the direct C2 link. |  |
| uuC2LinkQualityThrlds | C2LinkQualityThrlds | O | 0..1 | Contains the threshold(s) used to evaluate the quality of the Network-Assisted (i.e. Uu based) C2 link. |  |
| NOTE: Either the "directC2LinkQualityThrlds" attribute, the "uuC2LinkQualityThrlds" attribute or both shall be provided. | | | | | |

##### 6.1.6.2.11 Type: C2LinkQualityThrlds

Table 6.1.6.2.11-1: Definition of type C2LinkQualityThrlds

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| nrRsrpThrldLow | integer | O | 0..1 | Represents the lower RSRP value threshold for the direct C2 link.  Value range: 0-127.  (NOTE 1) |  |
| nrRsrpThrldHigh | integer | O | 0..1 | Represents the upper RSRP value threshold for the direct C2 link.  Value range: 0-127.  (NOTE 2) |  |
| nrRsrqThrldLow | integer | O | 0..1 | Represents the lower RSRQ value threshold for the direct C2 link.  Value range: 0-127.  (NOTE 1) |  |
| nrRsrqThrldHigh | integer | O | 0..1 | Represents the upper RSRQ value threshold for the direct C2 link.  Value range: 0-127.  (NOTE 2) |  |
| packetLossThrldLow | PacketLossRate | O | 0..1 | Represents the lower packet loss rate value threshold for the direct C2 link.  (NOTE 1) |  |
| packetLossThrldHigh | PacketLossRate | O | 0..1 | Represents the upper packet loss rate value threshold for the direct C2 link.  (NOTE 2) |  |
| NOTE 1: At least one of the "nrRsrpThrldLow", "nrRsrqThrldLow" or "packetLossThrldLow" attributes shall be provided.  NOTE 2: At least one of the "nrRsrpThrldHigh", "nrRsrqThrldHigh" or "packetLossThrldHigh" attributes shall be provided. | | | | | |

#### 6.1.6.3 Simple data types and enumerations

##### 6.1.6.3.1 Introduction

This clause defines simple data types and enumerations that can be referenced from data structures defined in the previous clauses.

##### 6.1.6.3.2 Simple data types

The simple data types defined in table 6.1.6.3.2-1 shall be supported.

Table 6.1.6.3.2-1: Simple data types

|  |  |  |  |
| --- | --- | --- | --- |
| Type Name | Type Definition | Description | Applicability |
|  |  |  |  |

##### 6.1.6.3.3 Enumeration: C2CommMode

The enumeration C2CommMode represents C2 Communication Modes. It shall comply with the provisions of table 6.1.6.3.3-1.

Table 6.1.6.3.3-1: Enumeration C2CommMode

|  |  |  |
| --- | --- | --- |
| Enumeration value | Description | Applicability |
| DIRECT\_C2\_COMMUNICATION | Represents Direct C2 Communication mode. |  |
| NETWORK\_ASSISTED\_C2\_COMMUNICATION | Represents Network-Assisted C2 Communication mode. |  |
| UTM\_NAVIGATED\_C2\_COMMUNICATION | Represents UTM-Navigated C2 communication mode. |  |

##### 6.1.6.3.4 Enumeration: C2CommModeSwitching

The enumeration C2CommModeSwitching represents C2 Communication Mode Switching types. It shall comply with the provisions of table 6.1.6.3.4-1.

Table 6.1.6.3.4-1: Enumeration C2CommModeSwitching

|  |  |  |
| --- | --- | --- |
| Enumeration value | Description | Applicability |
| DIRECT\_TO\_NETWORK\_ASSISTED\_C2 | Represents the C2 Communication Mode switching from Direct C2 Communication mode to Network-Assisted C2 Communication mode. |  |
| NETWORK\_ASSISTED\_TO\_DIRECT\_C2 | Represents the C2 Communication Mode switching from Network-Assisted C2 Communication mode to Direct C2 Communication mode. |  |
| DIRECT\_TO\_UTM\_NAVIGATED\_C2 | Represents the C2 Communication Mode switching from Direct C2 Communication mode to UTM-Navigated C2 communication mode. |  |
| NETWORK\_ASSISTED\_TO\_UTM\_NAVIGATED\_C2 | Represents the C2 Communication Mode switching from Network-Assisted C2 Communication mode to UTM-Navigated C2 communication mode. |  |

##### 6.1.6.3.5 Enumeration: C2SwitchingCause

The enumeration C2SwitchingCause represents the C2 Communication Mode switching cause. It shall comply with the provisions of table 6.1.6.3.5-1.

Table 6.1.6.3.5-1: Enumeration C2SwitchingCause

|  |  |  |
| --- | --- | --- |
| Enumeration value | Description | Applicability |
| DIRECT\_LINK\_QUALITY\_DEGRADATION | Indicates that the C2 Communication Mode switching was triggered due to a degradation in the direct radio link quality. |  |
| DIRECT\_LINK\_AVAILABLE | Indicates that the C2 Communication Mode switching was triggered due to the availability of a direct link, i.e. direct radio link quality enables its usage. |  |
| MOVING\_BVLOS | Indicates that the C2 Communication Mode switching was triggered due to the UAV moving BVLOS. |  |
| LOCATION\_CHANGE | Indicates that the C2 Communication Mode switching was triggered due to an actual or expected location/mobility of the UAV (e.g. which impacts the UAV-to-UAV-C location). |  |
| TRAFFIC\_CONTROL\_NEEDED | Indicates that the C2 Communication Mode switching was triggered due to the necessity to have air traffic control. |  |
| SECURITY\_REASONS | Indicates that the C2 Communication Mode switching was triggered due to security reasons. |  |
| OTHER\_REASONS | Indicates that the C2 Communication Mode switching was triggered due to other reasons (e.g. unpredictable event, unknown reason, weather conditions, topography, etc.). |  |

##### 6.1.6.3.6 Enumeration: C2OpModeStatus

The enumeration C2OpModeStatus represents C2 Operation Mode Management Completion status. It shall comply with the provisions of table 6.1.6.3.6-1.

Table 6.1.6.3.6-1: Enumeration C2CommMode

|  |  |  |
| --- | --- | --- |
| Enumeration value | Description | Applicability |
| SUCCESSFUL | Indicates that the C2 operation mode configuration was successful. |  |
| NOT\_SUCCESSFUL | Indicates that the C2 operation mode configuration was not successful. |  |

#### 6.1.6.4 Data types describing alternative data types or combinations of data types

There are no data types describing alternative data types or combinations of data types defined for this API in this release of the specification.

#### 6.1.6.5 Binary data

##### 6.1.6.5.1 Binary Data Types

Table 6.1.6.5.1-1: Binary Data Types

|  |  |  |
| --- | --- | --- |
| Name | Clause defined | Content type |
|  |  |  |

### 6.1.7 Error Handling

#### 6.1.7.1 General

For the UAE\_C2OperationModeManagement API, HTTP error responses shall be supported as specified in clause 5.2.6 of 3GPP TS 29.122 [2]. Protocol errors and application errors specified in clause 5.2.6 of 3GPP TS 29.122 [2] shall be supported for the HTTP status codes specified in table 5.2.6-1 of 3GPP TS 29.122 [2].

In addition, the requirements in the following clauses are applicable for the UAE\_C2OperationModeManagement API.

#### 6.1.7.2 Protocol Errors

No specific protocol errors for the UAE\_C2OperationModeManagement API are specified.

#### 6.1.7.3 Application Errors

The application errors defined for the UAE\_C2OperationModeManagement API are listed in Table 6.1.7.3-1.

Table 6.1.7.3-1: Application errors

|  |  |  |
| --- | --- | --- |
| Application Error | HTTP status code | Description |
|  |  |  |

### 6.1.8 Feature negotiation

The optional features listed in table 6.1.8-1 are defined for the UAE\_C2OperationModeManagement API. They shall be negotiated using the extensibility mechanism defined in clause 5.2.7 of 3GPP TS 29.122 [2].

Table 6.1.8-1: Supported Features

|  |  |  |
| --- | --- | --- |
| Feature number | Feature Name | Description |
|  |  |  |

### 6.1.9 Security

The provisions of clause 6 of 3GPP TS 29.122 [2] shall apply for the UAE\_C2OperationModeManagement API.

## 6.2 UAE\_RealtimeUAVStatus Service API

### 6.2.1 Introduction

The UAE\_RealtimeUAVStatus service shall use the UAE\_RealtimeUAVStatus API.

The API URI of the UAE\_RealtimeUAVStatus API shall be:

**{apiRoot}/<apiName>/<apiVersion>**

The request URIs used in HTTP requests shall have the Resource URI structure defined in clause 5.2.4 of 3GPP TS 29.122 [2], i.e.:

**{apiRoot}/<apiName>/<apiVersion>/<apiSpecificSuffixes>**

with the following components:

- The {apiRoot} shall be set as described in clause 5.2.4 of 3GPP TS 29.122 [2].

- The <apiName>shall be "uae-uav-status".

- The <apiVersion> shall be "v1".

- The <apiSpecificSuffixes> shall be set as described in clause 5.2.4 of 3GPP TS 29.122 [2].

NOTE: When 3GPP TS 29.122 [2] is referenced for the common protocol and interface aspects for API definition in the clauses under clause 6.2, the UAE Server takes the role of the SCEF and the UASS takes the role of the SCS/AS.

### 6.2.2 Usage of HTTP

The provisions of clause 5.2.2 of 3GPP TS 29.122 [2] shall apply for the UAE\_RealtimeUAVStatus API.

### 6.2.3 Resources

#### 6.2.3.1 Overview

This clause describes the structure for the Resource URIs and the resources and methods used for the service.

Figure 6.2.3.1-1 depicts the resource URIs structure for the UAE\_RealtimeUAVStatus API.



Figure 6.2.3.1-1: Resource URIs structure of the UAE\_RealtimeUAVStatus API

Table 6.2.3.1-1 provides an overview of the resources and applicable HTTP methods for the UAE\_RealtimeUAVStatus API.

Table 6.2.3.1-1: Resources and methods overview

|  |  |  |  |
| --- | --- | --- | --- |
| Resource name | Resource URI | HTTP method or custom operation | Description |
| Real-time UAV Status Subscriptions | /subscriptions | GET | Retrieve all the active real-time UAV status subscriptions managed by the UAE Server. |
| POST | Request the creation of a subscription to real-time UAV status reporting. |
| Individual Real-time UAV Status Subscription | /subscriptions/{subscriptionId} | GET | Retrieve a real-time UAV status subscription resource identified by the provided subscription identifier. |
| PUT | Update an existing real-time UAV status subscription resource identified by the provided subscription identifier. |
| DELETE | Request the deletion of a real-time UAV status subscription resource identified by the provided subscription identifier. |

#### 6.2.3.2 Resource: Real-time UAV Status Subscriptions

##### 6.2.3.2.1 Description

This resource represents the collection of real-time UAV status subscriptions managed by the UAE Server.

##### 6.2.3.2.2 Resource Definition

Resource URI: **{apiRoot}/uae-uav-status/<apiVersion>/subscriptions**

This resource shall support the resource URI variables defined in table 6.2.3.2.2-1.

Table 6.2.3.2.2-1: Resource URI variables for this resource

|  |  |  |
| --- | --- | --- |
| Name | Data type | Definition |
| apiRoot | string | See clause 5.2.4 of 3GPP TS 29.122 [2]. |

##### 6.2.3.2.3 Resource Standard Methods

###### 6.2.3.2.3.1 GET

The GET method allows a UASS to retrieve all the active real-time UAV status subscriptions managed by the UAE Server.This method shall support the URI query parameters specified in table 6.2.3.2.3.1-1.

Table 6.2.3.2.3.1-1: URI query parameters supported by the GET method on this resource

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description | Applicability |
| n/a |  |  |  |  |  |

This method shall support the request data structures specified in table 6.2.3.2.3.1-2 and the response data structures and response codes specified in table 6.2.3.2.3.1-3.

Table 6.2.3.2.3.1-2: Data structures supported by the GET Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| n/a |  |  |  |

Table 6.2.3.2.3.1-3: Data structures supported by the GET Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response  codes | Description |
| array(RTUavStatusSubsc) | M | 1..N | 200 OK | Successful case. All the active real-time UAV status subscriptions managed by the UAE Server shall be returned. |
| n/a |  |  | 307 Temporary Redirect | Temporary redirection. The response shall include a Location header field containing an alternative URI of the resource located in an alternative UAE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| n/a |  |  | 308 Permanent Redirect | Permanent redirection. The response shall include a Location header field containing an alternative URI of the resource located in an alternative UAE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| NOTE: The manadatory HTTP error status code for the HTTP GET method listed in table 5.2.6-1 of 3GPP TS 29.122 [2] also apply. | | | | |

Table 6.2.3.2.3.1-4: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | An alternative URI of the resource located in an alternative UAE Server. |

Table 6.2.3.2.3.1-5: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | An alternative URI of the resource located in an alternative UAE Server. |

###### 6.2.3.2.3.2 POST

The POST method allows a UASS to request the creation of a subscription to real-time UAV status reporting at the UAE Server. This method shall support the URI query parameters specified in table 6.2.3.2.3.2-1.

Table 6.2.3.2.3.2-1: URI query parameters supported by the POST method on this resource

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description | Applicability |
| n/a |  |  |  |  |  |

This method shall support the request data structures specified in table 6.2.3.2.3.2-2 and the response data structures and response codes specified in table 6.2.3.2.3.2-3.

Table 6.2.3.2.3.2-2: Data structures supported by the POST Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| RTUavStatusSubsc | M | 1 | Represents the parameters to request the creation of a subscription to real-time UAV status reporting. |

Table 6.2.3.2.3.2-3: Data structures supported by the POST Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response  codes | Description |
| RTUavStatusSubsc | M | 1 | 201 Created | Successful case. The subscription is successfully created and a representation of the created Individual Real-time UAV Status Subscription resource shall be returned.  An HTTP "Location" header that contains the resource URI of the created Individual Real-time UAV Status Subscription resource shall also be included. |
| NOTE: The manadatory HTTP error status code for the HTTP POST method listed in table 5.2.6-1 of 3GPP TS 29.122 [2] also apply. | | | | |

Table 6.2.3.2.3.2-4: Headers supported by the 201 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains the URI of the newly created resource, according to the structure: {apiRoot}/uae-uav-status/<apiVersion>/subscriptions/{subscriptionId} |

##### 6.2.3.2.4 Resource Custom Operations

There are no resource custom operations defined for this resource in this release of the specification.

#### 6.2.3.3 Resource: Individual Real-time UAV Status Subscription

##### 6.2.3.3.1 Description

This resource represents an individual real-time UAV status subscription managed by the UAE Server.

##### 6.2.3.3.2 Resource Definition

Resource URI: **{apiRoot}/uae-uav-status/<apiVersion>/subscriptions/{subscriptionId}**

This resource shall support the resource URI variables defined in table 6.2.3.3.2-1.

Table 6.2.3.3.2-1: Resource URI variables for this resource

|  |  |  |
| --- | --- | --- |
| Name | Data type | Definition |
| apiRoot | string | See clause 5.2.4 of 3GPP TS 29.122 [2]. |
| subscriptionId | string | Represents the subscription identifier. |

##### 6.2.3.3.3 Resource Standard Methods

###### 6.2.3.3.3.1 GET

The GET method allows a UASS to retrieve a real-time UAV status subscription identified by the subscription identifier included in the request URI (i.e. within the "/{subscriptionId}" path segment).This method shall support the URI query parameters specified in table 6.2.3.3.3.1-1.

Table 6.2.3.3.3.1-1: URI query parameters supported by the GET method on this resource

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description | Applicability |
| n/a |  |  |  |  |  |

This method shall support the request data structures specified in table 6.2.3.3.3.1-2 and the response data structures and response codes specified in table 6.2.3.3.3.1-3.

Table 6.2.3.3.3.1-2: Data structures supported by the GET Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| n/a |  |  |  |

Table 6.2.3.3.3.1-3: Data structures supported by the GET Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response  codes | Description |
| RTUavStatusSubsc | M | 1 | 200 OK | Successful case. The requested Individual Real-time UAV Status Subscription resource shall be returned. |
| n/a |  |  | 307 Temporary Redirect | Temporary redirection. The response shall include a Location header field containing an alternative URI of the resource located in an alternative UAE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| n/a |  |  | 308 Permanent Redirect | Permanent redirection. The response shall include a Location header field containing an alternative URI of the resource located in an alternative UAE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| NOTE: The manadatory HTTP error status code for the HTTP GET method listed in table 5.2.6-1 of 3GPP TS 29.122 [2] also apply. | | | | |

Table 6.2.3.3.3.1-4: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | An alternative URI of the resource located in an alternative UAE Server. |

Table 6.2.3.3.3.1-5: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | An alternative URI of the resource located in an alternative UAE Server. |

###### 6.2.3.3.3.2 PUT

The PUT method allows a UASS to request the update of an existing real-time UAV status subscription identified by the subscription identifier included in the request URI (i.e. within the "/{subscriptionId}" path segment). This method shall support the URI query parameters specified in table 6.2.3.3.3.2-1.

Table 6.2.3.3.3.2-1: URI query parameters supported by the PUT method on this resource

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description | Applicability |
| n/a |  |  |  |  |  |

This method shall support the request data structures specified in table 6.2.3.3.3.2-2 and the response data structures and response codes specified in table 6.2.3.3.3.2-3.

Table 6.2.3.3.3.2-2: Data structures supported by the PUT Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| RTUavStatusSubsc | M | 1 | Represents the parameters to request the update of an existing subscription to real-time UAV status reporting. |

Table 6.2.3.3.3.2-3: Data structures supported by the PUT Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response  codes | Description |
| RTUavStatusSubsc | M | 1 | 200 OK | Successful case. The real-time UAV status subscription is successfully updated and a representation of the updated Individual Real-time UAV Status Subscription resource shall be returned. |
| n/a |  |  | 204 No Content | Successful case. The real-time UAV status subscription is successfully updated. |
| n/a |  |  | 307 Temporary Redirect | Temporary redirection. The response shall include a Location header field containing an alternative URI of the resource located in an alternative UAE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| n/a |  |  | 308 Permanent Redirect | Permanent redirection. The response shall include a Location header field containing an alternative URI of the resource located in an alternative UAE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| NOTE: The manadatory HTTP error status code for the HTTP PUT method listed in table 5.2.6-1 of 3GPP TS 29.122 [2] also apply. | | | | |

Table 6.2.3.3.3.2-4: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | An alternative URI of the resource located in an alternative UAE Server. |

Table 6.2.3.3.3.2-5: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | An alternative URI of the resource located in an alternative UAE Server. |

###### 6.2.3.3.3.3 DELETE

The DELETE method allows a UASS to request the deletion of an existing real-time UAV status subscription identified by the subscription identifier included in the request URI (i.e. within the "/{subscriptionId}" path segment). This method shall support the URI query parameters specified in table 6.2.3.3.3.3-1.

