|  |  |
| --- | --- |
| 3GPP TS 29.257 V19.0.0 (2024-09) | |
| Technical Specification | |
| 3rd Generation Partnership Project;  Technical Specification Group Core Network and Terminals;  Application layer support for Uncrewed Aerial System (UAS);  UAS Application Enabler (UAE) Server Services;  Stage 3  (Release 19) | |
|  | |
|  | 3GPP-logo_web |
|  | |
| The present document has been developed within the 3rd Generation Partnership Project (3GPP TM) and may be further elaborated for the purposes of 3GPP. The present document has not been subject to any approval process by the 3GPPOrganizational Partners and shall not be implemented. This Specification is provided for future development work within 3GPPonly. The Organizational Partners accept no liability for any use of this Specification. Specifications and Reports for implementation of the 3GPP TM system should be obtained via the 3GPP Organizational Partners' Publications Offices. | |

|  |
| --- |
|  |
| ***3GPP***  Postal address  3GPP support office address  650 Route des Lucioles - Sophia Antipolis  Valbonne - FRANCE  Tel.: +33 4 92 94 42 00 Fax: +33 4 93 65 47 16  Internet  http://www.3gpp.org |
| ***Copyright Notification***  No part may be reproduced except as authorized by written permission. The copyright and the foregoing restriction extend to reproduction in all media.  © 2024, 3GPP Organizational Partners (ARIB, ATIS, CCSA, ETSI, TSDSI, TTA, TTC).  All rights reserved.  UMTS™ is a Trade Mark of ETSI registered for the benefit of its members  3GPP™ is a Trade Mark of ETSI registered for the benefit of its Members and of the 3GPP Organizational Partners LTE™ is a Trade Mark of ETSI registered for the benefit of its Members and of the 3GPP Organizational Partners  GSM® and the GSM logo are registered and owned by the GSM Association |