Table 6.2.3.3.3.3-1: URI query parameters supported by the DELETE method on this resource

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description | Applicability |
| n/a |  |  |  |  |  |

This method shall support the request data structures specified in table 6.2.3.3.3.3-2 and the response data structures and response codes specified in table 6.2.3.3.3.3-3.

Table 6.2.3.3.3.3-2: Data structures supported by the DELETE Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| n/a |  |  |  |

Table 6.2.3.3.3.3-3: Data structures supported by the DELETE Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response  codes | Description |
| n/a |  |  | 204 No Content | Successful case. The real-time UAV status subscription is successfully deleted. |
| n/a |  |  | 307 Temporary Redirect | Temporary redirection. The response shall include a Location header field containing an alternative URI of the resource located in an alternative UAE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| n/a |  |  | 308 Permanent Redirect | Permanent redirection. The response shall include a Location header field containing an alternative URI of the resource located in an alternative UAE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| NOTE: The manadatory HTTP error status code for the HTTP DELETE method listed in table 5.2.6-1 of 3GPP TS 29.122 [2] also apply. | | | | |

Table 6.2.3.3.3.3-4: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | An alternative URI of the resource located in an alternative UAE Server. |

Table 6.2.3.3.3.3-5: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | An alternative URI of the resource located in an alternative UAE Server. |

##### 6.2.3.3.4 Resource Custom Operations

There are no resource custom operations defined for this resource in this release of the specification.

### 6.2.4 Custom Operations without associated resources

There are no custom operations without associated resources defined for this API in this release of the specification.

### 6.2.5 Notifications

#### 6.2.5.1 General

Notifications shall comply to clause 5.2.5 of 3GPP TS 29.122 [2].

Table 6.2.5.1-1: Notifications overview

|  |  |  |  |
| --- | --- | --- | --- |
| Notification | Callback URI | HTTP method or custom operation | Description  (service operation) |
| Real-time UAV Status Notification | {notificationUri}/uav-status | uav-status (POST) | This service operation enables a UAE Server to notify a previously subscribed UASS on the real-time UAV status information. |

#### 6.2.5.2 Real-time UAV Status Notification

##### 6.2.5.2.1 Description

The Real-time UAV Status Notification is used by a UAE Server to notify a previously subscribed UASS on the real-time UAV status information.

##### 6.2.5.2.2 Target URI

The Callback URI **"{notificationUri}**/**uav-status"** shall be used with the callback URI variables defined in table 6.2.5.2.2-1.

Table 6.2.5.2.2-1: Callback URI variables

|  |  |  |
| --- | --- | --- |
| Name | Data type | Definition |
| notificationUri | Uri | String formatted as a URI containing the Callback URI. |

##### 6.2.5.2.3 Standard Methods

###### 6.2.5.2.3.1 POST

This method shall support the request data structures specified in table 6.2.5.2.3.1-1 and the response data structures and response codes specified in table 6.2.5.2.3.1-2.

Table 6.2.5.2.3.1-1: Data structures supported by the POST Request Body

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| RTUavStatusNotif | M | 1 | Represents a real-time UAV status notification. |

Table 6.2.5.2.3.1-2: Data structures supported by the POST Response Body

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response codes | Description |
| n/a |  |  | 204 No Content | Successful case. The real-time UAV status notification is successfully received and acknowledged. |
| n/a |  |  | 307 Temporary Redirect | Temporary redirection. The response shall include a Location header field containing an alternative URI representing the end point of an alternative UASS where the notification should be sent.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| n/a |  |  | 308 Permanent Redirect | Permanent redirection. The response shall include a Location header field containing an alternative URI representing the end point of an alternative UASS where the notification should be sent.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| NOTE: The mandatory HTTP error status codes for the HTTP POST method listed in table 5.2.6-1 of 3GPP TS 29.122 [2] also apply. | | | | |

Table 6.2.5.2.3.1-3: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | An alternative URI representing the end point of an alternative UASS towards which the notification should be redirected. |

Table 6.2.5.2.3.1-4: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | An alternative URI representing the end point of an alternative UASS towards which the notification should be redirected. |

### 6.2.6 Data Model

#### 6.2.6.1 General

This clause specifies the application data model supported by the API.

Table 6.2.6.1-1 specifies the data types defined for the UAE\_RealtimeUAVStatus API.

Table 6.2.6.1-1: UAE\_RealtimeUAVStatus API specific Data Types

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | Clause defined | Description | Applicability |
| RTUavStatusSubsc | 6.2.6.2.2 | Represents the parameters to request the creation of a subscription to real-time UAV status reporting. |  |
| RTUavStatusNotif | 6.2.6.2.3 | Represents a real-time UAV status notification. |  |
| RTUavStatus | 6.2.6.2.4 | Represents real-time UAV status information. |  |
| UavNetConnStatus | 6.2.6.2.5 | Represents the UAV network connection status information. |  |

Table 6.2.6.1-2 specifies data types re-used by the UAE\_RealtimeUAVStatus API from other specifications, including a reference to their respective specifications, and when needed, a short description of their use within the UAE\_RealtimeUAVStatus API.

Table 6.2.6.1-2: UAE\_RealtimeUAVStatus API re-used Data Types

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | Reference | Comments | Applicability |
| DateTime | 3GPP TS 29.122 [2] | Represents a date and a time. |  |
| MonitoringType | 3GPP TS 29.122 [2] | Represents a monitoring event type. |  |
| LocationInfo | 3GPP TS 29.122 [2] | Represents user location information. |  |
| SupportedFeatures | 3GPP TS 29.571 [7] | Used to negotiate the applicability of the optional features. |  |
| UavId | Clause 6.1.6.2.7 | Represents a UAV identifier. |  |
| Uri | 3GPP TS 29.122 [2] | Represents a URI. |  |

#### 6.2.6.2 Structured data types

##### 6.2.6.2.1 Introduction

This clause defines the data structures to be used in resource representations.

##### 6.2.6.2.2 Type: RTUavStatusSubsc

Table 6.2.6.2.2-1: Definition of type RTUavStatusSubsc

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| uassId | Uri | M | 1 | Contains the identity of the UASS that is sending the request. It takes the form of a URI. |  |
| uavIds | array(UavId) | M | 1..N | Contains the identity of the UAV(s) to which the real-time UAV status subscription is related. |  |
| notificationUri | Uri | M | 1 | Contains the notification URI via which the UASS desires to receive real-time UAV status notifications from the UAE Server. |  |
| suppFeat | SupportedFeatures | C | 0..1 | Contains the list of supported features among the ones defined in clause 6.2.8.  This attribute shall be provided in the HTTP POST request for subscription resource creation and in the associated successful response. |  |

##### 6.2.6.2.3 Type: RTUavStatusNotif

Table 6.2.6.2.3-1: Definition of type RTUavStatusNotif

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| subscriptionId | string | M | 1 | Contains the identifier of the Individual Real-time UAV Status Subscription to which the notification is related. |  |
| rTUavStatus | array(RTUavStatus) | M | 1..N | Contains the real-time UAV status information for a UAV. |  |

##### 6.2.6.2.4 Type: RTUavStatus

Table 6.2.6.2.4-1: Definition of type RTUavStatus

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| uavId | UavId | M | 1 | Contains the identity of the UAV to which the real-time UAV status information is related. |  |
| uavNetConnStatus | UavNetConnStatus | C | 0..1 | Contains the network connection status information for the UAV.  (NOTE) |  |
| uavLocInfo | LocationInfo | M | 0..1 | Contains the location information for the UAV.  (NOTE) |  |
| NOTE: Either only the "uavLocInfo" attribute or both the "uavNetConnStatus" attribute and the "uavLocInfo" attribute shall be present. | | | | | |

##### 6.2.6.2.5 Type: UavNetConnStatus

Table 6.2.6.2.5-1: Definition of type UavNetConnStatus

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| statusInfo | MonitoringType | M | 1 | Contains the network connection status monitoring event that occurred.  Only the "LOSS\_OF\_CONNECTIVITY", "UE\_REACHABILITY", "COMMUNICATION\_FAILURE" and "PDN\_CONNECTIVITY\_STATUS" values are applicable. |  |
| timestamp | DateTime | M | 1 | Contains the timestamp of the provided network connection status information. |  |

#### 6.2.6.3 Simple data types and enumerations

##### 6.2.6.3.1 Introduction

This clause defines simple data types and enumerations that can be referenced from data structures defined in the previous clauses.

##### 6.2.6.3.2 Simple data types

The simple data types defined in table 6.2.6.3.2-1 shall be supported.

Table 6.2.6.3.2-1: Simple data types

|  |  |  |  |
| --- | --- | --- | --- |
| Type Name | Type Definition | Description | Applicability |
|  |  |  |  |

#### 6.2.6.4 Data types describing alternative data types or combinations of data types

There are no data types describing alternative data types or combinations of data types defined for this API in this release of the specification.

#### 6.2.6.5 Binary data

##### 6.2.6.5.1 Binary Data Types

Table 6.2.6.5.1-1: Binary Data Types

|  |  |  |
| --- | --- | --- |
| Name | Clause defined | Content type |
|  |  |  |

### 6.2.7 Error Handling

#### 6.2.7.1 General

For the UAE\_RealtimeUAVStatus API, HTTP error responses shall be supported as specified in clause 5.2.6 of 3GPP TS 29.122 [2]. Protocol errors and application errors specified in clause 5.2.6 of 3GPP TS 29.122 [2] shall be supported for the HTTP status codes specified in table 5.2.6-1 of 3GPP TS 29.122 [2].

In addition, the requirements in the following clauses are applicable for the UAE\_RealtimeUAVStatus API.

#### 6.2.7.2 Protocol Errors

No specific protocol errors for the UAE\_RealtimeUAVStatus API are specified.

#### 6.2.7.3 Application Errors

The application errors defined for the UAE\_RealtimeUAVStatus API are listed in Table 6.2.7.3-1.

Table 6.2.7.3-1: Application errors

|  |  |  |
| --- | --- | --- |
| Application Error | HTTP status code | Description |
|  |  |  |

### 6.2.8 Feature negotiation

The optional features listed in table 6.2.8-1 are defined for the UAE\_RealtimeUAVStatus API. They shall be negotiated using the extensibility mechanism defined in clause 5.2.7 of 3GPP TS 29.122 [2].

Table 6.2.8-1: Supported Features

|  |  |  |
| --- | --- | --- |
| Feature number | Feature Name | Description |
|  |  |  |

### 6.2.9 Security

The provisions of clause 6 of 3GPP TS 29.122 [2] shall apply for the UAE\_RealtimeUAVStatus API.

## 6.3 UAE\_ChangeUSSManagement Service API

### 6.3.1 Introduction

The UAE\_ChangeUSSManagement service shall use the UAE\_ChangeUSSManagement API.

The API URI of the UAE\_ChangeUSSManagement API shall be:

**{apiRoot}/<apiName>/<apiVersion>**

The request URIs used in HTTP requests shall have the Resource URI structure defined in clause 5.2.4 of 3GPP TS 29.122 [2], i.e.:

**{apiRoot}/<apiName>/<apiVersion>/<apiSpecificSuffixes>**

with the following components:

- The {apiRoot} shall be set as described in clause 5.2.4 of 3GPP TS 29.122 [2].

- The <apiName>shall be "uae-usschange-mngt".

- The <apiVersion> shall be "v1".

- The <apiSpecificSuffixes> shall be set as described in clause 5.2.4 of 3GPP TS 29.122 [2].

NOTE: When 3GPP TS 29.122 [2] is referenced for the common protocol and interface aspects for API definition in the clauses under clause 6.3, the UAE Server takes the role of the SCEF and the UASS takes the role of the SCS/AS.

### 6.3.2 Usage of HTTP

The provisions of clause 5.2.2 of 3GPP TS 29.122 [2] shall apply for the UAE\_ChangeUSSManagement API.

### 6.3.3 Resources

#### 6.3.3.1 Overview

This clause describes the structure for the Resource URIs and the resources and methods used for the service.

Figure 6.3.3.1-1 depicts the resource URIs structure for the UAE\_ChangeUSSManagement API.



Figure 6.3.3.1-1: Resource URIs structure of the UAE\_ChangeUSSManagement API

Table 6.3.3.1-1 provides an overview of the resources and applicable HTTP methods for the UAE\_ChangeUSSManagement API.

Table 6.3.3.1-1: Resources and methods overview

|  |  |  |  |
| --- | --- | --- | --- |
| Resource name | Resource URI | HTTP method or custom operation | Description |
| USS Change Policies | /policies | GET | Retrieve all the active USS Change Policies managed by the UAE Server. |
| POST | Request the creation of a USS Change Policy. |
| Individual USS Change Policy | /policies/{policyId} | GET | Retrieve an existing "Individual USS Change Policy". |
| PUT | Request the update of an existing "Individual USS Change Policy". |
| PATCH | Request the modification of an existing "Individual USS Change Policy". |
| DELETE | Request the deletion of an existing "Individual USS Change Policy". |

#### 6.3.3.2 Resource: USS Change Policies

##### 6.3.3.2.1 Description

This resource represents the collection of USS Change Policies managed by the UAE Server.

##### 6.3.3.2.2 Resource Definition

Resource URI: **{apiRoot}/uae-usschange-mngt/****<apiVersion>/policies**

This resource shall support the resource URI variables defined in table 6.3.3.2.2-1.

Table 6.3.3.2.2-1: Resource URI variables for this resource

|  |  |  |
| --- | --- | --- |
| Name | Data type | Definition |
| apiRoot | string | See clause 5.2.4 of 3GPP TS 29.122 [2]. |

##### 6.3.3.2.3 Resource Standard Methods

###### 6.3.3.2.3.1 GET

The HTTP GET method allows a UASS to retrieve all the active USS Change Policies managed by the UAE Server.

This method shall support the URI query parameters specified in table 6.3.3.2.3.1-1.

Table 6.3.3.2.3.1-1: URI query parameters supported by the GET method on this resource

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description | Applicability |
| n/a |  |  |  |  |  |

This method shall support the request data structures specified in table 6.3.3.2.3.1-2 and the response data structures and response codes specified in table 6.3.3.2.3.1-3.

Table 6.3.3.2.3.1-2: Data structures supported by the GET Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| n/a |  |  |  |

Table 6.3.3.2.3.1-3: Data structures supported by the GET Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response  codes | Description |
| array(USSChangePolicy) | M | 1..N | 200 OK | Successful case. All the active USS Change Policies managed by the UAE Server shall be returned. |
| n/a |  |  | 307 Temporary Redirect | Temporary redirection. The response shall include a Location header field containing an alternative URI of the resource located in an alternative UAE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| n/a |  |  | 308 Permanent Redirect | Permanent redirection. The response shall include a Location header field containing an alternative URI of the resource located in an alternative UAE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| NOTE: The mandatory HTTP error status code for the HTTP GET method listed in table 5.2.6-1 of 3GPP TS 29.122 [2] shall also apply. | | | | |

Table 6.3.3.2.3.1-4: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | An alternative URI of the resource located in an alternative UAE Server. |

Table 6.3.3.2.3.1-5: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | An alternative URI of the resource located in an alternative UAE Server. |

###### 6.3.3.2.3.2 POST

The HTTP POST method allows a UASS to request the creation of a USS Change Policy at the UAE Server.

This method shall support the URI query parameters specified in table 6.3.3.2.3.2-1.

Table 6.3.3.2.3.2-1: URI query parameters supported by the POST method on this resource

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description | Applicability |
| n/a |  |  |  |  |  |

This method shall support the request data structures specified in table 6.3.3.2.3.2-2 and the response data structures and response codes specified in table 6.3.3.2.3.2-3.

Table 6.3.3.2.3.2-2: Data structures supported by the POST Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| USSChangePolReq | M | 1 | Represents the parameters to request the creation of a USS Change Policy. |

Table 6.3.3.2.3.2-3: Data structures supported by the POST Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response  codes | Description |
| USSChangePolResp | M | 1 | 201 Created | Successful case. The USS Change Policy is successfully created and a representation of the created "Individual USS Change Policy" resource shall be returned.  An HTTP "Location" header that contains the resource URI of the created resource shall also be included. |
| NOTE: The mandatory HTTP error status code for the HTTP POST method listed in table 5.2.6-1 of 3GPP TS 29.122 [2] shall also apply. | | | | |

Table 6.3.3.2.3.2-4: Headers supported by the 201 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains the URI of the newly created resource, according to the structure:  {apiRoot}/uae-usschange-mngt/<apiVersion>/policies/{policyId} |

##### 6.3.3.2.4 Resource Custom Operations

There are no resource custom operations defined for this resource in this release of the specification.

#### 6.3.3.3 Resource: Individual USS Change Policy

##### 6.3.3.3.1 Description

This resource represents a USS Change Policy managed by the UAE Server.

##### 6.3.3.3.2 Resource Definition

Resource URI: **{apiRoot}/uae-usschange-mngt/<apiVersion>/policies/{policyId}**

This resource shall support the resource URI variables defined in table 6.3.3.3.2-1.

Table 6.3.3.3.2-1: Resource URI variables for this resource

|  |  |  |
| --- | --- | --- |
| Name | Data type | Definition |
| apiRoot | string | See clause 5.2.4 of 3GPP TS 29.122 [2]. |
| policyId | string | Represents the identifier of the "Individual USS Change Policy". |

##### 6.3.3.3.3 Resource Standard Methods

###### 6.3.3.3.3.1 GET

The HTTP GET method allows a UASS to retrieve an existing "Individual USS Change Policy" resource at the UAE Server.

This method shall support the URI query parameters specified in table 6.3.3.3.3.1-1.

Table 6.3.3.3.3.1-1: URI query parameters supported by the GET method on this resource

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description | Applicability |
| n/a |  |  |  |  |  |

This method shall support the request data structures specified in table 6.3.3.3.3.1-2 and the response data structures and response codes specified in table 6.3.3.3.3.1-3.

Table 6.3.3.3.3.1-2: Data structures supported by the GET Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| n/a |  |  |  |

Table 6.3.3.3.3.1-3: Data structures supported by the GET Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response  codes | Description |
| USSChangePolicy | M | 1 | 200 OK | Successful case. The requested "Individual USS Change Policy" resource shall be returned. |
| n/a |  |  | 307 Temporary Redirect | Temporary redirection. The response shall include a Location header field containing an alternative URI of the resource located in an alternative UAE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| n/a |  |  | 308 Permanent Redirect | Permanent redirection. The response shall include a Location header field containing an alternative URI of the resource located in an alternative UAE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| NOTE: The mandatory HTTP error status code for the HTTP GET method listed in table 5.2.6-1 of 3GPP TS 29.122 [2] shall also apply. | | | | |

Table 6.3.3.3.3.1-4: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | An alternative URI of the resource located in an alternative UAE Server. |

Table 6.3.3.3.3.1-5: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | An alternative URI of the resource located in an alternative UAE Server. |

###### 6.3.3.3.3.2 PUT

The HTTP PUT method allows a UASS to request the update of an existing "Individual USS Change Policy" resource at the UAE Server.

This method shall support the URI query parameters specified in table 6.3.3.3.3.2-1.

Table 6.3.3.3.3.2-1: URI query parameters supported by the PUT method on this resource

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description | Applicability |
| n/a |  |  |  |  |  |

This method shall support the request data structures specified in table 6.3.3.3.3.2-2 and the response data structures and response codes specified in table 6.3.3.3.3.2-3.

Table 6.3.3.3.3.2-2: Data structures supported by the PUT Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| USSChangePolicy | M | 1 | Represents the updated representation of the "Individual USS Change Policy" resource. |

Table 6.3.3.3.3.2-3: Data structures supported by the PUT Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response  codes | Description |
| USSChangePolicy | M | 1 | 200 OK | Successful case. The "Individual USS Change Policy" resource is successfully updated and a representation of the updated resource shall be returned in the response body. |
| n/a |  |  | 204 No Content | Successful case. The "Individual USS Change Policy" resource is successfully updated and no content is returned in the response body. |
| n/a |  |  | 307 Temporary Redirect | Temporary redirection. The response shall include a Location header field containing an alternative URI of the resource located in an alternative UAE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| n/a |  |  | 308 Permanent Redirect | Permanent redirection. The response shall include a Location header field containing an alternative URI of the resource located in an alternative UAE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| NOTE: The mandatory HTTP error status code for the HTTP PUT method listed in table 5.2.6-1 of 3GPP TS 29.122 [2] shall also apply. | | | | |

Table 6.3.3.3.3.2-4: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | An alternative URI of the resource located in an alternative UAE Server. |

Table 6.3.3.3.3.2-5: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | An alternative URI of the resource located in an alternative UAE Server. |

###### 6.3.3.3.3.2 PATCH

The HTTP PATCH method allows a UASS to request the modification of an existing "Individual USS Change Policy" resource at the UAE Server.

This method shall support the URI query parameters specified in table 6.3.3.3.3.2-1.

Table 6.3.3.3.3.2-1: URI query parameters supported by the PATCH method on this resource

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description | Applicability |
| n/a |  |  |  |  |  |

This method shall support the request data structures specified in table 6.3.3.3.3.2-2 and the response data structures and response codes specified in table 6.3.3.3.3.2-3.

Table 6.3.3.3.3.2-2: Data structures supported by the PATCH Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| USSChangePolicyPatch | M | 1 | Represents the parameters to request the modification of the "Individual USS Change Policy" resource. |

Table 6.3.3.3.3.2-3: Data structures supported by the PATCH Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response  codes | Description |
| USSChangePolicy | M | 1 | 200 OK | Successful case. The "Individual USS Change Policy" resource is successfully modified and a representation of the updated resource shall be returned in the response body. |
| n/a |  |  | 204 No Content | Successful case. The "Individual USS Change Policy" resource is successfully modified and no content is returned in the response body. |
| n/a |  |  | 307 Temporary Redirect | Temporary redirection. The response shall include a Location header field containing an alternative URI of the resource located in an alternative UAE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| n/a |  |  | 308 Permanent Redirect | Permanent redirection. The response shall include a Location header field containing an alternative URI of the resource located in an alternative UAE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| NOTE: The mandatory HTTP error status code for the HTTP PATCH method listed in table 5.2.6-1 of 3GPP TS 29.122 [2] shall also apply. | | | | |

Table 6.3.3.3.3.2-4: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | An alternative URI of the resource located in an alternative UAE Server. |

Table 6.3.3.3.3.2-5: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | An alternative URI of the resource located in an alternative UAE Server. |

###### 6.3.3.3.3.4 DELETE

The HTTP DELETE method allows a UASS to request the deletion of an existing "Individual USS Change Policy" resource at the UAE Server.

This method shall support the URI query parameters specified in table 6.3.3.3.3.4-1.

Table 6.3.3.3.3.4-1: URI query parameters supported by the DELETE method on this resource

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description | Applicability |
| n/a |  |  |  |  |  |

This method shall support the request data structures specified in table 6.3.3.3.3.4-2 and the response data structures and response codes specified in table 6.3.3.3.3.4-3.

Table 6.3.3.3.3.4-2: Data structures supported by the DELETE Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| n/a |  |  |  |

Table 6.3.3.3.3.4-3: Data structures supported by the DELETE Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response  codes | Description |
| n/a |  |  | 204 No Content | Successful case. The "Individual USS Change Policy" resource is successfully deleted. |
| n/a |  |  | 307 Temporary Redirect | Temporary redirection. The response shall include a Location header field containing an alternative URI of the resource located in an alternative UAE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| n/a |  |  | 308 Permanent Redirect | Permanent redirection. The response shall include a Location header field containing an alternative URI of the resource located in an alternative UAE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| NOTE: The mandatory HTTP error status code for the HTTP DELETE method listed in table 5.2.6-1 of 3GPP TS 29.122 [2] shall also apply. | | | | |

Table 6.3.3.3.3.4-4: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | An alternative URI of the resource located in an alternative UAE Server. |

Table 6.3.3.3.3.4-5: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | An alternative URI of the resource located in an alternative UAE Server. |

##### 6.3.3.3.4 Resource Custom Operations

There are no resource custom operations defined for this resource in this release of the specification.

### 6.3.4 Custom Operations without associated resources

#### 6.3.4.1 Overview

The structure of the custom operation URIs of the UAE\_ChangeUSSManagement API is shown in Figure 6.3.4.1-1.



Figure 6.3.4.1-1: Custom operation URI structure of the UAE\_ChangeUSSManagement API

Table 6.3.4.1-1 provides an overview of the custom operations and applicable HTTP methods defined for the UAE\_ChangeUSSManagement API.

Table 6.3.4.1-1: Custom operations without associated resources

|  |  |  |  |
| --- | --- | --- | --- |
| Operation name | Custom operation URI | Mapped HTTP method | Description |
| RequestUssChange | /request-usschange | POST | Enables a UASS to request USS change to the UAE Server. |

#### 6.3.4.2 Operation: RequestUssChange

##### 6.3.4.2.1 Description

The custom operation enables a UASS to request USS change to the UAE Server.

##### 6.3.4.2.2 Operation Definition

This operation shall support the request data structures and the response data structures and response codes specified in tables 6.3.4.2.2-1 and 6.3.4.2.2-2.

Table 6.3.4.2.2-1: Data structures supported by the POST Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| USSChangeReq | M | 1 | Contains the parameters to request USS change. |

Table 6.3.4.2.2-2: Data structures supported by the POST Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response  codes | Description |
| n/a |  |  | 204 No Content | Successful case. The USS change request is successfully received. |
| n/a |  |  | 307 Temporary Redirect | Temporary redirection. The response shall include a Location header field containing an alternative target URI located in an alternative UAE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| n/a |  |  | 308 Permanent Redirect | Permanent redirection. The response shall include a Location header field containing an alternative target URI located in an alternative UAE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2] |
| NOTE: The mandatory HTTP error status code for the HTTP POST method listed in table 5.2.6-1 of 3GPP TS 29.122 [2] shall also apply. | | | | |

Table 6.3.4.2.2-3: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | An alternative target URI located in an alternative UAE Server. |

Table 6.3.4.2.2-4: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | An alternative target URI located in an alternative UAE Server. |

### 6.3.5 Notifications

#### 6.3.5.1 General

Notifications shall comply to clause 5.2.5 of 3GPP TS 29.122 [2].

Table 6.3.5.1-1: Notifications overview

|  |  |  |  |
| --- | --- | --- | --- |
| Notification | Callback URI | HTTP method or custom operation | Description  (service operation) |
| USS Change Policy Configuration Status Notification | {notifUri}/usschange-policy | usschange-policy (POST) | This service operation enables a UAE Server to notify a previously subscribed UASS on the status of USS Change Policy configuration. |
| USS Change Notification | {notifUri}/usschange | usschange (POST) | This service operation enables a UAE Server to notify a previously subscribed UASS that a USS change was performed. |
| USS Change Trigger Notification | {notifUri}/usschange-trigger | usschange-trigger (POST) | This service operation enables a UAE Server to notify a previously subscribed UASS that a USS change should be triggered. |

#### 6.3.5.2 USS Change Policy Configuration Status Notification

##### 6.3.5.2.1 Description

The USS Change Policy Configuration Status Notification is used by a UAE Server to notify a previously subscribed UASS on the status of USS Change Policy configuration status.

##### 6.3.5.2.2 Target URI

The Callback URI **"{notifUri}**/**usschange-policy"** shall be used with the callback URI variables defined in table 6.3.5.2.2-1.

Table 6.3.5.2.2-1: Callback URI variables

|  |  |  |
| --- | --- | --- |
| Name | Data type | Definition |
| notifUri | Uri | String formatted as a URI containing the Callback URI.  The notification URI is provided as part of the USS Change Policy creation/update/modification request as defined in clause 6.3.3. |

##### 6.3.5.2.3 Standard Methods

###### 6.3.5.2.3.1 POST

This method shall support the request data structures specified in table 6.3.5.2.3.1-1 and the response data structures and response codes specified in table 6.3.5.2.3.1-2.

Table 6.3.5.2.3.1-1: Data structures supported by the POST Request Body

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| USSChangePolConfigNotif | M | 1 | Represents a USS Change Policy Configuration Status notification. |

Table 6.3.5.2.3.1-2: Data structures supported by the POST Response Body

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response codes | Description |
| n/a |  |  | 204 No Content | Successful case. The USS Change Policy Configuration Status notification is successfully received and acknowledged. |
| n/a |  |  | 307 Temporary Redirect | Temporary redirection. The response shall include a Location header field containing an alternative URI representing the end point of an alternative UASS where the notification should be sent.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| n/a |  |  | 308 Permanent Redirect | Permanent redirection. The response shall include a Location header field containing an alternative URI representing the end point of an alternative UASS where the notification should be sent.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| NOTE: The mandatory HTTP error status codes for the HTTP POST method listed in table 5.2.6-1 of 3GPP TS 29.122 [2] shall also apply. | | | | |

Table 6.3.5.2.3.1-3: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | An alternative URI representing the end point of an alternative UASS towards which the notification should be redirected. |

Table 6.3.5.2.3.1-4: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | An alternative URI representing the end point of an alternative UASS towards which the notification should be redirected. |

#### 6.3.5.3 USS Change Notification

##### 6.3.5.3.1 Description

The USS Change Notification is used by a UAE Server to notify a previously subscribed UASS that a USS change was performed.

##### 6.3.5.3.2 Target URI

The Callback URI **"{notifUri}**/**usschange"** shall be used with the callback URI variables defined in table 6.3.5.3.2-1.

Table 6.3.5.3.2-1: Callback URI variables

|  |  |  |
| --- | --- | --- |
| Name | Data type | Definition |
| notifUri | Uri | String formatted as a URI containing the Callback URI.  The notification URI is provided as part of the USS Change Policy creation/update/modification request as defined in clause 6.3.3. |

##### 6.3.5.3.3 Standard Methods

###### 6.3.5.3.3.1 POST

This method shall support the request data structures specified in table 6.3.5.3.3.1-1 and the response data structures and response codes specified in table 6.3.5.3.3.1-2.

Table 6.3.5.3.3.1-1: Data structures supported by the POST Request Body

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| USSChangeNotif | M | 1 | Represents a USS Change notification. |

Table 6.3.5.3.3.1-2: Data structures supported by the POST Response Body

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response codes | Description |
| n/a |  |  | 204 No Content | Successful case. The USS Change notification is successfully received and acknowledged. |
| n/a |  |  | 307 Temporary Redirect | Temporary redirection. The response shall include a Location header field containing an alternative URI representing the end point of an alternative UASS where the notification should be sent.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| n/a |  |  | 308 Permanent Redirect | Permanent redirection. The response shall include a Location header field containing an alternative URI representing the end point of an alternative UASS where the notification should be sent.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| NOTE: The mandatory HTTP error status codes for the HTTP POST method listed in table 5.2.6-1 of 3GPP TS 29.122 [2] shall also apply. | | | | |

Table 6.3.5.3.3.1-3: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | An alternative URI representing the end point of an alternative UASS towards which the notification should be redirected. |

Table 6.3.5.3.3.1-4: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | An alternative URI representing the end point of an alternative UASS towards which the notification should be redirected. |

#### 6.3.5.4 USS Change Trigger Notification

##### 6.3.5.4.1 Description

The USS Change Trigger Notification is used by a UAE Server to notify a previously subscribed UASS that a USS change should be triggered.

##### 6.3.5.4.2 Target URI

The Callback URI **"{notifUri}**/**usschange-trigger"** shall be used with the callback URI variables defined in table 6.3.5.4.2-1.

Table 6.3.5.4.2-1: Callback URI variables

|  |  |  |
| --- | --- | --- |
| Name | Data type | Definition |
| notifUri | Uri | String formatted as a URI containing the Callback URI.  The notification URI is provided as part of the USS Change Policy creation/update/modification request as defined in clause 6.3.3. |

##### 6.3.5.4.3 Standard Methods

###### 6.3.5.4.3.1 POST

This method shall support the request data structures specified in table 6.3.5.4.3.1-1 and the response data structures and response codes specified in table 6.3.5.4.3.1-2.

Table 6.3.5.4.3.1-1: Data structures supported by the POST Request Body

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| USSChangeTriggerNotif | M | 1 | Represents a USS Change Trigger notification. |

Table 6.3.5.4.3.1-2: Data structures supported by the POST Response Body

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response codes | Description |
| n/a |  |  | 204 No Content | Successful case. The USS Change Trigger notification is successfully received and acknowledged. |
| n/a |  |  | 307 Temporary Redirect | Temporary redirection. The response shall include a Location header field containing an alternative URI representing the end point of an alternative UASS where the notification should be sent.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| n/a |  |  | 308 Permanent Redirect | Permanent redirection. The response shall include a Location header field containing an alternative URI representing the end point of an alternative UASS where the notification should be sent.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| NOTE: The mandatory HTTP error status codes for the HTTP POST method listed in table 5.2.6-1 of 3GPP TS 29.122 [2] shall also apply. | | | | |

Table 6.3.5.4.3.1-3: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | An alternative URI representing the end point of an alternative UASS towards which the notification should be redirected. |

Table 6.3.5.4.3.1-4: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | An alternative URI representing the end point of an alternative UASS towards which the notification should be redirected. |

### 6.3.6 Data Model

#### 6.3.6.1 General

This clause specifies the application data model supported by the API.

Table 6.3.6.1-1 specifies the data types defined for the UAE\_ChangeUSSManagement API.

Table 6.3.6.1-1: UAE\_ChangeUSSManagement API specific Data Types

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | Clause defined | Description | Applicability |
| MultiUssPol | 6.3.6.2.6 | Represents a Multi-USS policy. |  |
| UasServArea | 6.3.6.2.7 | Represents a service area (e.g. registration service area) for a UAS. |  |
| UasRoute | 6.3.6.2.8 | Represents the a UAS route. |  |
| USSChangeNotif | 6.3.6.2.11 | Represents a USS Change notification. |  |
| USSChangePolConfigNotif | 6.3.6.2.10 | Represents a USS Change Policy Configuration Status notification. |  |
| USSChangePolReq | 6.3.6.2.2 | Represents the parameters to request the creation of a USS Change Policy. |  |
| USSChangePolResp | 6.3.6.2.3 | Represents the response to a USS Change Policy create request. |  |
| USSChangePolicy | 6.3.6.2.4 | Represents a USS Change Policy. |  |
| USSChangePolicyPatch | 6.3.6.2.5 | Represents the parameters to request the modification of a USS Change Policy. |  |
| USSChangeReq | 6.3.6.2.9 | Represents the parameters to request for USS change. |  |
| USSChangeTriggerNotif | 6.3.6.2.12 | Represents a USS Change Trigger notification. |  |

Table 6.3.6.1-2 specifies data types re-used by the UAE\_ChangeUSSManagement API from other specifications, including a reference to their respective specifications, and when needed, a short description of their use within the UAE\_ChangeUSSManagement API.

Table 6.3.6.1-2: UAE\_ChangeUSSManagement API re-used Data Types

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | Reference | Comments | Applicability |
| GeographicArea | 3GPP TS 29.572 [8] | Represents a geographical area. |  |
| Ncgi | 3GPP TS 29.571 [7] | Represents an NCGI. |  |
| SupportedFeatures | 3GPP TS 29.571 [7] | Used to negotiate the applicability of the optional features. |  |
| Tai | 3GPP TS 29.571 [7] | Represents a tracking area identifier. |  |
| UasId | Clause 6.1.6.2.6 | Represents a UAV identifier. |  |
| Uri | 3GPP TS 29.122 [2] | Represents a URI. |  |

#### 6.3.6.2 Structured data types

##### 6.3.6.2.1 Introduction

This clause defines the data structures to be used in resource representations.