Contents

Foreword 11

1 Scope 13

2 References 13

3 Definitions, symbols and abbreviations 14

3.1 Definitions 14

3.2 Symbols 14

3.3 Abbreviations 14

4 Overview 15

5 Services offered by the UAE Server 16

5.1 Introduction 16

5.2 UAE\_C2OperationModeManagement Service 16

5.2.1 Service Description 16

5.2.2 Service Operations 17

5.2.2.1 Introduction 17

5.2.2.2 UAE\_C2OperationModeManagement\_Initiate 17

5.2.2.2.1 General 17

5.2.2.2.2 C2 Operation Mode Initiation 17

5.2.2.3 UAE\_C2OperationModeManagement\_Notify 18

5.2.2.3.1 General 18

5.2.2.3.2 C2 Operation Mode Management Completion Notification 18

5.2.2.3.3 Selected C2 Communication Mode Notification 19

5.2.2.3.4 C2 Communication Mode Switching Notification 20

5.3 UAE\_RealtimeUAVStatus Service 21

5.3.1 Service Description 21

5.3.2 Service Operations 21

5.3.2.1 Introduction 21

5.3.2.2 UAE\_RealtimeUAVStatus\_Subscribe 21

5.3.2.2.1 General 21

5.3.2.2.2 Subscribe to real-time UAV status information reporting 21

5.3.2.2.3 Update an existing real-time UAV status information reporting subscription 22

5.3.2.3 UAE\_RealtimeUAVStatus\_Unsubscribe 23

5.3.2.3.1 General 23

5.3.2.3.2 Unsubscribe from real-time UAV status information reporting 23

5.3.2.4 UAE\_RealtimeUAVStatus\_Notify 24

5.3.2.4.1 General 24

5.3.2.4.2 Real-time UAV Status Notification 24

5.4 UAE\_ChangeUSSManagement Service 25

5.4.1 Service Description 25

5.4.2 Service Operations 25

5.4.2.1 Introduction 25

5.4.2.2 UAE\_ChangeUSSManagement\_ManageUSS 25

5.4.2.2.1 General 25

5.4.2.2.2 USS Change Policy Creation 25

5.4.2.2.3 USS Change Policy Update 26

5.4.2.2.4 USS Change Policy Deletion 27

5.4.2.3 UAE\_ChangeUSSManagement\_RequestUSSChange 27

5.4.2.3.1 General 27

5.4.2.3.2 USS Change Request 27

5.4.2.4 UAE\_ChangeUSSManagement\_Notify 28

5.4.2.4.1 General 28

5.4.2.4.2 USS Change Notification 28

5.5 UAE\_DAASupport Service 30

5.5.1 Service Description 30

5.5.2 Service Operations 30

5.5.2.1 Introduction 30

5.5.2.2 UAE\_DAASupport\_Manage 30

5.5.2.2.1 General 30

5.5.2.2.2 DAA Policy Creation 30

5.5.2.2.3 DAA Policy Update 31

5.5.2.2.4 DAA Policy Deletion 32

5.5.2.3 UAE\_DAASupport\_InformDAAEvents 32

5.5.2.3.1 General 32

5.5.2.3.2 DAA Events Information Request 32

5.5.2.4 UAE\_DAASupport\_Notify 33

5.5.2.4.1 General 33

5.5.2.4.2 DAA Policy Configuration Completion Status Notification 33

5.5.2.4.3 DAA Events Notification 34

5.6 UAE\_UAVDynamicInfo 35

5.6.1 Service Description 35

5.6.2 Service Operations 35

5.6.2.1 Introduction 35

5.6.2.2 UAE\_UAVDynamicInfo\_Subscribe 35

5.6.2.2.1 General 35

5.6.2.2.2 UAV Dynamic Information Subscription Creation 35

5.6.2.2.3 UAV Dynamic Information Subscription Update 36

5.6.2.2.4 UAV Dynamic Information Subscription Deletion 36

5.6.2.3 UAE\_UAVDynamicInfo\_Notify 37

5.6.2.3.1 General 37

5.6.2.3.2 UAV Dynamic Information Notification 37

5.7 UAE\_FlightPathMonitoring Service 39

5.7.1 Service Description 39

5.7.2 Service Operations 39

5.7.2.1 Introduction 39

5.7.2.2 UAE\_FlightPathMonitoring\_Manage 39

5.7.2.2.1 General 39

5.7.2.2.2 Flight Path Monitoring Configuration Creation 39

5.7.2.2.3 Flight Path Monitoring Configuration Update 40

5.7.2.2.4 Flight Path Monitoring Configuration Deletion 41

5.7.2.3 UAE\_FlightPathMonitoring\_Notify 41

5.7.2.3.1 General 41

5.7.2.3.2 Flight Path Monitoring Configuration Completion Status Notification 41

5.7.2.3.3 Flight Path Monitoring Events Notification 42

5.8 UAE\_FlightRouteSupport Service 44

5.8.1 Service Description 44

5.8.2 Service Operations 44

5.8.2.1 Introduction 44

5.8.2.2 UAE\_FlightRouteSupport\_Manage 44

5.8.2.2.1 General 44

5.8.2.2.2 Flight Route Request 44

6 API Definitions 46

6.1 UAE\_C2OperationModeManagement Service API 46

6.1.1 Introduction 46

6.1.2 Usage of HTTP 46

6.1.3 Resources 46

6.1.4 Custom Operations without associated resources 46

6.1.4.1 Overview 46

6.1.4.2 Operation: Initiate 47

6.1.4.2.1 Description 47

6.1.4.2.2 Operation Definition 47

6.1.5 Notifications 48

6.1.5.1 General 48

6.1.5.2 C2 Operation Mode Management Completion Notification 49

6.1.5.2.1 Description 49

6.1.5.2.2 Target URI 49

6.1.5.2.3 Standard Methods 49

6.1.5.2.3.1 POST 49

6.1.5.3 Selected C2 Communication Mode Notification 50

6.1.5.3.1 Description 50

6.1.5.3.2 Target URI 50

6.1.5.3.3 Standard Methods 51

6.1.5.3.3.1 POST 51

6.1.5.4 C2 Communication Mode Switching Notification 51

6.1.5.4.1 Description 51

6.1.5.4.2 Target URI 52

6.1.5.4.3 Standard Methods 52

6.1.5.4.3.1 POST 52

6.1.6 Data Model 53

6.1.6.1 General 53

6.1.6.2 Structured data types 54

6.1.6.2.1 Introduction 54

6.1.6.2.2 Type: ConfigureData 55

6.1.6.2.3 Type: SelectedC2CommModeNotif 58

6.1.6.2.4 Type: C2CommModeSwitchNotif 58

6.1.6.2.5 Type: C2Result 59

6.1.6.2.6 Type: UasId 59

6.1.6.2.7 Type: UavId 59

6.1.6.2.8 Type: C2ServiceArea 60

6.1.6.2.9 Type: C2OpModeMngtCompStatus 60

6.1.6.2.10 Type: C2SwitchPolicies 60

6.1.6.2.11 Type: C2LinkQualityThrlds 61

6.1.6.2.12 Type: C2DirectAvailRepReqs 62

6.1.6.2.13 Type: DualC2Data 62

6.1.6.3 Simple data types and enumerations 62

6.1.6.3.1 Introduction 62

6.1.6.3.2 Simple data types 62

6.1.6.3.3 Enumeration: C2CommMode 63

6.1.6.3.4 Enumeration: C2CommModeSwitching 63

6.1.6.3.5 Enumeration: C2SwitchingCause 64

6.1.6.3.6 Enumeration: C2OpModeStatus 64

6.1.6.4 Data types describing alternative data types or combinations of data types 64

6.1.6.5 Binary data 65

6.1.6.5.1 Binary Data Types 65

6.1.7 Error Handling 65

6.1.7.1 General 65

6.1.7.2 Protocol Errors 65

6.1.7.3 Application Errors 65

6.1.8 Feature negotiation 65

6.1.9 Security 66

6.2 UAE\_RealtimeUAVStatus Service API 67

6.2.1 Introduction 67

6.2.2 Usage of HTTP 67

6.2.3 Resources 67

6.2.3.1 Overview 67

6.2.3.2 Resource: Real-time UAV Status Subscriptions 68

6.2.3.2.1 Description 68

6.2.3.2.2 Resource Definition 68

6.2.3.2.3 Resource Standard Methods 68

6.2.3.2.3.1 GET 68

6.2.3.2.3.2 POST 69

6.2.3.2.4 Resource Custom Operations 70

6.2.3.3 Resource: Individual Real-time UAV Status Subscription 70

6.2.3.3.1 Description 70

6.2.3.3.2 Resource Definition 70

6.2.3.3.3 Resource Standard Methods 70

6.2.3.3.3.1 GET 70

6.2.3.3.3.2 PUT 71

6.2.3.3.3.3 DELETE 72

6.2.3.3.4 Resource Custom Operations 73

6.2.4 Custom Operations without associated resources 73

6.2.5 Notifications 74

6.2.5.1 General 74

6.2.5.2 Real-time UAV Status Notification 74

6.2.5.2.1 Description 74

6.2.5.2.2 Target URI 74

6.2.5.2.3 Standard Methods 74

6.2.5.2.3.1 POST 74

6.2.6 Data Model 75

6.2.6.1 General 75

6.2.6.2 Structured data types 76

6.2.6.2.1 Introduction 76

6.2.6.2.2 Type: RTUavStatusSubsc 76

6.2.6.2.3 Type: RTUavStatusNotif 76

6.2.6.2.4 Type: RTUavStatus 77

6.2.6.2.5 Type: UavNetConnStatus 77

6.2.6.3 Simple data types and enumerations 77

6.2.6.3.1 Introduction 77

6.2.6.3.2 Simple data types 77

6.2.6.4 Data types describing alternative data types or combinations of data types 77

6.2.6.5 Binary data 78

6.2.6.5.1 Binary Data Types 78

6.2.7 Error Handling 78

6.2.7.1 General 78

6.2.7.2 Protocol Errors 78

6.2.7.3 Application Errors 78

6.2.8 Feature negotiation 78

6.2.9 Security 78

6.3 UAE\_ChangeUSSManagement Service API 79

6.3.1 Introduction 79

6.3.2 Usage of HTTP 79

6.3.3 Resources 79

6.3.3.1 Overview 79

6.3.3.2 Resource: USS Change Policies 80

6.3.3.2.1 Description 80

6.3.3.2.2 Resource Definition 80

6.3.3.2.3 Resource Standard Methods 80

6.3.3.2.3.1 GET 80

6.3.3.2.3.2 POST 81

6.3.3.2.4 Resource Custom Operations 82

6.3.3.3 Resource: Individual USS Change Policy 82

6.3.3.3.1 Description 82

6.3.3.3.2 Resource Definition 82

6.3.3.3.3 Resource Standard Methods 82

6.3.3.3.3.1 GET 82

6.3.3.3.3.2 PUT 83

6.3.3.3.3.3 PATCH 84

6.3.3.3.3.4 DELETE 86

6.3.3.3.4 Resource Custom Operations 86

6.3.4 Custom Operations without associated resources 87

6.3.4.1 Overview 87

6.3.4.2 Operation: RequestUssChange 87

6.3.4.2.1 Description 87

6.3.4.2.2 Operation Definition 87

6.3.5 Notifications 88

6.3.5.1 General 88

6.3.5.2 USS Change Notification 88

6.3.5.2.1 Description 88

6.3.5.2.2 Target URI 89

6.3.5.2.3 Standard Methods 89

6.3.5.2.3.1 POST 89

6.3.6 Data Model 90

6.3.6.1 General 90

6.3.6.2 Structured data types 91

6.3.6.2.1 Introduction 91

6.3.6.2.2 Type: USSChangePolReq 91

6.3.6.2.3 Type: USSChangePolResp 91

6.3.6.2.4 Type: USSChangePolicy 92

6.3.6.2.5 Type: USSChangePolicyPatch 92

6.3.6.2.6 Type: MultiUssPol 92

6.3.6.2.7 Type: ServArea 93

6.3.6.2.8 Type: UasRoute 93

6.3.6.2.9 Type: UssInfo 93

6.3.6.2.10 Type: ServReq 93

6.3.6.2.11 Type: USSChangeReq 94

6.3.6.2.12 Type: TgtUssInfo 94

6.3.6.2.13 Type: USSChangeNotif 95

6.3.6.2.14 Type: UssChgInfo 95

6.3.6.3 Simple data types and enumerations 95

6.3.6.3.1 Introduction 95

6.3.6.3.2 Simple data types 95

6.3.6.3.3 Enumeration: UssChangeEvent 96

6.3.6.3.4 Enumeration: MobilityEvent 96

6.3.6.4 Data types describing alternative data types or combinations of data types 96

6.3.6.5 Binary data 96

6.3.6.5.1 Binary Data Types 96

6.3.7 Error Handling 96

6.3.7.1 General 96

6.3.7.2 Protocol Errors 97

6.3.7.3 Application Errors 97

6.3.8 Feature negotiation 97

6.3.9 Security 97

6.4 UAE\_DAASupport Service API 98

6.4.1 Introduction 98

6.4.2 Usage of HTTP 98

6.4.3 Resources 98

6.4.3.1 Overview 98

6.4.3.2 Resource: DAA Policies 99

6.4.3.2.1 Description 99

6.4.3.2.2 Resource Definition 99

6.4.3.2.3 Resource Standard Methods 99

6.4.3.2.3.1 GET 99

6.4.3.2.3.2 POST 100

6.4.3.2.4 Resource Custom Operations 101

6.4.3.3 Resource: Individual DAA Policy 101

6.4.3.3.1 Description 101

6.4.3.3.2 Resource Definition 101

6.4.3.3.3 Resource Standard Methods 101

6.4.3.3.3.1 GET 101

6.4.3.3.3.2 PUT 102

6.4.3.3.3.3 PATCH 103

6.4.3.3.3.4 DELETE 104

6.4.3.3.4 Resource Custom Operations 105

6.4.4 Custom Operations without associated resources 105

6.4.4.1 Overview 105

6.4.4.2 Operation: InformDAAEvents 106

6.4.4.2.1 Description 106

6.4.4.2.2 Operation Definition 106

6.4.5 Notifications 107

6.4.5.1 General 107

6.4.5.2 DAA Policy Configuration Completion Status Notification 108

6.4.5.2.1 Description 108

6.4.5.2.2 Target URI 108

6.4.5.2.3 Standard Methods 108

6.4.5.2.3.1 POST 108

6.4.5.3 DAA Events Notification 109

6.4.5.3.1 Description 109

6.4.5.3.2 Target URI 109

6.4.5.3.3 Standard Methods 109

6.4.5.3.3.1 POST 109

6.4.6 Data Model 110

6.4.6.1 General 110

6.4.6.2 Structured data types 111

6.4.6.2.1 Introduction 111

6.4.6.2.2 Type: DAAPolReq 111

6.4.6.2.3 Type: DAAPolResp 112

6.4.6.2.4 Type: DAAPolicy 112

6.4.6.2.5 Type: DAAPolicyPatch 113

6.4.6.2.6 Type: DAAAppPolicy 113

6.4.6.2.7 Type: InformDAAEventsReq 114

6.4.6.2.8 Type: DAAPolConfigNotif 114

6.4.6.2.9 Type: DAAEventsInfo 114

6.4.6.2.10 Type: DAAEvent 115

6.4.6.3 Simple data types and enumerations 115

6.4.6.3.1 Introduction 115

6.4.6.3.2 Simple data types 115

6.4.6.3.3 Enumeration: DAAPolConfigStatus 115

6.4.6.3.4 Enumeration: Alert 115

6.4.6.4 Data types describing alternative data types or combinations of data types 116

6.4.6.5 Binary data 116

6.4.6.5.1 Binary Data Types 116

6.4.7 Error Handling 116

6.4.7.1 General 116

6.4.7.2 Protocol Errors 116

6.4.7.3 Application Errors 116

6.4.8 Feature negotiation 116

6.4.9 Security 117

6.5 UAE\_UAVDynamicInfo API 118

6.5.1 Introduction 118

6.5.2 Usage of HTTP 118

6.5.3 Resources 118

6.5.3.1 Overview 118

6.5.3.2 Resource: UAV Dynamic Information Subscriptions 119

6.5.3.2.1 Description 119

6.5.3.2.2 Resource Definition 119

6.5.3.2.3 Resource Standard Methods 119

6.5.3.2.3.1 GET 119

6.5.3.2.3.2 POST 120

6.5.3.2.4 Resource Custom Operations 121

6.5.3.3 Resource: Individual UAV Dynamic Information Subscription 121

6.5.3.3.1 Description 121

6.5.3.3.2 Resource Definition 121

6.5.3.3.3 Resource Standard Methods 122

6.5.3.3.3.1 GET 122

6.5.3.3.3.2 PUT 123

6.5.3.3.3.3 PATCH 124

6.5.3.3.3.4 DELETE 125

6.5.3.3.4 Resource Custom Operations 126

6.5.4 Custom Operations without associated resources 126

6.5.5 Notifications 126

6.5.5.1 General 126

6.5.5.2 UAV Dynamic Information Notification 126

6.5.5.2.1 Description 126

6.5.5.2.2 Target URI 126

6.5.5.2.3 Standard Methods 127

6.5.5.2.3.1 POST 127

6.5.6 Data Model 127

6.5.6.1 General 127

6.5.6.2 Structured data types 128

6.5.6.2.1 Introduction 128

6.5.6.2.2 Type: UAVDynInfoSubsc 128

6.5.6.2.3 Type: UAVDynInfoSubscPatch 129

6.5.6.2.4 Type: UAVDynInfoNotif 129

6.5.6.2.5 Type: ProxRangInfo 129

6.5.6.2.6 Type: UavInfo 129

6.5.6.3 Simple data types and enumerations 130

6.5.6.3.1 Introduction 130

6.5.6.3.2 Simple data types 130

6.5.6.4 Data types describing alternative data types or combinations of data types 130

6.5.6.5 Binary data 130

6.5.6.5.1 Binary Data Types 130

6.5.7 Error Handling 130

6.5.7.1 General 130

6.5.7.2 Protocol Errors 130

6.5.7.3 Application Errors 130

6.5.8 Feature negotiation 131

6.5.9 Security 131

6.6 UAE\_FlightPathMonitoring Service API 132

6.6.1 Introduction 132

6.6.2 Usage of HTTP 132

6.6.3 Resources 132

6.6.3.1 Overview 132

6.6.3.2 Resource: Flight Path Monitoring Configurations 133

6.6.3.2.1 Description 133

6.6.3.2.2 Resource Definition 133

6.6.3.2.3 Resource Standard Methods 133

6.6.3.2.3.1 GET 133

6.6.3.2.3.2 POST 134

6.6.3.2.4 Resource Custom Operations 135

6.6.3.3 Resource: Individual Flight Path Monitoring Configuration 135

6.6.3.3.1 Description 135

6.6.3.3.2 Resource Definition 135

6.6.3.3.3 Resource Standard Methods 136

6.6.3.3.3.1 GET 136

6.6.3.3.3.2 PUT 137

6.6.3.3.3.3 PATCH 138

6.6.3.3.3.4 DELETE 139

6.6.3.3.4 Resource Custom Operations 140

6.6.4 Custom Operations without associated resources 140

6.6.5 Notifications 140

6.6.5.1 General 140

6.6.5.2 Flight Path Monitoring Configuration Completion Status Notification 140

6.6.5.2.1 Description 140

6.6.5.2.2 Target URI 140

6.6.5.2.3 Standard Methods 141

6.6.5.2.3.1 POST 141

6.6.5.3 Flight Path Monitoring Events Notification 142

6.6.5.3.1 Description 142

6.6.5.3.2 Target URI 142

6.6.5.3.3 Standard Methods 142

6.6.5.3.3.1 POST 142

6.6.6 Data Model 143

6.6.6.1 General 143

6.6.6.2 Structured data types 144

6.6.6.2.1 Introduction 144

6.6.6.2.2 Type: FlightPathMonConfigReq 144

6.6.6.2.3 Type: FlightPathMonConfigResp 144

6.6.6.2.4 Type: FlightPathMonConfig 145

6.6.6.2.5 Type: FlightPathMonConfigPatch 145

6.6.6.2.6 Type: FlightPathMonConfigParams 146

6.6.6.2.7 Type: FlightPathMonConfigParamsRm 146

6.6.6.2.8 Type: Waypoint 147

6.6.6.2.9 Type: FlightPathMonConfigNotif 147

6.6.6.2.10 Type: FlightPathMonNotif 147

6.6.6.2.11 Type: FlightPathMonEventInfo 147

6.6.6.3 Simple data types and enumerations 148

6.6.6.3.1 Introduction 148

6.6.6.3.2 Simple data types 148

6.6.6.3.3 Enumeration: FlightPathMonConfigStatus 148

6.6.6.3.4 Enumeration: FlightPathMonEvent 148

6.6.6.4 Data types describing alternative data types or combinations of data types 148

6.6.6.5 Binary data 148

6.6.6.5.1 Binary Data Types 148

6.6.7 Error Handling 149

6.6.7.1 General 149

6.6.7.2 Protocol Errors 149

6.6.7.3 Application Errors 149

6.6.8 Feature negotiation 149

6.6.9 Security 149

6.7 UAE\_FlightRouteSupport Service API 150

7 Using Common API Framework 151

7.1 General 151

7.2 Security 151

Annex A (normative): OpenAPI specification 152

A.1 General 152

A.2 UAE\_C2OperationModeManagement API 153

A.3 UAE\_RealtimeUAVStatus API 161

A.4 UAE\_ChangeUSSManagement API 166

A.5 UAE\_DAASupport API 175

A.6 UAE\_UAVDynamicInfo API 184

A.7 UAE\_FlightPathMonitoring API 190

A.8 UAE\_FlightRouteSupport API 199

Annex B (informative): Withdrawn API versions 200

B.1 General 200

B.2 UAE\_C2OperationModeManagement API 200

B.3 UAE\_RealtimeUAVStatus API 200

B.4 UAE\_ChangeUSSManagement API 200

B.5 UAE\_DAASupport API 200

B.6 UAE\_UAVDynamicInfo API 201

B.7 UAE\_FlightPathMonitoring API 202

B.8 UAE\_FlightRouteSupport API 203

Annex C (informative): Change history 204

# 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:

Version x.y.z

where:

x the first digit:

1 presented to TSG for information;

2 presented to TSG for approval;

3 or greater indicates TSG approved document under change control.

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

z the third digit is incremented when editorial only changes have been incorporated in the document.

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".

[13] 3GPP TS 29.558: "Enabling Edge Applications; Application Programming Interface (API) specification; Stage 3".

[14] 3GPP TS 29.523: "5G System; Policy Control Event Exposure Service; Stage 3".

[15] 3GPP TS 29.555: "5G System; 5G Direct Discovery Name Management Services; Stage 3".

# 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.

**Topological area:** Refers to to an area/location information that is expressed in the form of a collection of network topology based area/location information (e.g., list of tracking area(s) and/or list of cell(s)) using the corresponding identifiers (e.g., list of TAIs and/or list of cell IDs).

## 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

LDGS Local DAA Ground Station

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

LUN Local USS Network

# 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;

- DAA management;

- UAV dynamic information management;

- real-time UAV flight path monitoring assistance management; and

- UAS provided flight routes 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

- UAE\_UAVDynamicInfo

- UAE\_FlightPathMonitoring

- UAE\_FlightRouteSupport

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 Server USS Change Management Service | TS29257\_UAE\_ChangeUSSManagement.yaml | uae-ucm | A.4 |
| UAE\_DAASupport | 5.5 | UAE Server DAA Support Service | TS29257\_UAE\_DAASupport.yaml | uae-daa | A.5 |
| UAE\_UAVDynamicInfo | 5.6 | UAE Server UAV Dynamic Information Service | TS29257\_UAE\_UAVDynamicInfo.yaml | uae-udi | A.6 |
| UAE\_FlightPathMonitoring | 5.7 | UAE Server Flight Path Monitoring Service | TS29257\_UAE\_FlightPathMonitoring.yaml | uae-fpm | A.7 |
| UAE\_UAE\_FlightRouteSupport | 5.8 | UAE Server Flight Route Support Service | TS29257\_UAE\_FlightRouteSupport.yaml | uae-frs | A.8 |

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 service consumer 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 service consumer 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 service consumer 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 service consumer 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 service consumer 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 service consumer 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.

##### 5.2.2.2.2 C2 Operation Mode Initiation

Figure 5.2.2.2.2-1 depicts a scenario where a service consumer 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 service consumer 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.

2a. Upon success, the UAE Server shall respond with an HTTP "200 OK" status code with the response body including the feedback from the UAE Server within the C2Result 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 6.1.7.

#### 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 service consumer 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 service consumer may then confirm the targeted C2 communication mode switching or not.

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 service consumer 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 service consumer with the request URI set to "{notificationUri}/c2mode-mngt-completion", where the "notificationUri" variable is set to the value received from the service consumer during the C2 Operation Mode Initiation procedure defined in clause 5.2.2.2, and the request body including the C2OpModeMngtCompStatus data structure.

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

If the service consumer 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 service consumer towards which 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, as specified in clause 6.1.7.

##### 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 service consumer 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 service consumer with the request URI set to "{notificationUri}/inform-selec-c2mode", where the "notificationUri" variable is set to the value received from the service consumer during the C2 Operation Mode Initiation procedure defined in clause 5.2.2.2, and the request body including the SelectedC2CommModeNotif data structure.

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

If the service consumer 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 service consumer towards which 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, as specified in clause 6.1.7.

##### 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 service consumer on the targeted C2 communication mode switching for a UAS (i.e., pair of UAV and UAV-C) and may request confirmation from the service consumer. 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 service consumer with the request URI set to "{notificationUri}/inform-c2mode-switch", where the "notificationUri" is set to the value received from the service consumer during the C2 Operation Mode Initiation procedure defined in clause 5.2.2.2, and the request body including the C2CommModeSwitchNotif data structure.

2a. Upon success:

- if the service consumer has to confirm (i.e., approve) the C2 Communication Mode switching operation to the UAE Server, the service consumer shall respond with an HTTP "200 OK" status code with the response body including the feedback from the service consumer within the C2Result data structure.; and

- otherwise, if the service consumer does not have to confirm (i.e., approve) the C2 Communication Mode switching operation to the UAE Server, the service consumer shall respond to the UAE Server with an HTTP "204 No Content" status code to acknowledge the successful reception of the notification.

If the service consumer 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 service consumer towards which 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, as specified in clause 6.1.7.

## 5.3 UAE\_RealtimeUAVStatus Service

### 5.3.1 Service Description

The UAE\_RealtimeUAVStatus service exposed by the UAE Server enables a service consumer 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 service consumer 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 service consumer 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 service consumer 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 service consumer 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 service consumer 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 service consumer 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 service consumer 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 service consumer desires to receive real-time UAV status notifications from the UAE Server, within the "notificationUri" attribute; and

- the list of features supported by the service consumer 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 service consumer 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 service consumer 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 service consumer that is sending the request, within the "uassId" attribute;

NOTE: An alternative service consumer 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 service consumer 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 service consumer 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 service consumer 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 service consumer 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 service consumer 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 service consumer 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 service consumer with the request URI set to "{notificationUri}/uav-status", where the "notificationUri" is set to the value received from the service consumer 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 service consumer shall respond with an HTTP "204 No Content" status code to acknowledge the reception of the notification to the UAE Server.

If the service consumer 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 service consumer 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 service consumer to:

- create/update/delete USS Change Policy(ies);

- request USS change; and

- receive notifications on USS Change related event(s).

### 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 service consumer to create/update/delete a USS Change Policy. | e.g., UASS |
| UAE\_ChangeUSSManagement\_RequestUSSChange | This service operation enables a service consumer to trigger USS change. | e.g., UASS |
| UAE\_ChangeUSSManagement\_Notify | This service operation enables a UAE Server to notify a previously subscribed service consumer on USS Change related event(s). | UAE Server |

#### 5.4.2.2 UAE\_ChangeUSSManagement\_ManageUSS

##### 5.4.2.2.1 General

This service operation is used by a service consumer 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 service consumer 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 service consumer 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 5.4.2.2.3-1 depicts a scenario where a service consumer 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 service consumer shall send an HTTP PUT/PATCH request to the UAE Server targeting the corresponding "Individual USS Change Policy" resource, with the request body including either:

- the updated representation of the resource within the USSChangePolicy data structure, in case the HTTP PUT method is used; or

- the requested modifications to the resource within the USSChangePolicyPatch data structure, in case the HTTP PATCH method is used.

NOTE: An alternative service consumer (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 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.

##### 5.4.2.2.4 USS Change Policy Deletion

Figure 5.4.2.2.4-1 depicts a scenario where a service consumer 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 5.4.2.2.4-1: Procedure for USS Change Policy Deletion

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

NOTE: An alternative service consumer (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 service consumer 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 service consumer 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 service consumer shall send an HTTP POST request (custom operation: "RequestUssChange") to the UAE Server, with the request URI set to "{apiRoot}/uae-ucm/<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 service consumer on USS Change event(s).

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

- USS Change Notification.

##### 5.4.2.4.2 USS Change Notification

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



Figure 5.4.2.4.2-1: USS Change Notification procedure

1. In order to notify a service consumer on USS Change event(s), the UAE Server shall send an HTTP POST request to the service consumer with the request URI set to "{notifUri}", where the "notifUri" variable is set to the value received from the service consumer during the corresponding USS Change Policy Creation/Update procedure defined in clause 5.4.2.2, and the request body including the USSChangeNotif data structure.

If the service consumer 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 service consumer towards which the notification should be sent, as defined in clause 5.2.10 of 3GPP TS 29.122 [2].

2a. Upon success, the service consumer 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 service consumer to:

- create/update/delete DAA Policies;

- receive DAA Policy Configuration Completion Status notifications;

- receive DAA Events 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 service consumer to create/update/delete a DAA Application Policy. | e.g. UASS |
| UAE\_DAASupport\_InformDAAEvents | This service operation enables a service consumer 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 service consumer either:  - on DAA Policy Configuration Completion Status; or  - on detected DAA related events. | UAE Server |

#### 5.5.2.2 UAE\_DAASupport\_Manage

##### 5.5.2.2.1 General

This service operation is used by a service consumer 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 service consumer 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 service consumer shall send an HTTP POST request to the UAE Server targeting the "DAA Policies" collection 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 5.5.2.2.3-1 depicts a scenario where a service consumer 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 service consumer shall send an HTTP PUT/PATCH request to the UAE Server targeting the corresponding "Individual DAA Policy" resource, with the request body including either:

- the updated representation of the resource within the DAAPolicy data structure, in case the HTTP PUT method is used; or

- the requested modifications to the resource within the DAAPolicyPatch data structure, in case the HTTP PATCH method is used.

NOTE: An alternative service consumer (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 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.