##### 6.3.6.2.2 Type: USSChangePolReq

Table 6.3.6.2.2-1: Definition of type USSChangePolReq

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| uassId | Uri | M | 1 | Contains the identity of the UASS that is sending the request. |  |
| ussChangePol | USSChangePoloicy | M | 1 | Contains the USS Change Policy that shall be created. |  |
| suppFeat | SupportedFeatures | C | 0..1 | Contains the list of supported features among the ones defined in clause 6.3.8.  This attribute shall be provided if feature negotiation shall take place. |  |

##### 6.3.6.2.3 Type: USSChangePolResp

Table 6.3.6.2.3-1: Definition of type USSChangePolResp

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| ussChangePol | USSChangePoloicy | M | 1 | Contains the created USS Change Policy. |  |
| suppFeat | SupportedFeatures | C | 0..1 | Contains the list of supported features among the ones defined in clause 6.3.8.  This attribute shall be provided if feature negotiation shall take place and this attribute was present in the corresponding request. |  |

##### 6.3.6.2.4 Type: USSChangePolicy

Table 6.3.6.2.4-1: Definition of type USSChangePolicy

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| uasId | UasId | M | 1 | Contains the identifier of the UAS (i.e. pair of UAV and UAV-C) to which the provided USS Change Policy is related.  This shall be either in form of a UAS identifier (e.g. group ID) or a collection of individual identifiers (e.g. CAA level UAV ID, GPSI) of the UAV and UAV-C composing the UAS. |  |
| notifUri | Uri | M | 1 | Contains the notification URI via which the UASS desires to receive USS Change management related notifications from the UAE Server. |  |
| uasRegArea | UasServArea | O | 0..1 | Contains the registration area within which the UAS is allowed to fly. |  |
| uasAllowedRoute | UasRoute | O | 0..1 | Contains the allowed route for the UAS within the UAS registration area provided by the "uasRegArea" attribute.  This attribute shall be present only if the "uasRegArea" attribute is present. |  |
| multiUssPol | MultiUssPol | O | 0..1 | Contains the multi-USS policy management container consisting of the requirements and policies for multi-USS management. |  |

Editor's Note: The full content of the USSChangePolicy data structure is FFS.

##### 6.3.6.2.5 Type: USSChangePolicyPatch

Table 6.3.6.2.5-1: Definition of type USSChangePolicyPatch

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| notifUri | Uri | O | 0..1 | Contains the updated notification URI via which the UASS desires to receive USS Change management related notifications from the UAE Server. |  |
| uasRegArea | UasServArea | O | 0..1 | Contains the updated registration area within which the UAS is allowed to fly. |  |
| uasAllowedRoute | UasRoute | O | 0..1 | Contains the updated allowed route for the UAS within the UAS registration area provided by the "uasRegArea" attribute.  This attribute shall be present only if the "uasRegArea" attribute is present. |  |
| multiUssPol | MultiUssPol | O | 0..1 | Contains the updated multi-USS policy management container. |  |

Editor's Note: The full content of the USSChangePolicyPatch data structure is FFS.

##### 6.3.6.2.6 Type: MultiUssPol

Table 6.3.6.2.6-1: Definition of type MultiUssPol

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
|  |  |  | 1 |  |  |

Editor's Note: The definition of the MultiUssPol data structure is FFS.

##### 6.3.6.2.7 Type: UasServArea

Table 6.3.6.2.7-1: Definition of type UasServArea

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| ncgiList | array(Ncgi) | C | 1..N | Contains a list of NR cell identifier(s) that constitutes the service area. |  |
| taiList | array(Tai) | C | 1..N | Contains a list of tracking area identifier(s) that constitutes the service area. |  |
| geographicAreaList | array(GeographicArea) | C | 1..N | Contains a list of geographic area(s) that constitutes the service area. |  |
| NOTE: Either the "geographicAreaList" attribute, or the "ncgiList" attribute and/or the "taiList" attribute shall be provided. | | | | | |

Editor's Note: The content of the UasServArea data structure is FFS.

##### 6.3.6.2.8 Type: UasRoute

Table 6.3.6.2.8-1: Definition of type UasRoute

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
|  |  |  | 1 |  |  |

Editor's Note: The definition of the UasRoute data structure is FFS.

##### 6.3.6.2.9 Type: USSChangeReq

Table 6.3.6.2.9-1: Definition of type USSChangeReq

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| uassId | Uri | M | 1 | Contains the identity of the UASS that is sending the request. |  |
| uasId | UasId | M | 1 | Contains the identifier of the UAS (i.e. pair of UAV and UAV-C) to which the USS change request is related.  This shall be either in form of a UAS identifier (e.g. group ID) or a collection of individual identifiers (e.g. CAA level UAV ID, GPSI) of the UAV and UAV-C composing the UAS. |  |
| suppFeat | SupportedFeatures | C | 0..1 | Contains the list of supported features among the ones defined in clause 6.3.8.  This attribute shall be provided if feature negotiation shall take place. |  |

Editor's Note: The full content of the USSChangeReq data structure is FFS.

##### 6.3.6.2.10 Type: USSChangePolConfigNotif

Table 6.3.6.2.10-1: Definition of type USSChangePolConfigNotif

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| uasId | UasId | M | 1 | Contains the identifier of the UAS (i.e. pair of UAV and UAV-C) to which the USS Change Policy configuration notification is related.  This shall be either in form of a UAS identifier (e.g. group ID) or a collection of individual identifiers (e.g. CAA level UAV ID, GPSI) of the UAV and UAV-C composing the UAS. |  |
| multiUssPol | MultiUssPol | O | 0..1 | Contains the multi-USS policy management container consisting of the requirements and policies for multi-USS management. |  |

Editor's Note: The full content of the USSChangePolConfigNotif data structure is FFS.

##### 6.3.6.2.11 Type: USSChangeNotif

Table 6.3.6.2.11-1: Definition of type USSChangeNotif

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
|  |  |  |  |  |  |

Editor's Note: The definition of the USSChangeNotif data structure is FFS.

##### 6.3.6.2.12 Type: USSChangeTriggerNotif

Table 6.3.6.2.12-1: Definition of type USSChangeTriggerNotif

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
|  |  |  |  |  |  |

Editor's Note: The definition of the USSChangeTriggerNotif data structure is FFS.

#### 6.3.6.3 Simple data types and enumerations

##### 6.3.6.3.1 Introduction

This clause defines simple data types and enumerations that can be referenced from data structures defined in the previous clauses.

##### 6.3.6.3.2 Simple data types

The simple data types defined in table 6.3.6.3.2-1 shall be supported.

Table 6.3.6.3.2-1: Simple data types

|  |  |  |  |
| --- | --- | --- | --- |
| Type Name | Type Definition | Description | Applicability |
|  |  |  |  |

#### 6.3.6.4 Data types describing alternative data types or combinations of data types

There are no data types describing alternative data types or combinations of data types defined for this API in this release of the specification.

#### 6.3.6.5 Binary data

##### 6.3.6.5.1 Binary Data Types

Table 6.3.6.5.1-1: Binary Data Types

|  |  |  |
| --- | --- | --- |
| Name | Clause defined | Content type |
|  |  |  |

### 6.3.7 Error Handling

#### 6.3.7.1 General

For the UAE\_ChangeUSSManagement API, HTTP error responses shall be supported as specified in clause 5.2.6 of 3GPP TS 29.122 [2]. Protocol errors and application errors specified in clause 5.2.6 of 3GPP TS 29.122 [2] shall be supported for the HTTP status codes specified in table 5.2.6-1 of 3GPP TS 29.122 [2].

In addition, the requirements in the following clauses are applicable for the UAE\_ChangeUSSManagement API.

#### 6.3.7.2 Protocol Errors

No specific protocol errors for the UAE\_ChangeUSSManagement API are specified.

#### 6.3.7.3 Application Errors

The application errors defined for the UAE\_ChangeUSSManagement API are listed in Table 6.3.7.3-1.

Table 6.3.7.3-1: Application errors

|  |  |  |
| --- | --- | --- |
| Application Error | HTTP status code | Description |
|  |  |  |

### 6.3.8 Feature negotiation

The optional features listed in table 6.3.8-1 are defined for the UAE\_ChangeUSSManagement API. They shall be negotiated using the extensibility mechanism defined in clause 5.2.7 of 3GPP TS 29.122 [2].

Table 6.3.8-1: Supported Features

|  |  |  |
| --- | --- | --- |
| Feature number | Feature Name | Description |
|  |  |  |

### 6.3.9 Security

The provisions of clause 6 of 3GPP TS 29.122 [2] shall apply for the UAE\_ChangeUSSManagement API.

## 6.4 UAE\_DAASupport Service API

### 6.4.1 Introduction

The UAE\_DAASupport service shall use the UAE\_DAASupport API.

The API URI of the UAE\_DAASupport Service API shall be:

**{apiRoot}/<apiName>/<apiVersion>**

The request URIs used in HTTP requests shall have the Resource URI structure defined in clause 5.2.4 of 3GPP TS 29.122 [2], i.e.:

**{apiRoot}/<apiName>/<apiVersion>/<apiSpecificSuffixes>**

with the following components:

- The {apiRoot} shall be set as described in clause 5.2.4 of 3GPP TS 29.122 [2].

- The <apiName>shall be "uae-daa".

- The <apiVersion> shall be "v1".

- The <apiSpecificSuffixes> shall be set as described in clause 5.2.4 of 3GPP TS 29.122 [2].

NOTE: When 3GPP TS 29.122 [2] is referenced for the common protocol and interface aspects for API definition in the clauses under clause 6.4, the UAE Server takes the role of the SCEF and the UASS takes the role of the SCS/AS.

### 6.4.2 Usage of HTTP

The provisions of clause 5.2.2 of 3GPP TS 29.122 [2] shall apply for the UAE\_DAASupport API.

### 6.4.3 Resources

#### 6.4.3.1 Overview

This clause describes the structure for the Resource URIs and the resources and methods used for the service.

Figure 6.4.3.1-1 depicts the resource URIs structure for the UAE\_DAASupport API.



Figure 6.4.3.1-1: Resource URIs structure of the UAE\_DAASupport API

Table 6.4.3.1-1 provides an overview of the resources and applicable HTTP methods for the UAE\_DAASupport API.

Table 6.4.3.1-1: Resources and methods overview

|  |  |  |  |
| --- | --- | --- | --- |
| Resource name | Resource URI | HTTP method or custom operation | Description |
| DAA Policies | /policies | GET | Retrieve all the active DAA Policies managed by the UAE Server. |
| POST | Request the creation of a DAA Policy. |
| Individual DAA Policy | /policies/{policyId} | GET | Retrieve an existing "Individual DAA Policy". |
| PUT | Request the update of an existing "Individual DAA Policy". |
| PATCH | Request the modification of an existing "Individual DAA Policy". |
| DELETE | Request the deletion of an existing "Individual DAA Policy". |

#### 6.4.3.2 Resource: DAA Policies

##### 6.4.3.2.1 Description

This resource represents the collection of DAA Policies managed by the UAE Server.

##### 6.4.3.2.2 Resource Definition

Resource URI: **{apiRoot}/uae-daa/<apiVersion>/policies**

This resource shall support the resource URI variables defined in table 6.4.3.2.2-1.

Table 6.4.3.2.2-1: Resource URI variables for this resource

|  |  |  |
| --- | --- | --- |
| Name | Data type | Definition |
| apiRoot | string | See clause 5.2.4 of 3GPP TS 29.122 [2]. |

##### 6.4.3.2.3 Resource Standard Methods

###### 6.4.3.2.3.1 GET

The HTTP GET method allows a UASS to retrieve all the active DAA Policies managed by the UAE Server.

This method shall support the URI query parameters specified in table 6.4.3.2.3.1-1.

Table 6.4.3.2.3.1-1: URI query parameters supported by the GET method on this resource

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description | Applicability |
| n/a |  |  |  |  |  |

This method shall support the request data structures specified in table 6.4.3.2.3.1-2 and the response data structures and response codes specified in table 6.4.3.2.3.1-3.

Table 6.4.3.2.3.1-2: Data structures supported by the GET Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| n/a |  |  |  |

Table 6.4.3.2.3.1-3: Data structures supported by the GET Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response  codes | Description |
| array(DAAPolicy) | M | 1..N | 200 OK | Successful case. All the active DAA Policies managed by the UAE Server shall be returned. |
| n/a |  |  | 307 Temporary Redirect | Temporary redirection. The response shall include a Location header field containing an alternative URI of the resource located in an alternative UAE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| n/a |  |  | 308 Permanent Redirect | Permanent redirection. The response shall include a Location header field containing an alternative URI of the resource located in an alternative UAE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| NOTE: The mandatory HTTP error status code for the HTTP GET method listed in table 5.2.6-1 of 3GPP TS 29.122 [2] shall also apply. | | | | |

Table 6.4.3.2.3.1-4: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | An alternative URI of the resource located in an alternative UAE Server. |

Table 6.4.3.2.3.1-5: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | An alternative URI of the resource located in an alternative UAE Server. |

###### 6.4.3.2.3.2 POST

The HTTP POST method allows a UASS to request the creation of a DAA Policy at the UAE Server.

This method shall support the URI query parameters specified in table 6.4.3.2.3.2-1.

Table 6.4.3.2.3.2-1: URI query parameters supported by the POST method on this resource

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description | Applicability |
| n/a |  |  |  |  |  |

This method shall support the request data structures specified in table 6.4.3.2.3.2-2 and the response data structures and response codes specified in table 6.4.3.2.3.2-3.

Table 6.4.3.2.3.2-2: Data structures supported by the POST Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| DAAPolReq | M | 1 | Represents the parameters to request the creation of a DAA Policy. |

Table 6.4.3.2.3.2-3: Data structures supported by the POST Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response  codes | Description |
| DAAPolResp | M | 1 | 201 Created | Successful case. The DAA Policy is successfully created and a representation of the created "Individual DAA Policy" resource shall be returned.  An HTTP "Location" header that contains the resource URI of the created resource shall also be included. |
| NOTE: The mandatory HTTP error status code for the HTTP POST method listed in table 5.2.6-1 of 3GPP TS 29.122 [2] shall also apply. | | | | |

Table 6.4.3.2.3.2-4: Headers supported by the 201 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains the URI of the newly created resource, according to the structure:  {apiRoot}/uae-daa/<apiVersion>/policies/{policyId} |

##### 6.4.3.2.4 Resource Custom Operations

There are no resource custom operations defined for this resource in this release of the specification.

#### 6.4.3.3 Resource: Individual DAA Policy

##### 6.4.3.3.1 Description

This resource represents a DAA Policy managed by the UAE Server.

##### 6.4.3.3.2 Resource Definition

Resource URI: **{apiRoot}/uae-daa/<apiVersion>/policies/{policyId}**

This resource shall support the resource URI variables defined in table 6.4.3.3.2-1.

Table 6.4.3.3.2-1: Resource URI variables for this resource

|  |  |  |
| --- | --- | --- |
| Name | Data type | Definition |
| apiRoot | string | See clause 5.2.4 of 3GPP TS 29.122 [2]. |
| policyId | string | Represents the identifier of the "Individual DAA Policy" resource. |

##### 6.4.3.3.3 Resource Standard Methods

###### 6.4.3.3.3.1 GET

The HTTP GET method allows a UASS to retrieve an existing "Individual DAA Policy" resource at the UAE Server.

This method shall support the URI query parameters specified in table 6.4.3.3.3.1-1.

Table 6.4.3.3.3.1-1: URI query parameters supported by the GET method on this resource

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description | Applicability |
| n/a |  |  |  |  |  |

This method shall support the request data structures specified in table 6.4.3.3.3.1-2 and the response data structures and response codes specified in table 6.4.3.3.3.1-3.

Table 6.4.3.3.3.1-2: Data structures supported by the GET Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| n/a |  |  |  |

Table 6.4.3.3.3.1-3: Data structures supported by the GET Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response  codes | Description |
| DAAPolicy | M | 1 | 200 OK | Successful case. The requested "Individual DAA Policy" resource shall be returned. |
| n/a |  |  | 307 Temporary Redirect | Temporary redirection. The response shall include a Location header field containing an alternative URI of the resource located in an alternative UAE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| n/a |  |  | 308 Permanent Redirect | Permanent redirection. The response shall include a Location header field containing an alternative URI of the resource located in an alternative UAE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| NOTE: The mandatory HTTP error status code for the HTTP GET method listed in table 5.2.6-1 of 3GPP TS 29.122 [2] shall also apply. | | | | |

Table 6.4.3.3.3.1-4: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | An alternative URI of the resource located in an alternative UAE Server. |

Table 6.4.3.3.3.1-5: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | An alternative URI of the resource located in an alternative UAE Server. |

###### 6.4.3.3.3.2 PUT

The HTTP PUT method allows a UASS to request the update of an existing "Individual DAA Policy" resource at the UAE Server.

This method shall support the URI query parameters specified in table 6.4.3.3.3.2-1.

Table 6.4.3.3.3.2-1: URI query parameters supported by the PUT method on this resource

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description | Applicability |
| n/a |  |  |  |  |  |

This method shall support the request data structures specified in table 6.4.3.3.3.2-2 and the response data structures and response codes specified in table 6.4.3.3.3.2-3.

Table 6.4.3.3.3.2-2: Data structures supported by the PUT Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| DAAPolicy | M | 1 | Represents the updated representation of the "Individual DAA Policy" resource. |

Table 6.4.3.3.3.2-3: Data structures supported by the PUT Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response  codes | Description |
| DAAPolicy | M | 1 | 200 OK | Successful case. The "Individual DAA Policy" resource is successfully updated and a representation of the updated resource shall be returned in the response body. |
| n/a |  |  | 204 No Content | Successful case. The "Individual DAA Policy" resource is successfully updated and no content is returned in the response body. |
| n/a |  |  | 307 Temporary Redirect | Temporary redirection. The response shall include a Location header field containing an alternative URI of the resource located in an alternative UAE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| n/a |  |  | 308 Permanent Redirect | Permanent redirection. The response shall include a Location header field containing an alternative URI of the resource located in an alternative UAE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| NOTE: The mandatory HTTP error status code for the HTTP PUT method listed in table 5.2.6-1 of 3GPP TS 29.122 [2] shall also apply. | | | | |

Table 6.4.3.3.3.2-4: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | An alternative URI of the resource located in an alternative UAE Server. |

Table 6.4.3.3.3.2-5: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | An alternative URI of the resource located in an alternative UAE Server. |

###### 6.4.3.3.3.2 PATCH

The HTTP PATCH method allows a UASS to request the modification of an existing "Individual DAA Policy" resource at the UAE Server.

This method shall support the URI query parameters specified in table 6.4.3.3.3.2-1.

Table 6.4.3.3.3.2-1: URI query parameters supported by the PATCH method on this resource

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description | Applicability |
| n/a |  |  |  |  |  |

This method shall support the request data structures specified in table 6.4.3.3.3.2-2 and the response data structures and response codes specified in table 6.4.3.3.3.2-3.