##### 5.5.2.2.4 DAA Policy Deletion

Figure 5.5.2.2.4-1 depicts a scenario where a service consumer 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 5.5.2.2.4-1: Procedure for DAA Policy Deletion

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

NOTE: An alternative service consumer (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\_InformDAAEvents

##### 5.5.2.3.1 General

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

The following procedures are supported by the "UAE\_DAASupport\_InformDAAEvents" 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 service consumer 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 service consumer 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 service consumer 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 Events 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 service consumer 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 service consumer on the status of DAA Policy Configuration, the UAE Server shall send an HTTP POST request to the service consumer with the request URI set to "{notifUri}/daa-policy", where the "notifUri" variable is set to the value received from the service consumer 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 service consumer 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 service consumer where the notification should be sent, as defined in clause 5.2.10 of 3GPP TS 29.122 [2].

2a. Upon success, the service consumer 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 Events Notification

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



Figure 5.5.2.4.3-1: DAA Events Notification procedure

1. In order to notify a service consumer on the detected DAA event(s), the UAE Server shall send an HTTP POST request to the service consumer with the request URI set to "{notifUri}/daa-events", where the "notifUri" variable is set to the value received from the service consumer 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 service consumer 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 service consumer where the notification should be sent, as defined in clause 5.2.10 of 3GPP TS 29.122 [2].

2a. Upon success, the service consumer 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 service consumer 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 service consumer 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.

## 5.6 UAE\_UAVDynamicInfo

### 5.6.1 Service Description

The UAE\_UAVDynamicInfo service exposed by the UAE Server enables a service consumer to:

- create/update/delete a UAV dynamic information subscription; and

- receive UAV dynamic information event(s) related notifications.

### 5.6.2 Service Operations

#### 5.6.2.1 Introduction

The service operations defined for the UAE\_UAVDynamicInfo service are shown in table 5.6.2.1-1.

Table 5.6.2.1-1: UAE\_UAVDynamicInfo Service Operations

|  |  |  |
| --- | --- | --- |
| Service Operation Name | Description | Initiated by |
| UAE\_UAVDynamicInfo\_Subscribe | This service operation enables a service consumer to request the creation/update/deletion of a UAV Dynamic Information Subscription at the UAE Server. | e.g., UASS |
| UAE\_UAVDynamicInfo\_Notify | This service operation enables a service consumer to receive UAV dynamic information event(s) related notifications from the UAE Server. | UAE Server |

#### 5.6.2.2 UAE\_UAVDynamicInfo\_Subscribe

##### 5.6.2.2.1 General

This service operation is used by a service consumer to request the creation/update/deletion of a UAV dynamic information subscription at the UAE Server.

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

- UAV Dynamic Information Subscription Creation.

- UAV Dynamic Information Subscription Update.

- UAV Dynamic Information Subscription Deletion.

##### 5.6.2.2.2 UAV Dynamic Information Subscription Creation

Figure 5.6.2.2.2-1 depicts a scenario where a a service consumer sends a request to the UAE Server to request the creation of a UAV Dynamic Information Subscription (see also clause 7.8 of 3GPP°TS°23.255°[6]).

 Figure 5.6.2.2.2-1: Procedure for UAV Dynamic Information Subscription Creation

1. In order to create a UAV Dynamic Information Subscription, the service consumer shall send an HTTP POST request to the UAE Server targeting the URI of the "UAV Dynamic Information Subscriptions" collection resource, with the request body including the UAVDynInfoSubsc 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 UAV Dynamic Information Subscription" resource within the UAVDynInfoSubsc data structure, and an HTTP "Location" header field containing the URI of the created resource.

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 6.5.7.

##### 5.6.2.2.3 UAV Dynamic Information Subscription Update

Figure 5.6.2.2.3-1 depicts a scenario where a service consumer sends a request to the UAE Server to request the update of an existing UAV Dynamic Information Subscription (see also clause 7.8 of 3GPP°TS°23.255°[6]).



Figure 5.6.2.2.3-1: Procedure for UAV Dynamic Information Subscription Update

1. In order to request the update of an existing UAV Dynamic Information Subscription, the service consumer shall send an HTTP PUT/PATCH request to the UAE Server, targeting the URI of the corresponding "Individual UAV Dynamic Information Subscription" resource, with the request body including either:

- the updated representation of the resource within the UAVDynInfoSubsc data structure, in case the HTTP PUT method is used; or

- the requested modifications to the resource within the UAVDynInfoSubscPatch data structure, in case the HTTP PATCH method is used.

NOTE: An alternative service consumer (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 update the targeted "Individual UAV Dynamic Information Subscription" resource accordingly and respond with either:

- an HTTP "200 OK" status code with the response body containing a representation of the updated "Individual UAV Dynamic Information Subscription" resource within the UAVDynInfoSubsc 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 6.5.7.

##### 5.6.2.2.4 UAV Dynamic Information Subscription Deletion

Figure 5.6.2.2.4-1 depicts a scenario where a service consumer sends a request to the UAE Server to request the deletion of an existing UAV Dynamic Information Subscription (see also clause 7.8 of 3GPP°TS°23.255°[6]).



Figure 5.6.2.2.4-1: Procedure for UAV Dynamic Information Subscription Deletion

1. In order to request the deletion of an existing UAV Dynamic Information Subscription, the service consumer shall send an HTTP DELETE request to the UAE Server targeting the corresponding "Individual UAV Dynamic Information Subscription" resource.

NOTE: An alternative service consumer (i.e. other than the one that requested the creation/update 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 6.5.7.

#### 5.6.2.3 UAE\_UAVDynamicInfo\_Notify

##### 5.6.2.3.1 General

This service operation is used by a UAE Server to notify a previously subscribed service consumer on:

- UAV dynamic information event(s).

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

- UAV Dynamic Information Notification.

##### 5.6.2.3.2 UAV Dynamic Information Notification

Figure 5.6.2.3.2-1 depicts a scenario where the UAE Server sends a request to notify a previously subscribed service consumer on UAV dynamic information event(s) (see also clause 7.8 of 3GPP°TS°23.255°[6]).



Figure 5.6.2.3.2-1: Procedure for UAV Dynamic Information Notification

1. In order to notify a previously subscribed service consumer on UAV dynamic information event(s), the UAE Server shall send an HTTP POST request to the service consumer with the request URI set to "{notifUri}", where the "notifUri" variable is set to the value received from the service consumer during the creation/update of the corresponding UAV Dynamic Information Subscription using the procedures defined in clause 5.6.2.2, and the request body including the UAVDynInfoNotif data structure.

2a. Upon success, the service consumer shall respond to the UAE Server with an HTTP "204 No Content" status code to acknowledge the successful reception and processing 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 6.5.7.

## 5.7 UAE\_FlightPathMonitoring Service

### 5.7.1 Service Description

The UAE\_FlightPathMonitoring service exposed by the UAE Server enables a service consumer to:

- create/update/delete a Flight Path Monitoring Configuration; and

- receive notifications on flight path monitoring related event(s).

### 5.7.2 Service Operations

#### 5.7.2.1 Introduction

The service operations defined for the UAE\_FlightPathMonitoring service are shown in table 5.7.2.1-1.

Table 5.7.2.1-1: UAE\_FlightPathMonitoring Service Operations

|  |  |  |
| --- | --- | --- |
| Service Operation Name | Description | Initiated by |
| UAE\_FlightPathMonitoring\_Manage | This service operation enables a service consumer to create/update/delete a Flight Path Monitoring Configuration. | e.g., UASS |
| UAE\_FlightPathMonitoring\_Notify | This service operation enables a UAE Server to notify a previously subscribed service consumer on flight path monitoring related event(s). | UAE Server |

#### 5.7.2.2 UAE\_FlightPathMonitoring\_Manage

##### 5.7.2.2.1 General

This service operation is used by a service consumer to request the creation/update/deletion of a Flight Path Monitoring Configuration at the UAE Server.

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

- Flight Path Monitoring Configuration Creation.

- Flight Path Monitoring Configuration Update.

- Flight Path Monitoring Configuration Deletion.

##### 5.7.2.2.2 Flight Path Monitoring Configuration Creation

Figure 5.7.2.2.2-1 depicts a scenario where a service consumer sends a request to the UAE Server to create a Flight Path Monitoring Configuration (see also clause 7.9 of 3GPP°TS°23.255°[6]).



Figure 5.7.2.2.2-1: Procedure for Flight Path Monitoring Configuration Creation

1. In order to request the creation of a Flight Path Monitoring Configuration, the service consumer shall send an HTTP POST request to the UAE Server targeting the "Flight Path Monitoring Configurations" collection resource, with the request body including the FlightPathMonConfigReq 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 Flight Path Monitoring Configuration" resource and potentially additional information within the FlightPathMonConfigResp 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 6.6.7.

##### 5.7.2.2.3 Flight Path Monitoring Configuration Update

Figure 5.7.2.2.3-1 depicts a scenario where a service consumer sends a request to the UAE Server to update an existing Flight Path Monitoring Configuration (see also clause 7.9 of 3GPP°TS°23.255°[6]).



Figure 5.7.2.2.3-1: Procedure for Flight Path Monitoring Configuration Update

1. In order to request the update/modification of an existing Flight Path Monitoring Configuration, the service consumer shall send an HTTP PUT/PATCH request to the UAE Server targeting the corresponding "Individual Flight Path Monitoring Configuration" resource, with the request body including either:

- the updated representation of the resource within the FlightPathMonConfig data structure, in case the HTTP PUT method is used; or

- the requested modifications to the resource within the FlightPathMonConfigPatch data structure, in case the HTTP PATCH method is used.

NOTE: An alternative service consumer (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 Flight Path Monitoring Configuration" resource within the FlightPathMonConfig 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 6.6.7.

##### 5.7.2.2.4 Flight Path Monitoring Configuration Deletion

Figure 5.7.2.2.4-1 depicts a scenario where a service consumer sends a request to the UAE Server to delete an existing Flight Path Monitoring Configuration (see also clause 7.9 of 3GPP°TS°23.255°[6]).



Figure 5.7.2.2.4-1: Procedure for Flight Path Monitoring Configuration Deletion

1. In order to request the deletion of an existing Flight Path Monitoring Configuration, the service consumer shall send an HTTP DELETE request to the UAE Server targeting the corresponding "Individual Flight Path Monitoring Configuration" resource.

NOTE: An alternative service consumer (i.e. other than the one that requested the creation/update 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 6.6.7.

#### 5.7.2.3 UAE\_FlightPathMonitoring\_Notify

##### 5.7.2.3.1 General

This service operation is used by a UAE Server to notify a previously subscribed service consumer flight path monitoring related event(s).

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

- Flight Path Monitoring Configuration Completion Status Notification.

- Flight Path Monitoring Events Notification.

##### 5.7.2.3.2 Flight Path Monitoring Configuration Completion Status Notification

Figure 5.7.2.3.2-1 depicts a scenario where the UAE Server sends a request to notify a previously subscribed service consumer on the completion status of a Flight Path Monitoring Configuration (see also clause 7.9 of 3GPP°TS°23.255°[6]).



Figure 5.7.2.3.2-1: Flight Path Monitoring Configuration Completion Status Notification procedure

1. In order to notify a service consumer on the completion status of a Flight Path Monitoring Configuration, the UAE Server shall send an HTTP POST request to the service consumer with the request URI set to "{notifUri}/fpm-comp", where the "notifUri" variable is set to the value received from the service consumer during the corresponding Flight Path Monitoring Configuration Creation/Update procedure defined in clause 5.7.2.2, and the request body including the FlightPathMonConfigNotif data structure.

If the service consumer 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 service consumer towards which the notification should be sent, as defined in clause 5.2.10 of 3GPP TS 29.122 [2].

2a. Upon success, the service consumer shall respond to the UAE Server with an HTTP "204 No Content" status code to acknowledge the successful 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 6.6.7.

##### 5.7.2.3.3 Flight Path Monitoring Events Notification

Figure 5.7.2.3.3-1 depicts a scenario where the UAE Server sends a request to notify a previously subscribed service consumer on Flight Path Monitoring event(s) (see also clause 7.9 of 3GPP°TS°23.255°[6]).



Figure 5.7.2.3.3-1: Flight Path Monitoring Events Notification procedure

1. In order to notify a service consumer on Flight Path Monitoring event(s), the UAE Server shall send an HTTP POST request to the service consumer with the request URI set to "{notifUri}/fpm-events", where the "notifUri" variable is set to the value received from the service consumer during the corresponding Flight Path Monitoring Configuration Creation/Update procedure defined in clause 5.7.2.2, and the request body including the FlightPathMonNotif data structure.

If the service consumer 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 service consumer towards which the notification should be sent, as defined in clause 5.2.10 of 3GPP TS 29.122 [2].

2a. Upon success, the service consumer shall respond to the UAE Server with an HTTP "204 No Content" status code to acknowledge the successful 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 6.6.7.

## 5.8 UAE\_FlightRouteSupport Service

### 5.8.1 Service Description

The UAE\_FlightRouteSupport service exposed by the UAE Server enables a service consumer to:

- trigger a flight route request.

### 5.8.2 Service Operations

#### 5.8.2.1 Introduction

The service operations defined for the UAE\_FlightRouteSupport service are shown in table 5.8.2.1-1.

Table 5.8.2.1-1: UAE\_FlightRouteSupport Service Operations

|  |  |  |
| --- | --- | --- |
| Service Operation Name | Description | Initiated by |
| UAE\_FlightPathMonitoring\_Manage | This service operation enables a service consumer to request flight routes management. | e.g., UASS |

#### 5.8.2.2 UAE\_FlightRouteSupport\_Manage

##### 5.8.2.2.1 General

This service operation is used by a service consumer to request flight routes management at the UAE Server.

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

- Flight Route Request.

##### 5.8.2.2.2 Flight Route Request

Figure 5.8.2.2.2-1 depicts a scenario where a service consumer sends a request to the UAE Server to trigger a flight route request (see also clause 7.10 of 3GPP°TS°23.255°[6]).



Figure 5.8.2.2.2-1: Procedure for Flight Route Request

1. In order to trigger a flight route request, the service consumer shall send an HTTP POST request (custom operation: "FlightRouteRequest") to the UAE Server, with the request body including the FlightRouteReq 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 "200 OK" status code with the response body including the FlightRouteResp 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 6.7.7.

# 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 service consumer 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 service consumer 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 service consumer 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 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 6.1.4.2.2-3: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains 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 | Contains 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 service consumer 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 service consumer 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 service consumer 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 service consumer. |

#### 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 service consumer 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 service consumer 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 service consumer 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 6.1.5.2.3.1-3: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI representing the end point of an alternative service consumer 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 | Contains an alternative URI representing the end point of an alternative service consumer 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 service consumer 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 service consumer 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 service consumer 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 6.1.5.3.3.1-3: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI representing the end point of an alternative service consumer 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 | Contains an alternative URI representing the end point of an alternative service consumer 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 service consumer 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 service consumer 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 service consumer 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 service consumer 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 service consumer 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 6.1.5.4.3.1-3: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI representing the end point of an alternative service consumer 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 | Contains an alternative URI representing the end point of an alternative service consumer 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. |  |
| C2DirectAvailRepReqs | 6.1.6.2.12 | Represents the "Direct C2 Communication" mode availability reporting requirements. | UASApp\_2 |
| DualC2Data | 6.1.6.2.13 | Represents the Dual C2 communication mode related information. | UASApp\_3 |
| 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. |  |
| ProseApplicationCodeSuffixPool | 3GPP TS 29.555 [15] | Represents a ProSe Application Code Suffix Pool. | UASApp\_2 |
| ProseApplicationMask | 3GPP TS 29.555 [15] | Represents a Mask for a ProSe Application Code Suffix. | UASApp\_2 |
| ReportingInformation | 3GPP TS 29.523 [14] | Represents the event reporting requirements. | UASApp\_2 |
| 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. |  |
| TimeWindow | 3GPP TS 29.122 [2] | Represents a time window. | UASApp\_2 |
| 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 service consumer 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:  (NOTE 2) |  |
| notificationUri | Uri | M | 1 | Contains the notification URI via which the notifications shall be delivered. |  |
| 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.  (NOTE 3, NOTE 4) |  |
| 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.  (NOTE 3, NOTE 4) |  |
| c2SwitchPolicies | C2SwitchPolicies | M | 1 | Contains the C2 operation mode switching policies.  (NOTE 1, NOTE 2) |  |
| 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. |  |
| c2DirectAvailRepReqs | C2DirectAvailRepReqs | O | 0..1 | Contains the "Direct C2 Communication" mode availability reporting requirements. | UASApp\_2 |
| dualNetAssistC2Info | DualC2Data | C | 0..1 | Contains the information related to the Dual Network-Assisted C2 communication links.  This attribute shall be present only if the "allowedC2CommModes" attribute contains an array element set to "NETWORK\_ASSISTED\_C2\_COMMUNICATION" and the "c2CommModeSwitchTypes" attribute contains an array element set to "NETWORK\_ASSISTED\_TO\_NETWORK\_ASSISTED". | UASApp\_3 |
| dualUTMNavC2Info | DualC2Data | C | 0..1 | Contains the information related to the Dual Network-Assisted C2 communication links.  This attribute shall be present only if the "allowedC2CommModes" attribute contains an array element set to "UTM\_NAVIGATED\_C2\_COMMUNICATION" and the "c2CommModeSwitchTypes" contains an array element set to "UTM\_NAVIGATED\_C2\_TO\_UTM\_NAVIGATED\_C2". | UASApp\_3 |
| 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 service consumer. |  |
| NOTE 1: In this release of the specification, only the "directC2LinkQualityThrlds" attribute and/or the "uuC2LinkQualityThrlds" attribute within the C2SwitchPolicies data structure is/are applicable within this attribute.  NOTE 2: When the "UASApp\_3" feature is supported and the "c2CommModeSwitchTypes" attribute contains only the "NETWORK\_ASSISTED\_TO\_NETWORK\_ASSISTED" and/or "UTM\_NAVIGATED\_C2\_TO\_UTM\_NAVIGATED\_C2" value(s), then the value of the "c2SwitchPolicies" attribute shall be ignored and the "c2ServiceArea" attribute shall not be present.  NOTE 3: When the "UASApp\_3" feature is supported and the "primaryC2CommMode" attribute is set to "NETWORK\_ASSISTED\_C2\_COMMUNICATION\_DUAL", then the "secondaryC2CommMode" attribute shall not be present, i.e., the C2 communication mode for both the primary and secondary C2 communication links is "Network-Assisated C2 Communication".  NOTE 4: When the "UASApp\_3" feature is supported and the "primaryC2CommMode" attribute is set to "UTM\_NAVIGATED\_C2\_COMMUNICATION\_DUAL", then the "secondaryC2CommMode" attribute shall not be present, i.e., the C2 communication mode for both the primary and secondary C2 communication links is "UTM-Navigated C2 Communication". | | | | | |

##### 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.  (NOTE 1, NOTE 2) |  |
| 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.  (NOTE 1, NOTE 2) |  |
| NOTE 1: When the "UASApp\_3" feature is supported and the "selPrimaryC2CommMode" attribute is set to "NETWORK\_ASSISTED\_C2\_COMMUNICATION\_DUAL", then the "selSecondaryC2CommMode" attribute shall not be present, i.e., the selected C2 communication mode for both the primary and secondary C2 communication links is "Network-Assisated C2 Communication".  NOTE 2: When the "UASApp\_3" feature is supported and the "selPrimaryC2CommMode" attribute is set to "UTM\_NAVIGATED\_C2\_COMMUNICATION\_DUAL", then the "selSecondaryC2CommMode" attribute shall not be present, i.e., the selected C2 communication mode for both the primary and secondary C2 communication links is "UTM-Navigated 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 service consumer. |  |
| 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 service consumer 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.  (NOTE) |  |
| 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) |  |
| c2DirectAvailRepReqs | C2DirectAvailRepReqs | O | 0..1 | Contains the "Direct C2 Communication" mode availability reporting requirements. | UASApp\_2 |
| dualC2Link1QualityThrlds | C2LinkQualityThrlds | O | 0..1 | Contains the threshold(s) used to evaluate the quality of the first C2 communication link in the case of Dual C2 communications.  (NOTE) | UASApp\_3 |
| dualC2SimuLinksQualityThrlds | C2LinkQualityThrlds | O | 0..1 | Contains the threshold(s) used to evaluate the quality of the simultaneous operation of both C2 communication links in the case of Dual C2 communications.  (NOTE) | UASApp\_3 |
| NOTE: At least one of these attributes shall be present. | | | | | |

##### 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 C2 link.  Value range: 0-127.  (NOTE 1) |  |
| nrRsrpThrldHigh | integer | O | 0..1 | Represents the upper RSRP value threshold for the C2 link.  Value range: 0-127.  (NOTE 2) |  |
| nrRsrqThrldLow | integer | O | 0..1 | Represents the lower RSRQ value threshold for the C2 link.  Value range: 0-127.  (NOTE 1) |  |
| nrRsrqThrldHigh | integer | O | 0..1 | Represents the upper RSRQ value threshold for the C2 link.  Value range: 0-127.  (NOTE 2) |  |
| packetLossThrldLow | PacketLossRate | O | 0..1 | Represents the lower packet loss rate value threshold for the C2 link.  (NOTE 1) |  |
| packetLossThrldHigh | PacketLossRate | O | 0..1 | Represents the upper packet loss rate value threshold for the 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. | | | | | |

##### 6.1.6.2.12 Type: C2DirectAvailRepReqs

Table 6.1.6.2.12-1: Definition of type C2DirectAvailRepReqs

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| proseAppCodeSuffixPool | ProseApplicationCodeSuffixPool | O | 0..1 | Represents the ProSe Application Code Suffix Pool.  (NOTE) |  |
| proseAppMasks | array(ProseApplicationMask) | O | 1..N | Represents the mask(s) for the ProSe Application Code Suffix(es). |  |
| validity | TimeWindow | O | 0..1 | Contains the time window within which the "Direct C2 Communication" mode availability reporting applies.  (NOTE) |  |
| repReqs | ReportingInformation | O | 0..1 | Contains the reporting requirements of the "Direct C2 Communication" mode availability reporting.  (NOTE) |  |
| NOTE: At least one of these attributes shall be present. | | | | | |