Table 6.4.3.3.3.2-2: Data structures supported by the PATCH Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| DAAPolicyPatch | M | 1 | Represents the parameters to request the modification of the "Individual DAA Policy" resource. |

Table 6.4.3.3.3.2-3: Data structures supported by the PATCH Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response  codes | Description |
| DAAPolicy | M | 1 | 200 OK | Successful case. The "Individual DAA Policy" resource is successfully modified and a representation of the updated resource shall be returned in the response body. |
| n/a |  |  | 204 No Content | Successful case. The "Individual DAA Policy" resource is successfully modified and no content is returned in the response body. |
| n/a |  |  | 307 Temporary Redirect | Temporary redirection. The response shall include a Location header field containing an alternative URI of the resource located in an alternative UAE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| n/a |  |  | 308 Permanent Redirect | Permanent redirection. The response shall include a Location header field containing an alternative URI of the resource located in an alternative UAE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| NOTE: The mandatory HTTP error status code for the HTTP PATCH method listed in table 5.2.6-1 of 3GPP TS 29.122 [2] shall also apply. | | | | |

Table 6.4.3.3.3.2-4: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | An alternative URI of the resource located in an alternative UAE Server. |

Table 6.4.3.3.3.2-5: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | An alternative URI of the resource located in an alternative UAE Server. |

###### 6.4.3.3.3.4 DELETE

The HTTP DELETE method allows a UASS to request the deletion of an existing "Individual DAA Policy" resource at the UAE Server.

This method shall support the URI query parameters specified in table 6.4.3.3.3.4-1.

Table 6.4.3.3.3.4-1: URI query parameters supported by the DELETE method on this resource

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description | Applicability |
| n/a |  |  |  |  |  |

This method shall support the request data structures specified in table 6.4.3.3.3.4-2 and the response data structures and response codes specified in table 6.4.3.3.3.4-3.

Table 6.4.3.3.3.4-2: Data structures supported by the DELETE Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| n/a |  |  |  |

Table 6.4.3.3.3.4-3: Data structures supported by the DELETE Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response  codes | Description |
| n/a |  |  | 204 No Content | Successful case. The "Individual DAA Policy" resource is successfully deleted. |
| n/a |  |  | 307 Temporary Redirect | Temporary redirection. The response shall include a Location header field containing an alternative URI of the resource located in an alternative UAE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| n/a |  |  | 308 Permanent Redirect | Permanent redirection. The response shall include a Location header field containing an alternative URI of the resource located in an alternative UAE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| NOTE: The mandatory HTTP error status code for the HTTP DELETE method listed in table 5.2.6-1 of 3GPP TS 29.122 [2] shall also apply. | | | | |

Table 6.4.3.3.3.4-4: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | An alternative URI of the resource located in an alternative UAE Server. |

Table 6.4.3.3.3.4-5: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | An alternative URI of the resource located in an alternative UAE Server. |

##### 6.4.3.3.4 Resource Custom Operations

There are no resource custom operations defined for this resource in this release of the specification.

### 6.4.4 Custom Operations without associated resources

#### 6.4.4.1 Overview

The structure of the custom operation URIs of the UAE\_DAASupport API is shown in Figure 6.4.4.1-1.



Figure 6.4.4.1-1: Custom operation URI structure of the UAE\_DAASupport API

Table 6.4.4.1-1 provides an overview of the custom operations and applicable HTTP methods defined for the UAE\_DAASupport API.

Table 6.4.4.1-1: Custom operations without associated resources

|  |  |  |  |
| --- | --- | --- | --- |
| Operation name | Custom operation URI | Mapped HTTP method | Description |
| InformDAAEvents | /inform-events | POST | Enables a UASS to inform about and manage possible DAA related events. |

#### 6.4.4.2 Operation: InformDAAEvents

##### 6.4.4.2.1 Description

The custom operation enables a UASS to inform about and request the management of possible DAA related events to the UAE Server.

##### 6.4.4.2.2 Operation Definition

This operation shall support the request data structures and the response data structures and response codes specified in tables 6.4.4.2.2-1 and 6.4.4.2.2-2.

Table 6.4.4.2.2-1: Data structures supported by the POST Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| InformDAAEventsReq | M | 1 | Contains the parameters to inform about and request the management of possible DAA related events. |

Table 6.4.4.2.2-2: Data structures supported by the POST Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response  codes | Description |
| n/a |  |  | 204 No Content | Successful case. The request is successfully received. |
| n/a |  |  | 307 Temporary Redirect | Temporary redirection. The response shall include a Location header field containing an alternative target URI located in an alternative UAE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| n/a |  |  | 308 Permanent Redirect | Permanent redirection. The response shall include a Location header field containing an alternative target URI located in an alternative UAE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2] |
| NOTE: The mandatory HTTP error status code for the HTTP POST method listed in table 5.2.6-1 of 3GPP TS 29.122 [2] shall also apply. | | | | |

Table 6.4.4.2.2-3: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | An alternative target URI located in an alternative UAE Server. |

Table 6.4.4.2.2-4: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | An alternative target URI located in an alternative UAE Server. |

### 6.4.5 Notifications

#### 6.4.5.1 General

Notifications shall comply to clause 5.2.5 of 3GPP TS 29.122 [2].

Table 6.4.5.1-1: Notifications overview

|  |  |  |  |
| --- | --- | --- | --- |
| Notification | Callback URI | HTTP method or custom operation | Description  (service operation) |
| DAA Policy Configuration Completion Status Notification | {notifUri}/daa-policy | daa-policy (POST) | This service operation enables a UAE Server to notify a previously subscribed UASS on the status of DAA Policy configuration. |
| DAA Event Notification | {notifUri}/daa-events | daa-events (POST) | This service operation enables a UAE Server to notify a previously subscribed UASS of DAA related event(s). |

#### 6.4.5.2 DAA Policy Configuration Completion Status Notification

##### 6.4.5.2.1 Description

The DAA Policy Configuration Completion Status Notification is used by a UAE Server to notify a previously subscribed UASS on the status of DAA Policy configuration.

##### 6.4.5.2.2 Target URI

The Callback URI **"{notifUri}**/**daa-policy"** shall be used with the callback URI variables defined in table 6.4.5.2.2-1.

Table 6.4.5.2.2-1: Callback URI variables

|  |  |  |
| --- | --- | --- |
| Name | Data type | Definition |
| notifUri | Uri | String formatted as a URI containing the Callback URI.  The notification URI is provided as part of the DAA Policy creation/update/modification request as defined in clause 6.4.3. |

##### 6.4.5.2.3 Standard Methods

###### 6.4.5.2.3.1 POST

This method shall support the request data structures specified in table 6.4.5.2.3.1-1 and the response data structures and response codes specified in table 6.4.5.2.3.1-2.

Table 6.4.5.2.3.1-1: Data structures supported by the POST Request Body

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| DAAPolConfigNotif | M | 1 | Represents a DAA Policy Configuration Status notification. |

Table 6.4.5.2.3.1-2: Data structures supported by the POST Response Body

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response codes | Description |
| n/a |  |  | 204 No Content | Successful case. The DAA Policy Configuration Status notification is successfully received and acknowledged. |
| n/a |  |  | 307 Temporary Redirect | Temporary redirection. The response shall include a Location header field containing an alternative URI representing the end point of an alternative UASS where the notification should be sent.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| n/a |  |  | 308 Permanent Redirect | Permanent redirection. The response shall include a Location header field containing an alternative URI representing the end point of an alternative UASS where the notification should be sent.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| NOTE: The mandatory HTTP error status codes for the HTTP POST method listed in table 5.2.6-1 of 3GPP TS 29.122 [2] shall also apply. | | | | |

Table 6.4.5.2.3.1-3: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | An alternative URI representing the end point of an alternative UASS towards which the notification should be redirected. |

Table 6.4.5.2.3.1-4: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | An alternative URI representing the end point of an alternative UASS towards which the notification should be redirected. |

#### 6.4.5.3 DAA Event Notification

##### 6.4.5.3.1 Description

The DAA Event Notification is used by a UAE Server to notify a previously subscribed UASS of DAA related event(s).

##### 6.4.5.3.2 Target URI

The Callback URI **"{notifUri}**/**daa-events"** shall be used with the callback URI variables defined in table 6.4.5.3.2-1.

Table 6.4.5.3.2-1: Callback URI variables

|  |  |  |
| --- | --- | --- |
| Name | Data type | Definition |
| notifUri | Uri | String formatted as a URI containing the Callback URI.  The notification URI is provided as part of the DAA Policy creation/update/modification request as defined in clause 6.4.3. |

##### 6.4.5.3.3 Standard Methods

###### 6.4.5.3.3.1 POST

This method shall support the request data structures specified in table 6.4.5.3.3.1-1 and the response data structures and response codes specified in table 6.4.5.3.3.1-2.

Table 6.4.5.3.3.1-1: Data structures supported by the POST Request Body

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| DAAEventsInfo | M | 1 | Represents a DAA Event notification. |

Table 6.4.5.3.3.1-2: Data structures supported by the POST Response Body

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response codes | Description |
| DAAEventsInfo | M | 1 | 200 OK | Successful case. The DAA event notification is successfully received and acknowledged, and the UASS returns updated/additional DAA related event information in the response body. |
| n/a |  |  | 204 No Content | Successful case. The DAA event notification is successfully received and acknowledged. |
| n/a |  |  | 307 Temporary Redirect | Temporary redirection. The response shall include a Location header field containing an alternative URI representing the end point of an alternative UASS where the notification should be sent.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| n/a |  |  | 308 Permanent Redirect | Permanent redirection. The response shall include a Location header field containing an alternative URI representing the end point of an alternative UASS where the notification should be sent.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| NOTE: The mandatory HTTP error status codes for the HTTP POST method listed in table 5.2.6-1 of 3GPP TS 29.122 [2] shall also apply. | | | | |

Table 6.4.5.3.3.1-3: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | An alternative URI representing the end point of an alternative UASS towards which the notification should be redirected. |

Table 6.4.5.3.3.1-4: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | An alternative URI representing the end point of an alternative UASS towards which the notification should be redirected. |

### 6.4.6 Data Model

#### 6.4.6.1 General

This clause specifies the application data model supported by the API.

Table 6.4.6.1-1 specifies the data types defined for the UAE\_DAASupport API.

Table 6.4.6.1-1: UAE\_DAASupport API specific Data Types

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | Clause defined | Description | Applicability |
| DAAAppPolicy | 6.4.6.2.6 | Represents a DAA Application policy. |  |
| DAAEvent | 6.4.6.2.10 | Represents a DAA related event. |  |
| DAAEventsInfo | 6.4.6.2.9 | Represents a DAA Event notification. |  |
| DAAPolConfigNotif | 6.4.6.2.8 | Represents a DAA Policy Configuration Status notification. |  |
| DAAPolReq | 6.4.6.2.2 | Represents the parameters to request the creation of a DAA Policy. |  |
| DAAPolResp | 6.4.6.2.3 | Represents the response to a DAA Policy create request. |  |
| DAAPolicy | 6.4.6.2.4 | Represents the content of a DAA Policy. |  |
| DAAPolicyPatch | 6.4.6.2.5 | Represents the parameters to request the modification of a DAA Policy. |  |
| InformDAAEventsReq | 6.4.6.2.7 | Represents the parameters to report DAA related event(s). |  |

Table 6.4.6.1-2 specifies data types re-used by the UAE\_DAASupport API from other specifications, including a reference to their respective specifications, and when needed, a short description of their use within the UAE\_DAASupport API.

Table 6.4.6.1-2: UAE\_DAASupport API re-used Data Types

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | Reference | Comments | Applicability |
| LocationInfo | 3GPP TS 29.122 [2] | Represents user location information. |  |
| SupportedFeatures | 3GPP TS 29.571 [7] | Used to negotiate the applicability of the optional features. |  |
| UasId | Clause 6.1.6.2.6 | Represents a UAV identifier. |  |
| Uri | 3GPP TS 29.122 [2] | Represents a URI. |  |

#### 6.4.6.2 Structured data types

##### 6.4.6.2.1 Introduction

This clause defines the data structures to be used in resource representations.

##### 6.4.6.2.2 Type: DAAPolReq

Table 6.4.6.2.2-1: Definition of type DAAPolReq

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| uassId | Uri | M | 1 | Contains the identity of the UASS that is sending the request. |  |
| daaPol | DAAPolicy | M | 1 | Contains the DAA Policy that shall be created. |  |
| suppFeat | SupportedFeatures | C | 0..1 | Contains the list of supported features among the ones defined in clause 6.4.8.  This attribute shall be provided if feature negotiation shall take place. |  |

##### 6.4.6.2.3 Type: DAAPolResp

Table 6.4.6.2.3-1: Definition of type DAAPolResp

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| daaPol | DAAPolicy | M | 1 | Contains the created DAA Policy. |  |
| suppFeat | SupportedFeatures | C | 0..1 | Contains the list of supported features among the ones defined in clause 6.4.8.  This attribute shall be provided if feature negotiation shall take place and this attribute was present in the corresponding request. |  |

##### 6.4.6.2.4 Type: DAAPolicy

Table 6.4.6.2.4-1: Definition of type DAAPolicy

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| uasId | UasId | M | 1 | Contains the identifier of the UAS (i.e. pair of UAV and UAV-C) to which the provided DAA Policy is related.  This shall be either in form of a UAS identifier (e.g. group ID) or a collection of individual identifiers (e.g. CAA level UAV ID, GPSI) of the UAV and UAV-C composing the UAS. |  |
| notifUri | Uri | M | 1 | Contains the notification URI via which the UASS desires to receive DAA related notifications from the UAE Server. |  |
| daaAppPol | DAAAppPolicy | C | 0..1 | Contains the DAA Application policy consisting of the requirements and policies for DAA management.  This attribute shall be provided when available. |  |

##### 6.4.6.2.5 Type: DAAPolicyPatch

Table 6.4.6.2.5-1: Definition of type DAAPolicyPatch

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| notifUri | Uri | O | 0..1 | Contains the updated notification URI via which the UASS desires to receive DAA related notifications from the UAE Server. |  |
| daaAppPol | DAAAppPolicy | O | 0..1 | Contains the updated DAA Application policy. |  |

##### 6.4.6.2.6 Type: DAAAppPolicy

Table 6.4.6.2.6-1: Definition of type DAAAppPolicy

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
|  |  |  | 1 |  |  |

Editor's Note: The definition of the DAAAppPolicy data structure is FFS.

##### 6.4.6.2.7 Type: InformDAAEventsReq

Table 6.4.6.2.7-1: Definition of type InformDAAEventsReq

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| uassId | Uri | M | 1 | Contains the identity of the UASS that is sending the request. |  |
| uasId | UasId | M | 1 | Contains the identifier of the UAS (i.e. pair of UAV and UAV-C) to which the DAA event information management request is related.  This shall be either in form of a UAS identifier (e.g. group ID) or a collection of individual identifiers (e.g. CAA level UAV ID, GPSI) of the UAV and UAV-C composing the UAS. |  |
| daaEventsInfo | array(DAAEvent) | M | 1..N | Contains the detected DAA event information. |  |
| suppFeat | SupportedFeatures | C | 0..1 | Contains the list of supported features among the ones defined in clause 6.4.8.  This attribute shall be provided if feature negotiation shall take place. |  |

##### 6.4.6.2.8 Type: DAAPolConfigNotif

Table 6.4.6.2.8-1: Definition of type DAAPolConfigNotif

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| status | DAAPolConfigStatus | M | 1 | Contains the DAA Policy configuration completion status. |  |

##### 6.4.6.2.9 Type: DAAEventsInfo

Table 6.4.6.2.9-1: Definition of type DAAEventsInfo

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| uasId | UasId | M | 1 | Contains the identifier of the UAS (i.e. pair of UAV and UAV-C) to which the DAA event information management request is related.  This shall be either in form of a UAS identifier (e.g. group ID) or a collection of individual identifiers (e.g. CAA level UAV ID, GPSI) of the UAV and UAV-C composing the UAS. |  |
| daaEventsInfo | array(DAAEvent) | M | 1..N | Contains the detected DAA event information. |  |
| suppFeat | SupportedFeatures | C | 0..1 | Contains the list of supported features among the ones defined in clause 6.4.8.  This attribute shall be provided if feature negotiation shall take place. |  |

##### 6.4.6.2.10 Type: DAAEvent

Table 6.4.6.2.10-1: Definition of type DAAEvent

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| uasId | UasId | M | 1 | Contains the identifier of the UAS (i.e. pair of UAV and UAV-C) for which a potential flight path conflict is detected.  This shall be either in form of a UAS identifier (e.g. group ID) or a collection of individual identifiers (e.g. CAA level UAV ID, GPSI) of the UAV and UAV-C composing the UAS. |  |
| uasLocInfo | LocationInfo | M | 1 | Contains the location information of the UAS with which a potential flight path conflict is detected. |  |

#### 6.4.6.3 Simple data types and enumerations

##### 6.4.6.3.1 Introduction

This clause defines simple data types and enumerations that can be referenced from data structures defined in the previous clauses.

##### 6.4.6.3.2 Simple data types

The simple data types defined in table 6.4.6.3.2-1 shall be supported.

Table 6.4.6.3.2-1: Simple data types

|  |  |  |  |
| --- | --- | --- | --- |
| Type Name | Type Definition | Description | Applicability |
|  |  |  |  |

##### 6.4.6.3.3 Enumeration: DAAPolConfigStatus

The enumeration DAAPolConfigStatus represents DAA Policy configuration completion status. It shall comply with the provisions of table 6.4.6.3.3-1.

Table 6.4.6.3.3-1: Enumeration DAAPolConfigStatus

|  |  |  |
| --- | --- | --- |
| Enumeration value | Description | Applicability |
| SUCCESSFUL | Indicates that the DAA Policy configuration was successful. |  |
| NOT\_SUCCESSFUL | Indicates that the DAA Policy configuration was not successful. |  |

#### 6.4.6.4 Data types describing alternative data types or combinations of data types

There are no data types describing alternative data types or combinations of data types defined for this API in this release of the specification.

#### 6.4.6.5 Binary data

##### 6.4.6.5.1 Binary Data Types

Table 6.4.6.5.1-1: Binary Data Types

|  |  |  |
| --- | --- | --- |
| Name | Clause defined | Content type |
|  |  |  |

### 6.4.7 Error Handling

#### 6.4.7.1 General

For the UAE\_DAASupport API, HTTP error responses shall be supported as specified in clause 5.2.6 of 3GPP TS 29.122 [2]. Protocol errors and application errors specified in clause 5.2.6 of 3GPP TS 29.122 [2] shall be supported for the HTTP status codes specified in table 5.2.6-1 of 3GPP TS 29.122 [2].