##### 6.1.6.2.13 Type: DualC2Data

Table 6.1.6.2.13-1: Definition of type DualC2Data

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| link1C2SwitchPolicies | C2SwitchPolicies | O | 0..1 | Contains the C2 operation mode switching policies for the first C2 communication link.  (NOTE 1, NOTE 2) |  |
| link1C2ServiceArea | C2ServiceArea | O | 0..1 | Contains the service area within which the first C2 communication link applies.  (NOTE 1) |  |
| link2C2SwitchPolicies | C2SwitchPolicies | O | 0..1 | Contains the C2 operation mode switching policies for the second C2 communication link.  (NOTE 1, NOTE 3) |  |
| link2C2ServiceArea | C2ServiceArea | O | 0..1 | Contains the service area within which the first C2 communication link applies.  (NOTE 1) |  |
| NOTE 1: At least one of these attributes shall be present.  NOTE 2: In this release of the specification, only the "dualC2Link1QualityThrlds" attribute within the C2SwitchPolicies data structure is applicable within this attribute.  NOTE 3: In this release of the specification, only the "dualC2SimuLinksQualityThrlds" attribute within the C2SwitchPolicies data structure is applicable within this attribute. | | | | | |

#### 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. |  |
| NETWORK\_ASSISTED\_C2\_COMMUNICATION\_DUAL | Represents Network-Assisted C2 Communication mode via a specific subscription/network (i.e., in case of Dual Network-Assisted C2 communications). | UASApp\_3 |
| UTM\_NAVIGATED\_C2\_COMMUNICATION | Represents UTM-Navigated C2 communication mode. |  |
| UTM\_NAVIGATED\_C2\_COMMUNICATION\_DUAL | Represents UTM-Navigated C2 communication mode via a specific subscription/network (i.e., in case of Dual UTM-Navigated C2 communications). | UASApp\_3 |

##### 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. |  |
| NETWORK\_ASSISTED\_TO\_NETWORK\_ASSISTED | Represents the C2 Communication Mode switching between two Network-Assisted C2 Communication modes (e.g., via different subscriptions/networks). | UASApp\_3 |
| UTM\_NAVIGATED\_C2\_TO\_UTM\_NAVIGATED\_C2 | Represents the C2 Communication Mode switching between two UTM-Navigated C2 Communication modes (e.g., via different subscriptions/networks). | UASApp\_3 |

##### 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. |  |
| ACTIVE\_LINK\_DEGRADATION | Indicates that the C2 Communication Mode switching was triggered due to a degradation of the active link in case of Dual C2 communications (e.g., Dual Network-Assisted C2 communications, Dual UTM-Navigated C2 communications). | UASApp\_3 |
| 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 |
| 1 | UASApp\_2 | This feature indicates the support of the first set of enhancements to the UAS Applications Enabler Layer.  Within this feature, the following enhancements are covered:  - Support the provisioning of the "Direct C2 Communication" mode availability reporting requirements.  - Support the provisioning of the threshold(s) used to evaluate the quality of the UTM-Navigated C2 link within C2 switwhing policies. |
| 2 | UASApp\_3 | This feature indicates the support of the second set of enhancements to the UAS Applications Enabler Layer.  Within this feature, the following enhancements are covered:  - Support Dual C2 communications (e.g., Dual Network-Assisted C2 communications, Dual UTM-Navigated C2 communications). |

Editor's note: Whether the functionalities defined under this feature are needed or not is FFS.

### 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 service consumer 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 service consumer 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 mandatory HTTP error status codes for the HTTP GET method listed in table 5.2.6-1 of 3GPP TS 29.122 [2] shall 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 | Contains 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 | Contains an alternative URI of the resource located in an alternative UAE Server. |

###### 6.2.3.2.3.2 POST

The POST method allows a service consumer 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 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 6.2.3.2.3.2-4: 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 service consumer 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 mandatory HTTP error status codes for the HTTP GET method listed in table 5.2.6-1 of 3GPP TS 29.122 [2] shall 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 | Contains 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 | Contains an alternative URI of the resource located in an alternative UAE Server. |

###### 6.2.3.3.3.2 PUT

The PUT method allows a service consumer 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 mandatory HTTP error status codes for the HTTP PUT method listed in table 5.2.6-1 of 3GPP TS 29.122 [2] shall 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 | Contains 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 | Contains an alternative URI of the resource located in an alternative UAE Server. |

###### 6.2.3.3.3.3 DELETE

The DELETE method allows a service consumer 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 mandatory HTTP error status codes for the HTTP DELETE method listed in table 5.2.6-1 of 3GPP TS 29.122 [2] shall 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 | Contains 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 | Contains 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 service consumer 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 service consumer 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 service consumer 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 service consumer 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 6.2.5.2.3.1-3: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI representing the end point of an alternative service consumer 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 | Contains an alternative URI representing the end point of an alternative service consumer 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 service consumer 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 real-time UAV status notifications shall be delivered. |  |
| 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 | 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-ucm".

- 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 service consumer 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" resource. |
| PUT | Request the update of an existing "Individual USS Change Policy" resource. |
| PATCH | Request the modification of an existing "Individual USS Change Policy" resource. |
| DELETE | Request the deletion of an existing "Individual USS Change Policy" resource. |

#### 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-ucm/****<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 6.3.1. |

##### 6.3.3.2.3 Resource Standard Methods

###### 6.3.3.2.3.1 GET

The HTTP GET method allows a service consumer 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 | 0..N | 200 OK | Successful case. All the active USS Change Policies managed by the UAE Server shall be returned.  When there are no active USS Change Policies at the UAE Server, an empty array 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 codes 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 | Contains 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 | Contains 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 service consumer 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 URI of the created resource shall also be included. |
| 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 6.3.3.2.3.2-4: 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-ucm/<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-ucm/<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 6.3.1. |
| 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 service consumer 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 codes 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 | Contains 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 | Contains 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 service consumer 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 codes 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 | Contains 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 | Contains an alternative URI of the resource located in an alternative UAE Server. |

###### 6.3.3.3.3.3 PATCH

The HTTP PATCH method allows a service consumer 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 6.3.3.3.3.3-1.

Table 6.3.3.3.3.3-1: 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 6.3.3.3.3.3-2 and the response data structures and response codes specified in table 6.3.3.3.3.3-3.

Table 6.3.3.3.3.3-2: 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 6.3.3.3.3.3-3: 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 codes for the HTTP PATCH method listed in table 5.2.6-1 of 3GPP TS 29.122 [2] shall also apply. | | | | |

Table 6.3.3.3.3.3-4: Headers supported by the 307 Response Code on this resource

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

Table 6.3.3.3.3.3-5: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains 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 service consumer 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 codes 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 | Contains 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 | Contains 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 service consumer 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 service consumer 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 custom operation

|  |  |  |  |
| --- | --- | --- | --- |
| 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 custom operation

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response  codes | Description |
| n/a |  |  | 204 No Content | Successful case. The USS change request is successfully received and processed. |
| 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 codes for the HTTP POST method listed in table 5.2.6-1 of 3GPP TS 29.122 [2] shall also apply. | | | | |

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

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains 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 custom operation

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains 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 Notification | {notifUri} | POST | This service operation enables a UAE Server to notify a previously subscribed service consumer on USS change related event(s). |

#### 6.3.5.2 USS Change Notification

##### 6.3.5.2.1 Description

The USS Change Notification is used by a UAE Server to notify a previously subscribed service consumer on USS Change related event(s).

##### 6.3.5.2.2 Target URI

The Callback URI **"{notifUri}"** 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 | Represents the callback URI encoded as a string formatted as a URI. |

##### 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 |
| USSChangeNotif | M | 1 | Represents the USS Change 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 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 service consumer towards which 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 service consumer towards which 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 | Contains an alternative URI representing the end point of an alternative service consumer 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 | Contains an alternative URI representing the end point of an alternative service consumer 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 |
| MobilityEvent | 6.3.6.3.4 | Represents a mobility event. |  |
| MultiUssPol | 6.3.6.2.6 | Represents a Multi-USS policy. |  |
| ServArea | 6.3.6.2.7 | Represents a service area. |  |
| ServReq | 6.3.6.2.10 | Represents a service requirement. |  |
| UasRoute | 6.3.6.2.8 | Represents the UAS route. |  |
| UssChangeEvent | 6.3.6.3.3 | Represents a USS Change Event. |  |
| USSChangeNotif | 6.3.6.2.13 | Represents a USS Change 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 | 6.3.6.2.11 | Represents the parameters to request for USS change. |  |
| UssChgInfo | 6.3.6.2.14 | Represents the USS change trigger information. |  |
| UssId | 6.3.6.3.2 | Represents the identifier of a USS. |  |
| UssInfo | 6.3.6.2.9 | Represents USS information. |  |
| TgtUssInfo | 6.3.6.2.12 | Represents the target USS related information. |  |

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 |
| Bytes | 3GPP TS 29.122 [2] | Represents a sequence of bytes. |  |
| Dnai | 3GPP TS 29.571 [7] | Represents a DNAI. |  |
| EndPoint | 3GPP TS 29.558 [13] | Represents endpoint information. |  |
| 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] | Represents the list of supported feature(s) and 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 |
| requestorId | Uri | M | 1 | Contains the identity of the service consumer 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 present only when feature negotiation needs to 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 present only when feature negotiation needs to 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 USS Change management related notifications shall be delivered. |  |
| uasRegArea | ServArea | O | 0..1 | Contains the registration area within which the UAS is allowed to fly. |  |
| uasAllowedRoute | array(UasRoute) | O | 1..N | Contains the allowed route(s) 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. |  |

##### 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 USS Change management related notifications shall be delivered. |  |
| uasRegArea | ServArea | O | 0..1 | Contains the updated registration area within which the UAS is allowed to fly. |  |
| uasAllowedRoute | array(UasRoute) | O | 1..N | Contains the updated allowed route for the UAS within the UAS registration area provided by the "uasRegArea" attribute.  This attribute may be present only if the "uasRegArea" attribute is present. |  |
| multiUssPol | MultiUssPol | O | 0..1 | Contains the updated multi-USS policy management container. |  |

##### 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 |
| servingUssId | UssId | M | 1 | Contains the identifier of the serving USS. |  |
| servingUssInfo | string | M | 1 | Contains additional serving USS related information (e.g., related to switching to target USSs). |  |
| ussChangeArea | ServArea | M | 1 | Contains the area within which the where the Multi-USS management policy applies |  |
| allowedTgtUsss | array(UssInfo) | O | 1..N | Contains the allowed target USS(s) related information. |  |

##### 6.3.6.2.7 Type: ServArea

Table 6.3.6.2.7-1: Definition of type ServArea

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 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 constitute the service area. |  |
| NOTE: Either the "geographicAreaList" attribute, or the "ncgiList" attribute and/or the "taiList" attribute shall be provided. | | | | | |

##### 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 |
| routeInfo | map(GeographicArea) | M | 2..N | Contains a list of two or more ordered geographic area(s) that constitute the UAS route.  The key of the map shall be an unsigned integer (with the minimum value being 1) indicating the order of the geographic area, provided within the corresponding map entry, in the derivation of the route, with the first map entry being the start of the route and the last entry of the map being the end of the route. |  |

##### 6.3.6.2.9 Type: UssInfo

Table 6.3.6.2.9-1: Definition of type UssInfo

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| ussId | UssId | M | 1 | Contains the identifier of the USS. |  |
| ussServArea | ServArea | M | 1 | Contains service area of the USS. |  |
| ussServReqs | array(ServReq) | M | 1..N | Contains the USS related service requirements. |  |
| dnais | array(Dnai) | M | 1..N | Contains the list of DNAI(s) associated with the USS. |  |
| lunId | string | M | 1 | Contains the identifier of the LUN to which the USS belongs. |  |

##### 6.3.6.2.10 Type: ServReq

Table 6.3.6.2.10-1: Definition of type ServReq

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| reqName | string | M | 1 | Contains the USS service requirement name. |  |
| reqValue | Bytes | M | 1 | Contains the USS service requirement value. |  |

##### 6.3.6.2.11 Type: USSChangeReq

Table 6.3.6.2.11-1: Definition of type USSChangeReq

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| requestorId | Uri | M | 1 | Contains the identity of the service consumer 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. |  |
| targetUssId | UssId | M | 1 | Contains the identifier of the target USS. |  |
| targetUssInfo | TgtUssInfo | O | 0..1 | Contains the the target USS related information. |  |
| suppFeat | SupportedFeatures | C | 0..1 | Contains the list of supported features among the ones defined in clause 6.3.8.  This attribute shall be present only when feature negotiation needs to take place. |  |

##### 6.3.6.2.12 Type: TgtUssInfo

Table 6.3.6.2.12-1: Definition of type TgtUssInfo

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| ussEdpt | EndPoint | M | 1 | Contains the target USS endpoint information. |  |
| ussServReqs | array(ServReq) | O | 1..N | Contains the target USS related service requirements. |  |
| lunId | string | O | 0..1 | Contains the identifier of the LUN. |  |
| dnais | array(Dnai) | O | 1..N | Contains the allowed target USS(s) related information. |  |

##### 6.3.6.2.13 Type: USSChangeNotif

Table 6.3.6.2.13-1: Definition of type USSChangeNotif

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| event | UssChangeEvent | M | 1 | Contains the reported USS change event. |  |
| polConfigStatus | boolean | C | 0..1 | Indicates the status of the USS change policy configuration.  - "true" indicates that the USS change policy configuration was successful.  - "false" indicates that the USS change policy configuration failed.  This attribute shall be present only when the reported event within the "event" attribute is "USS\_CHG\_POL\_CONFIG\_STATUS". |  |
| tgtUssId | UssId | C | 0..1 | Contains the identifier of the target USS towards which the UAE Client assisted USS change was performed.  This attribute shall be present only when the reported event within the "event" attribute is "UAE\_CLIENT\_ASSIST\_USS\_CHG". |  |
| ussChgInfo | UssChgInfo | C | 0..1 | Contains the identifier target USS towards which the UAE Client assisted USS change was performed.  This attribute shall be present only when the reported event within the "event" attribute is "UAE\_SERVER\_TRIGG\_USS\_CHG". |  |

##### 6.3.6.2.14 Type: UssChgInfo

Table 6.3.6.2.14-1: Definition of type UssChgInfo

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| servingUssId | UssId | M | 1 | Contains the identifier of the serving USS. |  |
| targetUssId | UssId | O | 0..1 | Contains the identifier of the target USS. |  |
| lunId | string | O | 0..1 | Contains the identifier of the LUN. |  |
| mobilityEvent | MobilityEvent | O | 0..1 | Contains the reported mobility event. |  |

#### 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 |
| UssId | string | Represents the identifier of a USS, encoded in the form of e.g., an FQDN, a URI, etc. |  |

##### 6.3.6.3.3 Enumeration: UssChangeEvent

The enumeration UssChangeEvent represents a USS Change Event. It shall comply with the provisions defined in table 6.3.6.3.3-1.

Table 6.3.6.3.3-1: Enumeration UssChangeEvent

|  |  |  |
| --- | --- | --- |
| Enumeration value | Description | Applicability |
| USS\_CHG\_POL\_CONFIG\_STATUS | Indicates that the USS Change Event is USS Change Policy Configuration Status.  This event is implicitly subscribed by the service consumer. |  |
| UAE\_CLIENT\_ASSIST\_USS\_CHG | Indicates that the USS Change Event is UAE Client Assisted USS Change.  This event is implicitly subscribed by the service consumer. |  |
| UAE\_SERVER\_TRIGG\_USS\_CHG | Indicates that the USS Change Event is UAE Server initiated USS Change Trigger.  This event is implicitly subscribed by the service consumer. |  |

##### 6.3.6.3.4 Enumeration: MobilityEvent

The enumeration MobilityEvent represents a mobility event. It shall comply with the provisions defined in table 6.3.6.3.4-1.

Table 6.3.6.3.4-1: Enumeration MobilityEvent

|  |  |  |
| --- | --- | --- |
| Enumeration value | Description | Applicability |
| OUT\_OF\_USS\_SERV\_AREA | Indicates that the mobility event is the expected UAV mobility to a service area that is outside the current serving USS's service area. |  |

#### 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 | Applicability |
|  |  |  |  |

### 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 service consumer 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" resource. |
| PUT | Request the update of an existing "Individual DAA Policy" resource. |
| PATCH | Request the modification of an existing "Individual DAA Policy" resource. |
| 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 6.4.1. |

##### 6.4.3.2.3 Resource Standard Methods

###### 6.4.3.2.3.1 GET

The HTTP GET method allows a service consumer 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 | 0..N | 200 OK | Successful case. All the active DAA Policies managed by the UAE Server shall be returned.  When there are no active DAA Policies at the UAE Server, an empty array 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 codes 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 | Contains 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 | Contains 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 service consumer 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 URI of the created resource shall also be included. |
| 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 6.4.3.2.3.2-4: 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 6.4.1. |
| 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 service consumer 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 codes 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 | Contains 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 | Contains 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 service consumer 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 codes 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 | Contains 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 | Contains an alternative URI of the resource located in an alternative UAE Server. |

###### 6.4.3.3.3.3 PATCH

The HTTP PATCH method allows a service consumer 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 6.4.3.3.3.3-1.

Table 6.4.3.3.3.3-1: 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 6.4.3.3.3.3-2 and the response data structures and response codes specified in table 6.4.3.3.3.3-3.

Table 6.4.3.3.3.3-2: 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 6.4.3.3.3.3-3: 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 codes for the HTTP PATCH method listed in table 5.2.6-1 of 3GPP TS 29.122 [2] shall also apply. | | | | |

Table 6.4.3.3.3.3-4: Headers supported by the 307 Response Code on this resource

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

Table 6.4.3.3.3.3-5: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains 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 service consumer 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 codes 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 | Contains 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 | Contains 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 service consumer to inform about and request the management of possible DAA related event(s). |

#### 6.4.4.2 Operation: InformDAAEvents

##### 6.4.4.2.1 Description

The custom operation enables a service consumer to inform about and request the management of possible DAA related event(s) 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 custom operation

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

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

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response  codes | Description |
| n/a |  |  | 204 No Content | Successful case. The Inform DAA Events request is successfully received and processed. |
| 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 codes for the HTTP POST method listed in table 5.2.6-1 of 3GPP TS 29.122 [2] shall also apply. | | | | |

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

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains 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 custom operation

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains 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 service consumer on the status of DAA Policy configuration. |
| DAA Events Notification | {notifUri}/daa-events | daa-events (POST) | This service operation enables a UAE Server to notify a previously subscribed service consumer 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 service consumer 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 | Represents the callback URI encoded as a string formatted as a URI. |

##### 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 the 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 service consumer towards which 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 service consumer towards which 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 | Contains an alternative URI representing the end point of an alternative service consumer 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 | Contains an alternative URI representing the end point of an alternative service consumer towards which the notification should be redirected. |

#### 6.4.5.3 DAA Events Notification

##### 6.4.5.3.1 Description

The DAA Events Notification is used by a UAE Server to notify a previously subscribed service consumer 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 | Represents the callback URI encoded as a string formatted as a URI. |

##### 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 the DAA Events 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 Events Notification is successfully received and acknowledged, and updated/additional DAA related event information is returned in the response body. |
| n/a |  |  | 204 No Content | Successful case. The DAA Events 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 service consumer towards which 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 service consumer towards which 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 | Contains an alternative URI representing the end point of an alternative service consumer 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 | Contains an alternative URI representing the end point of an alternative service consumer 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 |
| Alert | 6.4.6.3.4 | Represents the LDGS-based DAA related alert. | UASApp\_3 |
| DAAAppPolicy | 6.4.6.2.6 | Represents a DAA Application policy. |  |
| DAAEvent | 6.4.6.2.10 | Represents a DAA event related information. |  |
| DAAEventsInfo | 6.4.6.2.9 | Represents a DAA Events Notification. |  |
| DAAPolConfigNotif | 6.4.6.2.8 | Represents a DAA Policy Configuration Status Notification. |  |
| DAAPolConfigStatus | 6.4.6.3.3 | Represents the DAA Policy configuration completion status. |  |
| 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 creation 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 |
| Bytes | 3GPP TS 29.122 [2] | Represents a sequence of bytes. |  |
| DateTime | 3GPP TS 29.122 [2] | Represents a date and a time. | UASApp\_3 |
| LocationInfo | 3GPP TS 29.122 [2] | Represents user location information. |  |
| ReportingInformation | 3GPP TS 29.523 [14] | Represents the event reporting requirements. | UASApp\_3 |
| ServArea | Clause 6.3.6.2.7 | Represents a service area. | UASApp\_3 |
| SupportedFeatures | 3GPP TS 29.571 [7] | Represents the list of supported feature(s) and used to negotiate the applicability of the optional features. |  |
| TimeWindow | 3GPP TS 29.122 [2] | Represents a time window. | UASApp\_3 |
| 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 |
| requestorId | Uri | M | 1 | Contains the identity of the service consumer that is sending the request. |  |
| daaPol | DAAPolicy | M | 1 | Contains the DAA Policy that is to 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 present only when feature negotiation needs to 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 present only when feature negotiation needs to 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. |  |
| targetUasIds | array(UasId) | C | 1..N | Contains the identifier(s) of the target UAS(s) for which LDGS-based assistance applies.  This attribute shall be present only if the UAS identified by the "uasId" attribute is a UAS with LDGS capability. | UASApp\_3 |
| ldgsArea | ServArea | O | 0..1 | Contains the area within which LDGS-based assistance applies.  This attribute may be present only if the UAS identified by the "uasId" attribute is a UAS with LDGS capability. | UASApp\_3 |
| notifUri | Uri | M | 1 | Contains the notification URI via which DAA related notifications shall be delivered. |  |
| daaAppPol | DAAAppPolicy | M | 1 | Contains the DAA Application policy consisting of the requirements and policies for DAA management. |  |