In addition, the requirements in the following clauses are applicable for the UAE\_DAASupport API.

#### 6.4.7.2 Protocol Errors

No specific protocol errors for the UAE\_DAASupport API are specified.

#### 6.4.7.3 Application Errors

The application errors defined for the UAE\_DAASupport API are listed in Table 6.4.7.3-1.

Table 6.4.7.3-1: Application errors

|  |  |  |
| --- | --- | --- |
| Application Error | HTTP status code | Description |
|  |  |  |

### 6.4.8 Feature negotiation

The optional features listed in table 6.4.8-1 are defined for the UAE\_DAASupport API. They shall be negotiated using the extensibility mechanism defined in clause 5.2.7 of 3GPP TS 29.122 [2].

Table 6.4.8-1: Supported Features

|  |  |  |
| --- | --- | --- |
| Feature number | Feature Name | Description |
|  |  |  |

### 6.4.9 Security

The provisions of clause 6 of 3GPP TS 29.122 [2] shall apply for the UAE\_DAASupport API.

# 7 Using Common API Framework

## 7.1 General

When CAPIF is used with a UAE Server service, the UAE Server shall support the following functionalities as defined in 3GPP TS 29.222 [10]:

- the API exposing function and the related APIs over CAPIF-2/2e and CAPIF-3/3e reference points;

- the API publishing function and the related APIs over CAPIF-4/4e reference point;

- the API management function and the related APIs over CAPIF-5/5e reference point; and

- at least one of the security methods for authentication and authorization, and the related security mechanisms.

In a centralized deployment as defined in 3GPP TS 23.222 [9], where the CAPIF core function and the API provider domain functions are co-located, the interactions between the CAPIF core function and the API provider domain functions may be independent of the CAPIF-3/3e, CAPIF-4/4e and CAPIF-5/5e reference points.

When CAPIF is used with a UAE Server service, the UAE Server shall register all the northbound APIs features in the CAPIF Core Function.

## 7.2 Security

When CAPIF is used for external exposure, before invoking an API exposed by the UAE Server, the service API consumer (e.g. UASS) acting as an API invoker shall negotiate the security method (PKI, TLS-PSK or OAuth 2.0) with the CAPIF core function and ensure that the UAE Server has enough credentials to authenticate the service API consumer (e.g. UASS), as defined in clauses 5.6.2.2 and 6.2.2.2 of 3GPP TS 29.222 [10].

If PKI or TLS-PSK is selected as the security method to be used between the service API consumer (e.g. UASS) and the UAE Server, upon API invocation, the UAE Server shall retrieve the authorization information from the CAPIF core function as described in clause 5.6.2.4 of 3GPP TS 29.222 [10].

As indicated in 3GPP TS 33.122 [11], the access to the UAE Server APIs may be authorized by means of the OAuth 2.0 protocol (see IETF RFC 6749 [12]), using the "Client Credentials" authorization grant, where the CAPIF core function (see 3GPP TS 29.222 [10]) plays the role of the authorization server.

NOTE 1: In this release, only "Client Credentials" authorization grant is supported.

If OAuth 2.0 is selected as the security method to be used between the service API consumer (e.g. UASS) and the UAE Server, the service API consumer (e.g. UASS) shall, prior to consuming the services offered by the UAE Server APIs, obtain a "token" from the authorization server, by invoking the Obtain\_Authorization service operation as described in clause 5.6.2.3.2 of 3GPP TS 29.222 [10].

The UAE Server APIs do not define any scopes for OAuth 2.0 authorization. It is the UAE Server responsibility to check whether the service API consumer (e.g. UASS) is authorized to use an API based on the provided "token". Once the UAE Server verifies the "token", it shall check whether the UAE Server identifier in the "token" matches its own published identifier, and whether the API name in the "token" matches its own published API name. If those checks are passed, the service API consumer (e.g. UASS) has full authority to access any resource or operation provided by the invoked API.

NOTE 2: For the aforementioned security methods, the UAE Server needs to apply admission control according to access control policies after performing the authorization checks.

Annex A (normative):  
OpenAPI specification

# A.1 General

This Annex specifies the formal definition of the API(s) defined in the present specification. It consists of OpenAPI specifications in YAML format.

This Annex takes precedence when being discrepant to other parts of the specification with respect to the encoding of information elements and methods within the API(s).

NOTE 1: The semantics and procedures, as well as conditions, e.g. for the applicability and allowed combinations of attributes or values, not expressed in the OpenAPI definitions but defined in other parts of the specification also apply.

Informative copies of the OpenAPI specification files contained in this 3GPP Technical Specification are available on a Git-based repository that uses the GitLab software version control system (see clause 5.3.1 of 3GPP TS 29.501 [3] and clause 5B of 3GPP TR 21.900 [5]).

# A.2 UAE\_C2OperationModeManagement API

openapi: 3.0.0

info:

title: UAE Server C2 Operation Mode Management Service

version: 1.1.0-alpha.1

description: |

UAE Server C2 Operation Mode Management Service.

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externalDocs:

description: >

3GPP TS 29.257 V18.1.0; Application layer support for Uncrewed Aerial System (UAS);

UAS Application Enabler (UAE) Server Services; Stage 3.

url: https://www.3gpp.org/ftp/Specs/archive/29\_series/29.257/

servers:

- url: '{apiRoot}/uae-c2opmode-mngt/v1'

variables:

apiRoot:

default: https://example.com

description: apiRoot as defined in clause 5.2.4 of 3GPP TS 29.122

security:

- {}

- oAuth2ClientCredentials: []

paths:

/initiate:

post:

summary: Request the provisioning of C2 Operation Mode configuration information for a UAS (i.e. pair of UAV and UAV-C).

operationId: InitiateC2OpModeConfig

tags:

- Initiate C2 Operation Mode configuration

requestBody:

required: true

content:

application/json:

schema:

$ref: '#/components/schemas/ConfigureData'

responses:

'200':

description: >

The communicated C2 Operation Mode configuration information was successfully

received. The response body contains the feedback of the UAE Server on whether

this C2 Operation Mode configuration request is confirmed (i.e. can be undertaken

by the UAE Server) or not.

content:

application/json:

schema:

$ref: '#/components/schemas/C2Result'

'307':

$ref: 'TS29122\_CommonData.yaml#/components/responses/307'

'308':

$ref: 'TS29122\_CommonData.yaml#/components/responses/308'

'400':

$ref: 'TS29122\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29122\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29122\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29122\_CommonData.yaml#/components/responses/404'

'411':

$ref: 'TS29122\_CommonData.yaml#/components/responses/411'

'413':

$ref: 'TS29122\_CommonData.yaml#/components/responses/413'

'415':

$ref: 'TS29122\_CommonData.yaml#/components/responses/415'

'429':

$ref: 'TS29122\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29122\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29122\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29122\_CommonData.yaml#/components/responses/default'

callbacks:

C2OpModeMngtCompletionNotification:

'{$request.body#/notificationUri}/c2mode-mngt-completion':

post:

requestBody:

required: true

content:

application/json:

schema:

$ref: '#/components/schemas/C2OpModeMngtCompStatus'

responses:

'204':

description: >

No Content. The notification was succesfull and the C2 Operation Mode

Management Completion status for the concerned UAS (i.e. pair of UAV

and UAV-C) was successfully received and acknowledged by the UASS.

'307':

$ref: 'TS29122\_CommonData.yaml#/components/responses/307'

'308':

$ref: 'TS29122\_CommonData.yaml#/components/responses/308'

'400':

$ref: 'TS29122\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29122\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29122\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29122\_CommonData.yaml#/components/responses/404'

'411':

$ref: 'TS29122\_CommonData.yaml#/components/responses/411'

'413':

$ref: 'TS29122\_CommonData.yaml#/components/responses/413'

'415':

$ref: 'TS29122\_CommonData.yaml#/components/responses/415'

'429':

$ref: 'TS29122\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29122\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29122\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29122\_CommonData.yaml#/components/responses/default'

SelectedC2CommunicationModeNotification:

'{$request.body#/notificationUri}/inform-selec-c2mode':

post:

requestBody:

required: true

content:

application/json:

schema:

$ref: '#/components/schemas/SelectedC2CommModeNotif'

responses:

'204':

description: >

No Content. The notification was succesfull and the C2 Communication Mode

selected by the concerned UAS (i.e. pair of UAV and UAV-C) was successfully

received and acknowledged by the UASS.

'307':

$ref: 'TS29122\_CommonData.yaml#/components/responses/307'

'308':

$ref: 'TS29122\_CommonData.yaml#/components/responses/308'

'400':

$ref: 'TS29122\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29122\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29122\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29122\_CommonData.yaml#/components/responses/404'

'411':

$ref: 'TS29122\_CommonData.yaml#/components/responses/411'

'413':

$ref: 'TS29122\_CommonData.yaml#/components/responses/413'

'415':

$ref: 'TS29122\_CommonData.yaml#/components/responses/415'

'429':

$ref: 'TS29122\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29122\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29122\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29122\_CommonData.yaml#/components/responses/default'

C2CommunicationModeSwitchingNotification:

'{$request.body#/notificationUri}/inform-c2mode-switch':

post:

requestBody:

required: true

content:

application/json:

schema:

$ref: '#/components/schemas/C2CommModeSwitchNotif'

responses:

'200':

description: >

OK. The targeted C2 Communication Mode switching for the concerned UAS

(i.e. pair of UAV and UAV-C) is successfully received. The response body

contains the feedback of the UASS on whether this C2 Communication Mode

switching is confirmed (i.e. validated) or not.

content:

application/json:

schema:

$ref: '#/components/schemas/C2Result'

'204':

description: >

No Content. The targeted C2 Communication Mode switching for the concerned

UAS (i.e. pair of UAV and UAV-C) is successfully received and acknowledged,

and the UASS does not need to confirm (i.e. validate) it.

'307':

$ref: 'TS29122\_CommonData.yaml#/components/responses/307'

'308':

$ref: 'TS29122\_CommonData.yaml#/components/responses/308'

'400':

$ref: 'TS29122\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29122\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29122\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29122\_CommonData.yaml#/components/responses/404'

'411':

$ref: 'TS29122\_CommonData.yaml#/components/responses/411'

'413':

$ref: 'TS29122\_CommonData.yaml#/components/responses/413'

'415':

$ref: 'TS29122\_CommonData.yaml#/components/responses/415'

'429':

$ref: 'TS29122\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29122\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29122\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29122\_CommonData.yaml#/components/responses/default'

components:

securitySchemes:

oAuth2ClientCredentials:

type: oauth2

flows:

clientCredentials:

tokenUrl: '{tokenUrl}'

scopes: {}

schemas:

ConfigureData:

description: >

Represents the parameters to request to provision C2 Operation Mode configuration

information for a UAS (i.e. pair of UAV and UAV-C).

type: object

properties:

uassId:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/Uri'

uasId:

$ref: '#/components/schemas/UasId'

allowedC2CommModes:

type: array

items:

$ref: '#/components/schemas/C2CommMode'

minItems: 1

c2CommModeSwitchTypes:

type: array

items:

$ref: '#/components/schemas/C2CommModeSwitching'

minItems: 1

notificationUri:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/Uri'

primaryC2CommMode:

$ref: '#/components/schemas/C2CommMode'

secondaryC2CommMode:

$ref: '#/components/schemas/C2CommMode'

c2SwitchPolicies:

$ref: '#/components/schemas/C2SwitchPolicies'

c2ServiceArea:

$ref: '#/components/schemas/C2ServiceArea'

suppFeat:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/SupportedFeatures'

required:

- uassId

- uasId

- allowedC2CommModes

- c2CommModeSwitchTypes

- notificationUri

- primaryC2CommMode

- c2SwitchPolicies

SelectedC2CommModeNotif:

description: >

Represents information on the C2 Communication Mode selected by a UAS (i.e. pair of

UAV and UAV-C).

type: object

properties:

uasId:

$ref: '#/components/schemas/UasId'

selPrimaryC2CommMode:

$ref: '#/components/schemas/C2CommMode'

selSecondaryC2CommMode:

$ref: '#/components/schemas/C2CommMode'

required:

- uasId

- selPrimaryC2CommMode

C2CommModeSwitchNotif:

description: >

Represents information on the targeted C2 Communication Mode switching for a UAS

(i.e. pair of UAV and UAV-C).

type: object

properties:

uaeServerId:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/Uri'

uasId:

$ref: '#/components/schemas/UasId'

c2CommModeSwitchType:

$ref: '#/components/schemas/C2CommModeSwitching'

switchingCause:

$ref: '#/components/schemas/C2SwitchingCause'

required:

- uaeServerId

- uasId

- c2CommModeSwitchType

C2Result:

description: Represents the result of an action related to C2 of a UAS.

type: object

properties:

c2OpConfirmed:

type: boolean

suppFeat:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/SupportedFeatures'

required:

- c2OpConfirmed

UasId:

description: Represents the identifier of a UAS (i.e. pair of UAV and UAV-C).

type: object

properties:

groupId:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/ExternalGroupId'

individualUasId:

type: array

items:

$ref: '#/components/schemas/UavId'

minItems: 2

oneOf:

- required: [groupId]

- required: [individualUasId]

UavId:

description: Represents the identifier of a UAV (e.g. UAV, UAV-C).

type: object

properties:

gpsi:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/Gpsi'

caaId:

type: string

anyOf:

- required: [gpsi]

- required: [caaId]

C2ServiceArea:

description: Represents a C2 service area.

type: object

properties:

ncgiList:

type: array

items:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/Ncgi'

taiList:

type: array

items:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/Tai'

geographicAreaList:

type: array

items:

$ref: 'TS29572\_Nlmf\_Location.yaml#/components/schemas/GeographicArea'

oneOf:

- required: [geographicAreaList]

- anyOf:

- required: [ncgiList]

- required: [taiList]

C2OpModeMngtCompStatus:

description: >

Represents the C2 Operation Mode Management Completion status for a UAV

(e.g. UAV, UAV-C).

type: object

properties:

uasId:

$ref: '#/components/schemas/UasId'

status:

$ref: '#/components/schemas/C2OpModeStatus'

required:

- uasId

- status

C2SwitchPolicies:

description: Represents the C2 operation mode switching policies.

type: object

properties:

directC2LinkQualityThrlds:

$ref: '#/components/schemas/C2LinkQualityThrlds'

uuC2LinkQualityThrlds:

$ref: '#/components/schemas/C2LinkQualityThrlds'

C2LinkQualityThrlds:

description: Represents the C2 link quality thresholds.

type: object

properties:

nrRsrpThrldLow:

type: integer

minimum: 0

maximum: 127

nrRsrpThrldHigh:

type: integer

minimum: 0

maximum: 127

nrRsrqThrldLow:

type: integer

minimum: 0

maximum: 127

nrRsrqThrldHigh:

type: integer

minimum: 0

maximum: 127

packetLossThrldLow:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/PacketLossRate'

packetLossThrldHigh:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/PacketLossRate'

# ENUMS:

C2CommMode:

anyOf:

- type: string

enum:

- DIRECT\_C2\_COMMUNICATION

- NETWORK\_ASSISTED\_C2\_COMMUNICATION

- UTM\_NAVIGATED\_C2\_COMMUNICATION

- type: string

description: >

This string provides forward-compatibility with future extensions to the enumeration

and is not used to encode content defined in the present version of this API.

description: |

Represents the C2 Communication Mode.

Possible values are:

- DIRECT\_C2\_COMMUNICATION: Indicates Direct C2 Communication mode.

- NETWORK\_ASSISTED\_C2\_COMMUNICATION: Indicates Network-Assisted C2 Communication mode.

- UTM\_NAVIGATED\_C2\_COMMUNICATION: Indicates UTM-Navigated C2 communication mode.

C2CommModeSwitching:

anyOf:

- type: string

enum:

- DIRECT\_TO\_NETWORK\_ASSISTED\_C2

- NETWORK\_ASSISTED\_TO\_DIRECT\_C2

- DIRECT\_TO\_UTM\_NAVIGATED\_C2

- NETWORK\_ASSISTED\_TO\_UTM\_NAVIGATED\_C2

- type: string

description: >

This string provides forward-compatibility with future extensions to the enumeration

and is not used to encode content defined in the present version of this API.

description: |

Represents the C2 Communication Mode Switching type.

Possible values are:

- DIRECT\_TO\_NETWORK\_ASSISTED\_C2: Indicates the C2 Communication Mode switching from Direct

C2 Communication mode to Network-Assisted C2 Communication mode.

- NETWORK\_ASSISTED\_TO\_DIRECT\_C2: Indicates the C2 Communication Mode switching from

Network-Assisted C2 Communication mode to Direct C2 Communication mode.

- DIRECT\_TO\_UTM\_NAVIGATED\_C2: Indicates the C2 Communication Mode switching from

Direct C2 Communication mode to UTM-Navigated C2 communication mode.

- NETWORK\_ASSISTED\_TO\_UTM\_NAVIGATED\_C2: Indicates the C2 Communication Mode switching

from Network-Assisted C2 Communication mode to UTM-Navigated C2 communication mode.

C2SwitchingCause:

anyOf:

- type: string

enum:

- DIRECT\_LINK\_QUALITY\_DEGRADATION

- DIRECT\_LINK\_AVAILABLE

- MOVING\_BVLOS

- LOCATION\_CHANGE

- TRAFFIC\_CONTROL\_NEEDED

- SECURITY\_REASONS

- OTHER\_REASONS

- type: string

description: >

This string provides forward-compatibility with future extensions to the enumeration

and is not used to encode content defined in the present version of this API.

description: |

Represents the C2 Communication Mode switching cause.

Possible values are:

- DIRECT\_LINK\_QUALITY\_DEGRADATION: Indicates that the C2 Communication Mode switching

was triggered due to a degradation in the direct radio link quality.

- DIRECT\_LINK\_AVAILABLE: Indicates that the C2 Communication Mode switching was triggered

due to the availability of a direct link, i.e. direct radio link quality enables its

usage.

- MOVING\_BVLOS: Indicates that the C2 Communication Mode switching was triggered due to

the UAV moving BVLOS.

- LOCATION\_CHANGE: Indicates that the C2 Communication Mode switching was triggered due to

an actual or expected location/mobility of the UAV (e.g. which impacts the UAV-to-UAV-C

location).

- TRAFFIC\_CONTROL\_NEEDED: Indicates that the C2 Communication Mode switching was triggered

due to the necessity to have air traffic control.

- SECURITY\_REASONS: Indicates that the C2 Communication Mode switching was triggered due to

security reasons.

- OTHER\_REASONS: Indicates that the C2 Communication Mode switching was triggered due to

other reasons (e.g. unpredictable event, unknown reason, weather conditions, topography,

etc.).

C2OpModeStatus:

anyOf:

- type: string

enum:

- SUCCESSFUL

- NOT\_SUCCESSFUL

- type: string

description: >

This string provides forward-compatibility with future extensions to the enumeration

and is not used to encode content defined in the present version of this API.

description: |

Represents the C2 operation mode management completion status.

Possible values are:

- SUCCESSFUL: Indicates that the C2 operation mode configuration was successful.

- NOT\_SUCCESSFUL: Indicates that the C2 operation mode configuration was not successful.

# A.3 UAE\_RealtimeUAVStatus API

openapi: 3.0.0

info:

title: UAE Server Real-time UAV Status Service

version: 1.0.0

description: |

UAE Server Real-time UAV Status Service.

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externalDocs:

description: >

3GPP TS 29.257 V17.1.0; Application layer support for Uncrewed Aerial System (UAS);

UAS Application Enabler (UAE) Server Services; Stage 3.

url: https://www.3gpp.org/ftp/Specs/archive/29\_series/29.257/

servers:

- url: '{apiRoot}/uae-uav-status/v1'

variables:

apiRoot:

default: https://example.com

description: apiRoot as defined in clause 5.2.4 of 3GPP TS 29.122

security:

- {}

- oAuth2ClientCredentials: []

paths:

/subscriptions:

get:

summary: Retrieve all the active real-time UAV status subscriptions managed by the UAE Server.

operationId: GetRTUavStatusSubscriptions

tags:

- Real-time UAV Status Subscriptions (Collection)

responses:

'200':

description: >

OK. All the active real-time UAV status subscriptions managed by the UAE Server

shall be returned.

content:

application/json:

schema:

type: array

items:

$ref: '#/components/schemas/RTUavStatusSubsc'

'307':

$ref: 'TS29122\_CommonData.yaml#/components/responses/307'

'308':

$ref: 'TS29122\_CommonData.yaml#/components/responses/308'

'400':

$ref: 'TS29122\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29122\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29122\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29122\_CommonData.yaml#/components/responses/404'

'406':

$ref: 'TS29122\_CommonData.yaml#/components/responses/406'

'429':

$ref: 'TS29122\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29122\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29122\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29122\_CommonData.yaml#/components/responses/default'

post:

summary: Request the creation of a subscription to real-time UAV status reporting.

operationId: CreateRTUavStatusSubsc

tags:

- Real-time UAV Status Subscriptions (Collection)

requestBody:

required: true

content:

application/json:

schema:

$ref: '#/components/schemas/RTUavStatusSubsc'

responses:

'200':

description: >

OK. The subscription is successfully created and a representation of the created

Individual Real-time UAV Status Subscription resource shall be returned.

content:

application/json:

schema:

$ref: '#/components/schemas/RTUavStatusSubsc'

headers:

Location:

description: >

Contains the URI of the created Individual Real-time UAV Status Subscription

resource.

required: true

schema:

type: string

'400':

$ref: 'TS29122\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29122\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29122\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29122\_CommonData.yaml#/components/responses/404'

'411':

$ref: 'TS29122\_CommonData.yaml#/components/responses/411'

'413':

$ref: 'TS29122\_CommonData.yaml#/components/responses/413'

'415':

$ref: 'TS29122\_CommonData.yaml#/components/responses/415'

'429':

$ref: 'TS29122\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29122\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29122\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29122\_CommonData.yaml#/components/responses/default'

callbacks:

RTUavStatusNotification:

'{$request.body#/notificationUri}/uav-status':

post:

requestBody:

required: true

content:

application/json:

schema:

$ref: '#/components/schemas/RTUavStatusNotif'

responses:

'204':

description: >

No Content. The real-time UAV status notification is successfully

received and acknowledged.

'307':

$ref: 'TS29122\_CommonData.yaml#/components/responses/307'

'308':

$ref: 'TS29122\_CommonData.yaml#/components/responses/308'

'400':

$ref: 'TS29122\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29122\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29122\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29122\_CommonData.yaml#/components/responses/404'

'411':

$ref: 'TS29122\_CommonData.yaml#/components/responses/411'

'413':

$ref: 'TS29122\_CommonData.yaml#/components/responses/413'

'415':

$ref: 'TS29122\_CommonData.yaml#/components/responses/415'

'429':

$ref: 'TS29122\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29122\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29122\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29122\_CommonData.yaml#/components/responses/default'

/subscriptions/{subscriptionId}:

get:

summary: Retrieve a real-time UAV status subscription resource.

operationId: GetRTUavStatusSubscription

tags:

- Individual Real-time UAV Status Subscription (Document)

parameters:

- name: subscriptionId

in: path

description: Individual Real-time UAV Status Subscription identifier.

required: true

schema:

type: string

responses:

'200':

description: OK. The requested real-time UAV status subscription resource shall be returned.

content:

application/json:

schema:

$ref: '#/components/schemas/RTUavStatusSubsc'

'307':

$ref: 'TS29122\_CommonData.yaml#/components/responses/307'

'308':

$ref: 'TS29122\_CommonData.yaml#/components/responses/308'

'400':

$ref: 'TS29122\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29122\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29122\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29122\_CommonData.yaml#/components/responses/404'

'406':

$ref: 'TS29122\_CommonData.yaml#/components/responses/406'

'429':

$ref: 'TS29122\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29122\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29122\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29122\_CommonData.yaml#/components/responses/default'

put:

summary: Request the update of an existing real-time UAV status subscription.

operationId: UpdateRTUavStatusSubscription

tags:

- Individual Real-time UAV Status Subscription (Document)

parameters:

- name: subscriptionId

in: path

description: Individual Real-time UAV Status Subscription identifier.

required: true

schema:

type: string

requestBody:

required: true

content:

application/json:

schema:

$ref: '#/components/schemas/RTUavStatusSubsc'

responses:

'200':

description: >

OK. The real-time UAV status subscription is successfully updated and a

representation of the updated Individual Real-time UAV Status Subscription

resource shall be returned.

content:

application/json:

schema:

$ref: '#/components/schemas/RTUavStatusSubsc'

'204':

description: No Content. The real-time UAV status subscription is successfully updated.

'307':

$ref: 'TS29122\_CommonData.yaml#/components/responses/307'

'308':

$ref: 'TS29122\_CommonData.yaml#/components/responses/308'

'400':

$ref: 'TS29122\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29122\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29122\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29122\_CommonData.yaml#/components/responses/404'

'406':

$ref: 'TS29122\_CommonData.yaml#/components/responses/406'

'429':

$ref: 'TS29122\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29122\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29122\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29122\_CommonData.yaml#/components/responses/default'

delete:

summary: Request the deletion of an existing real-time UAV status subscription.

operationId: DeleteRTUavStatusSubscription

tags:

- Individual Real-time UAV Status Subscription (Document)

parameters:

- name: subscriptionId

in: path

description: Individual Real-time UAV Status Subscription identifier.

required: true

schema:

type: string

responses:

'204':

description: >

No Content. The Individual Real-time UAV Status Subscription resource

is successfully deleted.

'307':

$ref: 'TS29122\_CommonData.yaml#/components/responses/307'

'308':

$ref: 'TS29122\_CommonData.yaml#/components/responses/308'

'400':

$ref: 'TS29122\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29122\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29122\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29122\_CommonData.yaml#/components/responses/404'

'406':

$ref: 'TS29122\_CommonData.yaml#/components/responses/406'

'429':

$ref: 'TS29122\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29122\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29122\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29122\_CommonData.yaml#/components/responses/default'

components:

securitySchemes:

oAuth2ClientCredentials:

type: oauth2

flows:

clientCredentials:

tokenUrl: '{tokenUrl}'

scopes: {}

schemas:

RTUavStatusSubsc:

description: >

Represents the parameters to request the creation or update of a subscription

to real-time UAV status reporting.

type: object

properties:

uassId:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/Uri'

uavIds:

type: array

items:

$ref: 'TS29257\_UAE\_C2OperationModeManagement.yaml#/components/schemas/UavId'

minItems: 1

notificationUri:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/Uri'

suppFeat:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/SupportedFeatures'

required:

- uassId

- uavIds

- notificationUri

RTUavStatusNotif:

description: Represents a real-time UAV status notification.

type: object

properties:

subscriptionId:

type: string

rTUavStatus:

type: array

items:

$ref: '#/components/schemas/RTUavStatus'

minItems: 1

required:

- subscriptionId

- rTUavStatus

RTUavStatus:

description: Represents real-time UAV status information.

type: object

properties:

uavId:

$ref: 'TS29257\_UAE\_C2OperationModeManagement.yaml#/components/schemas/UavId'

uavNetConnStatus:

$ref: '#/components/schemas/UavNetConnStatus'

uavLocInfo:

$ref: 'TS29122\_MonitoringEvent.yaml#/components/schemas/LocationInfo'

allOf:

- required: [uavId]

- oneOf:

- required: [uavLocInfo]

- allOf:

- required: [uavLocInfo]

- required: [uavNetConnStatus]

UavNetConnStatus:

description: Represents UAV network connection status information.

type: object

properties:

statusInfo:

$ref: 'TS29122\_MonitoringEvent.yaml#/components/schemas/MonitoringType'

timestamp:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/DateTime'

required:

- statusInfo

- timestamp

# A.4 UAE\_ChangeUSSManagement API

openapi: 3.0.0

info:

title: UAE Server USS Change Management Service

version: 1.0.0-alpha.1

description: |

UAE Server USS Change Management Service.

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externalDocs:

description: >

3GPP TS 29.257 V18.1.0; Application layer support for Uncrewed Aerial System (UAS);

UAS Application Enabler (UAE) Server Services; Stage 3.

url: https://www.3gpp.org/ftp/Specs/archive/29\_series/29.257/

servers:

- url: '{apiRoot}/uae-usschange-mngt/v1'

variables:

apiRoot:

default: https://example.com

description: apiRoot as defined in clause 5.2.4 of 3GPP TS 29.122

security:

- {}

- oAuth2ClientCredentials: []

paths:

/policies:

get:

summary: Retrieve all the active USS Change Policies managed by the UAE Server.

operationId: GetUSSChangePolicies

tags:

- USS Change Policies (Collection)

responses:

'200':

description: >

OK. All the active USS Change Policies managed by the UAE Server shall be returned.

content:

application/json:

schema:

type: array

items:

$ref: '#/components/schemas/USSChangePolicy'

'307':

$ref: 'TS29122\_CommonData.yaml#/components/responses/307'

'308':

$ref: 'TS29122\_CommonData.yaml#/components/responses/308'

'400':

$ref: 'TS29122\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29122\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29122\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29122\_CommonData.yaml#/components/responses/404'

'406':

$ref: 'TS29122\_CommonData.yaml#/components/responses/406'

'429':

$ref: 'TS29122\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29122\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29122\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29122\_CommonData.yaml#/components/responses/default'

post:

summary: Request the creation of a USS Change Policy.

operationId: CreateUSSChangePolicy

tags:

- USS Change Policies (Collection)

requestBody:

required: true

content:

application/json:

schema:

$ref: '#/components/schemas/USSChangePolReq'

responses:

'200':

description: >

OK. The USS Change Policy is successfully created and a representation of the created

Individual USS Change Policy resource shall be returned.

content:

application/json:

schema:

$ref: '#/components/schemas/USSChangePolResp'

headers:

Location:

description: >

Contains the URI of the created Individual USS Change Policy resource.

required: true

schema:

type: string

'400':

$ref: 'TS29122\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29122\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29122\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29122\_CommonData.yaml#/components/responses/404'

'411':

$ref: 'TS29122\_CommonData.yaml#/components/responses/411'

'413':

$ref: 'TS29122\_CommonData.yaml#/components/responses/413'

'415':

$ref: 'TS29122\_CommonData.yaml#/components/responses/415'

'429':

$ref: 'TS29122\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29122\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29122\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29122\_CommonData.yaml#/components/responses/default'

#Editor's Note: The definition of the notifications is FFS.

/policies/{policyId}:

parameters:

- name: policyId

in: path

description: Represents the identifier of the Individual USS Change Policy resource.

required: true

schema:

type: string

get:

summary: Retrieve an existing Individual USS Change Policy resource.

operationId: GetUSSChangePolicy

tags:

- Individual USS Change Policy (Document)

responses:

'200':

description: OK. The requested Individual USS Change Policy resource shall be returned.

content:

application/json:

schema:

$ref: '#/components/schemas/USSChangePolicy'

'307':

$ref: 'TS29122\_CommonData.yaml#/components/responses/307'

'308':

$ref: 'TS29122\_CommonData.yaml#/components/responses/308'

'400':

$ref: 'TS29122\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29122\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29122\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29122\_CommonData.yaml#/components/responses/404'

'406':

$ref: 'TS29122\_CommonData.yaml#/components/responses/406'

'429':

$ref: 'TS29122\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29122\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29122\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29122\_CommonData.yaml#/components/responses/default'

put:

summary: Request the update of an existing Individual USS Change Policy resource.

operationId: UpdateUSSChangePolicy

tags:

- Individual USS Change Policy (Document)

requestBody:

required: true

content:

application/json:

schema:

$ref: '#/components/schemas/USSChangePolicy'

responses:

'200':

description: >

OK. The Individual USS Change Policy resource is successfully updated and a

representation of the updated resource shall be returned in the response body.

content:

application/json:

schema:

$ref: '#/components/schemas/USSChangePolicy'

'204':

description: >

No Content. The Individual USS Change Policy resource is successfully updated and no

content is returned in the response body.

'307':

$ref: 'TS29122\_CommonData.yaml#/components/responses/307'

'308':

$ref: 'TS29122\_CommonData.yaml#/components/responses/308'

'400':

$ref: 'TS29122\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29122\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29122\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29122\_CommonData.yaml#/components/responses/404'

'406':

$ref: 'TS29122\_CommonData.yaml#/components/responses/406'

'429':

$ref: 'TS29122\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29122\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29122\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29122\_CommonData.yaml#/components/responses/default'

patch:

summary: Request the modification of an existing Individual USS Change Policy resource.

operationId: ModifyUSSChangePolicy

tags:

- Individual USS Change Policy (Document)

requestBody:

required: true

content:

application/merge-patch+json:

schema:

$ref: '#/components/schemas/USSChangePolicyPatch'

responses:

'200':

description: >

OK. The Individual USS Change Policy resource is successfully modified and a

representation of the updated resource shall be returned in the response body.

content:

application/json:

schema:

$ref: '#/components/schemas/USSChangePolicy'

'204':

description: >

No Content. The Individual USS Change Policy resource is successfully modified and no

content is returned in the response body.

'307':

$ref: 'TS29122\_CommonData.yaml#/components/responses/307'

'308':

$ref: 'TS29122\_CommonData.yaml#/components/responses/308'

'400':

$ref: 'TS29122\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29122\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29122\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29122\_CommonData.yaml#/components/responses/404'

'406':

$ref: 'TS29122\_CommonData.yaml#/components/responses/406'

'429':

$ref: 'TS29122\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29122\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29122\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29122\_CommonData.yaml#/components/responses/default'

delete:

summary: Request the deletion of an existing Individual USS Change Policy resource.

operationId: DeleteUSSChangePolicy

tags:

- Individual USS Change Policy (Document)

responses:

'204':

description: >

No Content. The Individual USS Change Policy resource is successfully deleted.

'307':

$ref: 'TS29122\_CommonData.yaml#/components/responses/307'

'308':

$ref: 'TS29122\_CommonData.yaml#/components/responses/308'

'400':

$ref: 'TS29122\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29122\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29122\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29122\_CommonData.yaml#/components/responses/404'

'406':

$ref: 'TS29122\_CommonData.yaml#/components/responses/406'

'429':

$ref: 'TS29122\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29122\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29122\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29122\_CommonData.yaml#/components/responses/default'

/request-usschange:

post:

summary: Request USS change.

operationId: RequestUSSChange

tags:

- Request USS Change

requestBody:

required: true

content:

application/json:

schema:

$ref: '#/components/schemas/USSChangeReq'

responses:

'204':

description: >

No Content. The USS change request is successfully received.

'307':

$ref: 'TS29122\_CommonData.yaml#/components/responses/307'

'308':

$ref: 'TS29122\_CommonData.yaml#/components/responses/308'

'400':

$ref: 'TS29122\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29122\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29122\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29122\_CommonData.yaml#/components/responses/404'

'411':

$ref: 'TS29122\_CommonData.yaml#/components/responses/411'

'413':

$ref: 'TS29122\_CommonData.yaml#/components/responses/413'

'415':

$ref: 'TS29122\_CommonData.yaml#/components/responses/415'

'429':

$ref: 'TS29122\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29122\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29122\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29122\_CommonData.yaml#/components/responses/default'

components:

securitySchemes:

oAuth2ClientCredentials:

type: oauth2

flows:

clientCredentials:

tokenUrl: '{tokenUrl}'

scopes: {}

schemas:

USSChangePolReq:

description: >

Represents the parameters to request the creation/Update of a USS Change Policy.

type: object

properties:

uassId:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/Uri'

ussChangePol:

$ref: '#/components/schemas/USSChangePolicy'

suppFeat:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/SupportedFeatures'

required:

- uassId

- ussChangePol

USSChangePolResp:

description: Represents the response to a USS Change Policy create/update request.

type: object

properties:

ussChangePol:

$ref: '#/components/schemas/USSChangePolicy'

suppFeat:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/SupportedFeatures'

required:

- ussChangePol

USSChangePolicy:

description: Represents a USS Change Policy.

type: object

properties:

uasId:

$ref: 'TS29257\_UAE\_C2OperationModeManagement.yaml#/components/schemas/UasId'

notifUri:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/Uri'

required:

- uasId

- notifUri

USSChangePolicyPatch:

description: >

Represents the parameters to request the modification of a USS Change Policy.

type: object

properties:

notifUri:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/Uri'

USSChangeReq:

description: Represents the parameters to request for USS change.

type: object

properties:

uassId:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/Uri'

uasId:

$ref: 'TS29257\_UAE\_C2OperationModeManagement.yaml#/components/schemas/UasId'

suppFeat:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/SupportedFeatures'

required:

- uassId

- uasId

# A.5 UAE\_DAASupport API

openapi: 3.0.0

info:

title: UAE Server DAA Support Service

version: 1.0.0-alpha.2

description: |

UAE Server DAA Support Service.

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externalDocs:

description: >

3GPP TS 29.257 V18.2.0; Application layer support for Uncrewed Aerial System (UAS);

UAS Application Enabler (UAE) Server Services; Stage 3.

url: https://www.3gpp.org/ftp/Specs/archive/29\_series/29.257/

servers:

- url: '{apiRoot}/uae-daa/v1'

variables:

apiRoot:

default: https://example.com

description: apiRoot as defined in clause 5.2.4 of 3GPP TS 29.122

security:

- {}

- oAuth2ClientCredentials: []

paths:

/policies:

get:

summary: Retrieve all the active DAA Policies managed by the UAE Server.

operationId: GetDAAPolicies

tags:

- DAA Policies (Collection)

responses:

'200':

description: >

OK. All the active DAA Policies managed by the UAE Server shall be returned.

content:

application/json:

schema:

type: array

items:

$ref: '#/components/schemas/DAAPolicy'

'307':

$ref: 'TS29122\_CommonData.yaml#/components/responses/307'

'308':

$ref: 'TS29122\_CommonData.yaml#/components/responses/308'

'400':

$ref: 'TS29122\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29122\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29122\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29122\_CommonData.yaml#/components/responses/404'

'406':

$ref: 'TS29122\_CommonData.yaml#/components/responses/406'

'429':

$ref: 'TS29122\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29122\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29122\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29122\_CommonData.yaml#/components/responses/default'

post:

summary: Request the creation of a DAA Policy.

operationId: CreateDAAPolicy

tags:

- DAA Policies (Collection)

requestBody:

required: true

content:

application/json:

schema:

$ref: '#/components/schemas/DAAPolReq'

responses:

'200':

description: >

OK. The DAA Policy is successfully created and a representation of the created

Individual DAA Policy resource shall be returned.

content:

application/json:

schema:

$ref: '#/components/schemas/DAAPolResp'

headers:

Location:

description: >

Contains the URI of the created Individual DAA Policy resource.

required: true

schema:

type: string

'400':

$ref: 'TS29122\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29122\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29122\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29122\_CommonData.yaml#/components/responses/404'

'411':

$ref: 'TS29122\_CommonData.yaml#/components/responses/411'

'413':

$ref: 'TS29122\_CommonData.yaml#/components/responses/413'

'415':

$ref: 'TS29122\_CommonData.yaml#/components/responses/415'

'429':

$ref: 'TS29122\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29122\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29122\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29122\_CommonData.yaml#/components/responses/default'

callbacks:

DAAPolCompStatusNotif:

'{$request.body#/daaPol/notifUri}/daa-policy':

post:

requestBody:

required: true

content:

application/json:

schema:

$ref: '#/components/schemas/DAAPolConfigNotif'

responses:

'204':

description: >

No Content. The DAA Policy Configuration Status notification is successfully

received and acknowledged.

'307':

$ref: 'TS29122\_CommonData.yaml#/components/responses/307'

'308':

$ref: 'TS29122\_CommonData.yaml#/components/responses/308'

'400':

$ref: 'TS29122\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29122\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29122\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29122\_CommonData.yaml#/components/responses/404'

'411':

$ref: 'TS29122\_CommonData.yaml#/components/responses/411'

'413':

$ref: 'TS29122\_CommonData.yaml#/components/responses/413'

'415':

$ref: 'TS29122\_CommonData.yaml#/components/responses/415'

'429':

$ref: 'TS29122\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29122\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29122\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29122\_CommonData.yaml#/components/responses/default'

DAAEventsNotif:

'{$request.body#/daaPol/notifUri}/daa-events':

post:

requestBody:

required: true

content:

application/json:

schema:

$ref: '#/components/schemas/DAAEventsInfo'

responses:

'200':

description: >

OK. The DAA event notification is successfully received and acknowledged, and

the UASS returns updated/additional DAA related event information in the

response body.

content:

application/json:

schema:

$ref: '#/components/schemas/DAAEventsInfo'

'204':

description: >

No Content. The DAA event notification is successfully received and

acknowledged.

'307':

$ref: 'TS29122\_CommonData.yaml#/components/responses/307'

'308':

$ref: 'TS29122\_CommonData.yaml#/components/responses/308'

'400':

$ref: 'TS29122\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29122\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29122\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29122\_CommonData.yaml#/components/responses/404'

'411':

$ref: 'TS29122\_CommonData.yaml#/components/responses/411'

'413':

$ref: 'TS29122\_CommonData.yaml#/components/responses/413'

'415':

$ref: 'TS29122\_CommonData.yaml#/components/responses/415'

'429':

$ref: 'TS29122\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29122\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29122\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29122\_CommonData.yaml#/components/responses/default'

/policies/{policyId}:

parameters:

- name: policyId

in: path

description: Represents the identifier of the Individual DAA Policy resource.

required: true

schema:

type: string

get:

summary: Retrieve an existing Individual DAA Policy resource.

operationId: GetIndDAAPolicy

tags:

- Individual DAA Policy (Document)

responses:

'200':

description: OK. The requested Individual DAA Policy resource shall be returned.

content:

application/json:

schema:

$ref: '#/components/schemas/DAAPolicy'

'307':

$ref: 'TS29122\_CommonData.yaml#/components/responses/307'

'308':

$ref: 'TS29122\_CommonData.yaml#/components/responses/308'

'400':

$ref: 'TS29122\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29122\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29122\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29122\_CommonData.yaml#/components/responses/404'

'406':

$ref: 'TS29122\_CommonData.yaml#/components/responses/406'

'429':

$ref: 'TS29122\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29122\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29122\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29122\_CommonData.yaml#/components/responses/default'

put:

summary: Request the update of an existing Individual DAA Policy resource.

operationId: UpdateIndDAAPolicy

tags:

- Individual DAA Policy (Document)

requestBody:

required: true

content:

application/json:

schema:

$ref: '#/components/schemas/DAAPolicy'

responses:

'200':

description: >

OK. The Individual DAA Policy resource is successfully updated and a

representation of the updated resource shall be returned in the response body.

content:

application/json:

schema:

$ref: '#/components/schemas/DAAPolicy'

'204':

description: >

No Content. The Individual DAA Policy resource is successfully updated and no

content is returned in the response body.

'307':

$ref: 'TS29122\_CommonData.yaml#/components/responses/307'

'308':

$ref: 'TS29122\_CommonData.yaml#/components/responses/308'

'400':

$ref: 'TS29122\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29122\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29122\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29122\_CommonData.yaml#/components/responses/404'

'406':

$ref: 'TS29122\_CommonData.yaml#/components/responses/406'

'429':

$ref: 'TS29122\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29122\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29122\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29122\_CommonData.yaml#/components/responses/default'

patch:

summary: Request the modification of an existing Individual DAA Policy resource.

operationId: ModifyIndDAAPolicy

tags:

- Individual DAA Policy (Document)

requestBody:

required: true

content:

application/merge-patch+json:

schema:

$ref: '#/components/schemas/DAAPolicyPatch'

responses:

'200':

description: >

OK. The Individual DAA Policy resource is successfully modified and a

representation of the updated resource shall be returned in the response body.

content:

application/json:

schema:

$ref: '#/components/schemas/DAAPolicy'

'204':

description: >

No Content. The Individual DAA Policy resource is successfully modified and no

content is returned in the response body.

'307':

$ref: 'TS29122\_CommonData.yaml#/components/responses/307'

'308':

$ref: 'TS29122\_CommonData.yaml#/components/responses/308'

'400':

$ref: 'TS29122\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29122\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29122\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29122\_CommonData.yaml#/components/responses/404'

'406':

$ref: 'TS29122\_CommonData.yaml#/components/responses/406'

'429':

$ref: 'TS29122\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29122\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29122\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29122\_CommonData.yaml#/components/responses/default'

delete:

summary: Request the deletion of an existing Individual DAA Policy resource.

operationId: DeleteIndDAAPolicy

tags:

- Individual DAA Policy (Document)

responses:

'204':

description: >

No Content. The Individual DAA Policy resource is successfully deleted.

'307':

$ref: 'TS29122\_CommonData.yaml#/components/responses/307'

'308':

$ref: 'TS29122\_CommonData.yaml#/components/responses/308'

'400':

$ref: 'TS29122\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29122\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29122\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29122\_CommonData.yaml#/components/responses/404'

'406':

$ref: 'TS29122\_CommonData.yaml#/components/responses/406'

'429':

$ref: 'TS29122\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29122\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29122\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29122\_CommonData.yaml#/components/responses/default'

/inform-events:

post:

summary: Inform about and request the management of possible DAA related events.

operationId: InformDAAEvents

tags:

- InformDAAEvents

requestBody:

required: true

content:

application/json:

schema:

$ref: '#/components/schemas/InformDAAEventsReq'

responses:

'204':

description: >

No Content. The request is successfully received.

'307':

$ref: 'TS29122\_CommonData.yaml#/components/responses/307'

'308':

$ref: 'TS29122\_CommonData.yaml#/components/responses/308'

'400':

$ref: 'TS29122\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29122\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29122\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29122\_CommonData.yaml#/components/responses/404'

'411':

$ref: 'TS29122\_CommonData.yaml#/components/responses/411'

'413':

$ref: 'TS29122\_CommonData.yaml#/components/responses/413'

'415':

$ref: 'TS29122\_CommonData.yaml#/components/responses/415'

'429':

$ref: 'TS29122\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29122\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29122\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29122\_CommonData.yaml#/components/responses/default'

components:

securitySchemes:

oAuth2ClientCredentials:

type: oauth2

flows:

clientCredentials:

tokenUrl: '{tokenUrl}'

scopes: {}

schemas:

DAAPolReq:

description: >

Represents the parameters to request the creation of a DAA Policy.

type: object

properties:

uassId:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/Uri'

daaPol:

$ref: '#/components/schemas/DAAPolicy'

suppFeat:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/SupportedFeatures'

required:

- uassId

- daaPol

DAAPolResp:

description: Represents the response to a DAA Policy creation request.

type: object

properties:

daaPol:

$ref: '#/components/schemas/DAAPolicy'

suppFeat:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/SupportedFeatures'

required:

- daaPol

DAAPolicy:

description: Represents the content of a DAA Policy.

type: object

properties:

uasId:

$ref: 'TS29257\_UAE\_C2OperationModeManagement.yaml#/components/schemas/UasId'

notifUri:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/Uri'

required:

- uasId

- notifUri

DAAPolicyPatch:

description: >

Represents the parameters to request the modification of a DAA Policy.

type: object

properties:

notifUri:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/Uri'

InformDAAEventsReq:

description: Represents the parameters to report DAA related event(s).

type: object

properties:

uassId:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/Uri'

uasId:

$ref: 'TS29257\_UAE\_C2OperationModeManagement.yaml#/components/schemas/UasId'

daaEventsInfo:

type: array

items:

$ref: '#/components/schemas/DAAEvent'

minItems: 1

suppFeat:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/SupportedFeatures'

required:

- uassId

- uasId

- daaEventsInfo

DAAPolConfigNotif:

description: Represents the parameters to request for DAA.

type: object

properties:

status:

$ref: '#/components/schemas/DAAPolConfigStatus'

required:

- status

DAAEventsInfo:

description: Represents the parameters to request for DAA.

type: object

properties:

uasId:

$ref: 'TS29257\_UAE\_C2OperationModeManagement.yaml#/components/schemas/UasId'

daaEventsInfo:

type: array

items:

$ref: '#/components/schemas/DAAEvent'

minItems: 1

suppFeat:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/SupportedFeatures'

required:

- uasId

- daaEventsInfo

DAAEvent:

description: Represents the parameters to request for DAA.

type: object

properties:

uasId:

$ref: 'TS29257\_UAE\_C2OperationModeManagement.yaml#/components/schemas/UasId'

uasLocInfo:

$ref: 'TS29122\_MonitoringEvent.yaml#/components/schemas/LocationInfo'

required:

- uasId

- uasLocInfo

DAAPolConfigStatus:

anyOf:

- type: string

enum:

- SUCCESSFUL

- NOT\_SUCCESSFUL

- type: string

description: >

This string provides forward-compatibility with future extensions to the enumeration

and is not used to encode content defined in the present version of this API.

description: |

Represents DAA Policy configuration completion status.

Possible values are:

- SUCCESSFUL: Indicates that the DAA Policy configuration was successful.

- NOT\_SUCCESSFUL: Indicates that the DAA Policy configuration was not successful.

Annex B (informative):  
Withdrawn API versions

# B.1 General

This Annex lists withdrawn API versions of the APIs defined in the present specification. Clause 4.3.1.6 of 3GPP TS 29.501 [5] describes the withdrawal of API versions.

# B.2 UAE\_C2OperationModeManagement API

The API versions listed in table B.2-1 are withdrawn for the UAE\_C2OperationModeManagement API.

Table B.2-1: Withdrawn API versions of the UAE\_C2OperationModeManagement service

|  |  |
| --- | --- |
| API version number | Remarks |
|  |  |

# B.3 UAE\_RealtimeUAVStatus API

The API versions listed in table B.3-1 are withdrawn for the UAE\_RealtimeUAVStatus API.

Table B.3-1: Withdrawn API versions of the UAE\_RealtimeUAVStatus service

|  |  |
| --- | --- |
| API version number | Remarks |
|  |  |

# B.4 UAE\_ChangeUSSManagement API

The API versions listed in table B.3-1 are withdrawn for the UAE\_ChangeUSSManagement API.

Table B.3-1: Withdrawn API versions of the UAE\_ChangeUSSManagement service

|  |  |
| --- | --- |
| API version number | Remarks |
|  |  |

# B.5 UAE\_DAASupport API

The API versions listed in table B.3-1 are withdrawn for the UAE\_DAASupport API.

Table B.3-1: Withdrawn API versions of the UAE\_DAASupport service

|  |  |
| --- | --- |
| API version number | Remarks |
|  |  |

Annex C (informative):  
Change history

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Change history** | | | | | | | |
| **Date** | **Meeting** | **TDoc** | **CR** | **Rev** | **Cat** | **Subject/Comment** | **New version** |
| 2021-05 | CT3#116-e |  | - | - | - | Skeleton for the new UASAPP TS | 0.0.0 |
| 2021-05 | CT3#116-e | C3-213503 |  |  |  | Inclusion of C3-213539 | 0.1.0 |
| 2021-09 | CT3#117-e | C3-214619 | - | - | - | Inclusion of: C3-214294, C3-214295, C3-214296,  C3-214297, C3-214487, C3-214299, C3-214300,  C3-214488, C3-214489 | 0.2.0 |
| 2021-10 | CT3#118-e | C3-215478 |  |  |  | Inclusion of: C3-215442, C3-215443, C3-215444,  C3-215445, C3-215446, C3-215447, C3-215448,  C3-215449, C3-215450, C3-215451 | 0.3.0 |
| 2021-11 | CT3#119-e | C3-216551 | - | - | - | Inclusion of: C3-216211, C3-216212, C3-216213,  C3-216214, C3-216215, C3-216216, C3-216217,  C3-216218, C3-216219 | 0.4.0 |
| 2021-12 | CT#94-e | CP-213206 | - | - | - | Presented for information | 1.0.0 |
| 2022-01 | CT3#119-bis-e | C3-220456 |  |  |  | Inclusion of: C3-220308, C3-220309, C3-220310,  C3-220311, C3-220312, C3-220313, C3-220314,  C3-220315 | 1.1.0 |
| 2022-02 | CT3#120-e | C3-221557 |  |  |  | Inclusion of: C3-221342, C3-221343, C3-221344,  C3-221345, C3-221346, C3-221347, C3-221348,  C3-221349, C3-221352, C3-221353, C3-221638,  C3-221639, C3-221640 | 1.2.0 |
| 2022-03 | CT#95e | CP-220162 |  |  |  | Presentation to TSG CT for approval | 2.0.0 |
| 2022-03 | CT#95e | CP-220162 |  |  |  | Approved by TSG CT | 17.0.0 |
| 2022-06 | CT#96 | CP-221160 | 0001 | 1 | F | Correcting the definition of a mandatory attribute in the OpenAPI file | 17.1.0 |
| 2022-06 | CT#96 | CP-221160 | 0002 | 1 | F | Updating the description fields for enumerations in the OpenAPI file | 17.1.0 |
| 2022-06 | CT#96 | CP-221160 | 0003 | 1 | F | Adding a missing reference number | 17.1.0 |
| 2022-06 | CT#96 | CP-221151 | 0004 | - | F | Update of info and externalDocs fields | 17.1.0 |
| 2023-03 | CT#99 | CP-230156 | 0006 | - | F | Correction of the description fields in enumerations | 18.0.0 |
| 2023-03 | CT#99 | CP-230161 | 0007 | - | F | Update of info and externalDocs fields | 18.0.0 |
| 2023-06 | CT#100 | C3-232397 | 0008 | 2 | B | Definition of the service description clauses of the UAE\_ChangeUSSManagement API | 18.1.0 |
| 2023-06 | CT#100 | C3-232398 | 0010 | 2 | B | Definition of the API resources and notifications of the UAE\_ChangeUSSManagement API | 18.1.0 |
| 2023-06 | CT#100 | C3-232399 | 0011 | 1 | B | Definition of the API data model clause of the UAE\_ChangeUSSManagement API | 18.1.0 |
| 2023-06 | CT#100 | C3-231252 | 0012 |  | B | Definition of the OpenAPI description of the UAE\_ChangeUSSManagement API | 18.1.0 |
| 2023-06 | CT#100 | C3-232400 | 0013 | 1 | B | Starting the Definition of the UAE\_DAASupport API | 18.1.0 |
| 2023-06 | CT#100 | C3-232401 | 0014 |  | B | Definition of the API clauses of the UAE\_DAASupport API | 18.1.0 |
| 2023-06 | CT#100 | C3-232402 | 0015 |  | B | Definition of the OpenAPI description of the UAE\_DAASupport API | 18.1.0 |
| 2023-12 | CT#102 | CP-233288 | 0017 | 1 | F | Correct the attributes defined within DAAPolConfigNotif data type. | 18.2.0 |
| 2023-12 | CT#102 | CP-233237 | 0020 |  | F | Update of info and externalDocs fields | 18.2.0 |