##### 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 |
| targetUasIds | array(UasId) | O | 1..N | Contains the identifier(s) of the target UAS(s) for which LDGS-based assistance applies.  This attribute may be present only if the UAS identified by the "uasId" attribute of the targeted resource representation is a UAS with LDGS capability. | UASApp\_3 |
| ldgsArea | ServArea | O | 0..1 | Contains the area within which LDGS-based assistance applies.  This attribute may be present only if the UAS identified by the "uasId" attribute of the targeted resource representation is a UAS with LDGS capability. | UASApp\_3 |
| notifUri | Uri | O | 0..1 | Contains the updated notification URI via which DAA related notifications shall be delivered. |  |
| 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 |
| polContainer | Bytes | C | 0..1 | Represents the content of the DAA Application Policy.  (NOTE) |  |
| daaTriggThresholds | string | C | 0..1 | Contains the threshold(s) to be used to trigger LDGS-based DAA.  (NOTE) | UASApp\_3 |
| validity | TimeWindow | C | 0..1 | Contains the time window within which the DAA Application Policy applies for LDGS-based DAA.  (NOTE) | UASApp\_3 |
| repReqs | ReportingInformation | C | 0..1 | Contains the reporting requirements to be used for LDGS-based DAA related event(s) reporting.  (NOTE) | UASApp\_3 |
| NOTE: At least one of these attributes shall be present. | | | | | |

Editor’s Note: The encoding and content of the "daaTriggThresholds" attribute 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 |
| requestorId | Uri | M | 1 | Contains the identity of the service consumer 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 present only when feature negotiation needs to 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 to which the DAA event information management request is related. |  |
| daaEventsInfo | array(DAAEvent) | M | 1..N | Contains the detected DAA event(s) 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 present only when feature negotiation needs to 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 for which a DAA event is detected. |  |
| uasLocInfo | LocationInfo | M | 1 | Contains the location information of the UAS with which a potential flight path conflict is detected. |  |
| alert | Alert | C | 0..1 | Contains the detected LDGS-based DAA alert. | UASApp\_3 |
| entryTime | DateTime | O | 0..1 | Contains the time at which the UAS enters the monitoring range of the LDGS. | UASApp\_3 |
| exitTime | DateTime | O | 0..1 | Contains the time at which the UAS leaves the monitoring range of the LDGS. | UASApp\_3 |

#### 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 the 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. |  |

##### 6.4.6.3.4 Enumeration: Alert

The enumeration Alert represents the LDGS-based DAA related alert. It shall comply with the provisions of table 6.4.6.3.4-1.

Table 6.4.6.3.4-1: Enumeration DAAPolConfigStatus

|  |  |  |
| --- | --- | --- |
| Enumeration value | Description | Applicability |
| RISK\_OF\_COLLISION | Indicates that the LDGS-based DAA related alert is risk of collision. |  |
| COLLISION\_DETECTED | Indicates that the LDGS-based DAA related alert is collision detected. |  |
| COLLISION\_RESOLVED | Indicates that the LDGS-based DAA related alert is collision (or risk of collision) resolved. |  |

#### 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 | Applicability |
|  |  |  |  |

### 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 |
| 1 | UASApp\_3 | This feature indicates the support of the second set of enhancements to the UAS Applications Enabler Layer.  Within this feature, the following enhancements are covered:  - Support LDGS-based DAA. |

### 6.4.9 Security

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

## 6.5 UAE\_UAVDynamicInfo API

### 6.5.1 Introduction

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

The API URI of the UAE\_UAVDynamicInfo 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-udi".

- 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 6.5, the UAE Server takes the role of the SCEF and the service consumer takes the role of the SCS/AS.

### 6.5.2 Usage of HTTP

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

### 6.5.3 Resources

#### 6.5.3.1 Overview

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

Figure 6.5.3.1-1 depicts the resource URIs structure for the UAE\_UAVDynamicInfo API.



Figure 6.5.3.1-1: Resource URIs structure of the UAE\_UAVDynamicInfo API

Table 6.5.3.1-1 provides an overview of the resources and applicable HTTP methods for the UAE\_UAVDynamicInfo API.

Table 6.5.3.1-1: Resources and methods overview

|  |  |  |  |
| --- | --- | --- | --- |
| Resource name | Resource URI | HTTP method or custom operation | Description |
| UAV Dynamic Information Subscriptions | /subscriptions | GET | Retrieve all the active UAV Dynamic Information Subscriptions managed by the UAE Server. |
| POST | Request the creation of a UAV Dynamic Information Subscription. |
| Individual UAV Dynamic Information Subscription | /sbscriptions/{subscId} | GET | Retrieve an existing "Individual UAV Dynamic Information Subscription" resource. |
| PUT | Request the update of an existing "Individual UAV Dynamic Information Subscription" resource. |
| PATCH | Request the modification of an existing "Individual UAV Dynamic Information Subscription" resource. |
| DELETE | Request the deletion of an existing "Individual UAV Dynamic Information Subscription" resource. |

#### 6.5.3.2 Resource: UAV Dynamic Information Subscriptions

##### 6.5.3.2.1 Description

This resource represents the collection of UAV Dynamic Information Subscriptions managed by the UAE Server.

##### 6.5.3.2.2 Resource Definition

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

This resource shall support the resource URI variables defined in table 6.5.3.2.2-1.

Table 6.5.3.2.2-1: Resource URI variables for this resource

|  |  |  |
| --- | --- | --- |
| Name | Data type | Definition |
| apiRoot | string | See clause 6.5.1. |

##### 6.5.3.2.3 Resource Standard Methods

###### 6.5.3.2.3.1 GET

The HTTP GET method allows a service consumer to retrieve all the active UAV Dynamic Information Subscriptions managed by the UAE Server.

This method shall support the URI query parameters specified in table 6.5.3.2.3.1-1.

Table 6.5.3.2.3.1-1: 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 6.5.3.2.3.1-2 and the response data structures and response codes specified in table 6.5.3.2.3.1-3.

Table 6.5.3.2.3.1-2: Data structures supported by the GET Request Body on this resource

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

Table 6.5.3.2.3.1-3: Data structures supported by the GET Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response  codes | Description |
| array(UAVDynInfoSubsc) | M | 0..N | 200 OK | Successful case. All the active UAV Dynamic Information Subscriptions managed by the UAE Server shall be returned.  When there are no active UAV Dynamic Information Subscriptions at the UAE Server, an empty array 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 codes for the HTTP GET method listed in table 5.2.6-1 of 3GPP TS 29.122 [2] shall also apply. | | | | |

Table 6.5.3.2.3.1-4: Headers supported by the 307 Response Code on this resource

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

Table 6.5.3.2.3.1-5: Headers supported by the 308 Response Code on this resource

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

###### 6.5.3.2.3.2 POST

The HTTP POST method allows a service consumer to request the creation of a UAV Dynamic Information Subscription at the UAE Server.

This method shall support the URI query parameters specified in table 6.5.3.2.3.2-1.

Table 6.5.3.2.3.2-1: 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 6.5.3.2.3.2-2 and the response data structures and response codes specified in table 6.5.3.2.3.2-3.

Table 6.5.3.2.3.2-2: Data structures supported by the POST Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| UAVDynInfoSubsc | M | 1 | Represents the parameters to request the creation of a UAV Dynamic Information Subscription. |

Table 6.5.3.2.3.2-3: Data structures supported by the POST Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response  codes | Description |
| UAVDynInfoSubsc | M | 1 | 201 Created | Successful case. The UAV Dynamic Information Subscription is successfully created and a representation of the created "Individual UAV Dynamic Information Subscription" 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 codes for the HTTP POST method listed in table 5.2.6-1 of 3GPP TS 29.122 [2] shall also apply. | | | | |

Table 6.5.3.2.3.2-4: 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-udi/<apiVersion>/subscriptions/{subscId} |

##### 6.5.3.2.4 Resource Custom Operations

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

#### 6.5.3.3 Resource: Individual UAV Dynamic Information Subscription

##### 6.5.3.3.1 Description

This resource represents a UAV Dynamic Information Subscription managed by the UAE Server.

##### 6.5.3.3.2 Resource Definition

Resource URI: **{apiRoot}/uae-udi/<apiVersion>/subscriptions/{subscId}**

This resource shall support the resource URI variables defined in table 6.5.3.3.2-1.

Table 6.5.3.3.2-1: Resource URI variables for this resource

|  |  |  |
| --- | --- | --- |
| Name | Data type | Definition |
| apiRoot | string | See clause 6.5.1. |
| subscId | string | Represents the identifier of the "Individual UAV Dynamic Information Subscription" resource. |

##### 6.5.3.3.3 Resource Standard Methods

###### 6.5.3.3.3.1 GET

The HTTP GET method allows a service consumer to retrieve an existing "Individual UAV Dynamic Information Subscription" resource at the UAE Server.

This method shall support the URI query parameters specified in table 6.5.3.3.3.1-1.

Table 6.5.3.3.3.1-1: 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 6.5.3.3.3.1-2 and the response data structures and response codes specified in table 6.5.3.3.3.1-3.

Table 6.5.3.3.3.1-2: Data structures supported by the GET Request Body on this resource

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

Table 6.5.3.3.3.1-3: Data structures supported by the GET Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response  codes | Description |
| UAVDynInfoSubsc | M | 1 | 200 OK | Successful case. The requested "Individual UAV Dynamic Information 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 mandatory HTTP error status codes for the HTTP GET method listed in table 5.2.6-1 of 3GPP TS 29.122 [2] shall also apply. | | | | |

Table 6.5.3.3.3.1-4: Headers supported by the 307 Response Code on this resource

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

Table 6.5.3.3.3.1-5: Headers supported by the 308 Response Code on this resource

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

###### 6.5.3.3.3.2 PUT

The HTTP PUT method allows a service consumer to request the update of an existing "Individual UAV Dynamic Information Subscription" resource at the UAE Server.

This method shall support the URI query parameters specified in table 6.5.3.3.3.2-1.

Table 6.5.3.3.3.2-1: 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 6.5.3.3.3.2-2 and the response data structures and response codes specified in table 6.5.3.3.3.2-3.

Table 6.5.3.3.3.2-2: Data structures supported by the PUT Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| UAVDynInfoSubsc | M | 1 | Represents the updated representation of the "Individual UAV Dynamic Information Subscription" resource. |

Table 6.5.3.3.3.2-3: Data structures supported by the PUT Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response  codes | Description |
| UAVDynInfoSubsc | M | 1 | 200 OK | Successful case. The "Individual UAV Dynamic Information Subscription" 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 UAV Dynamic Information Subscription" 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 codes for the HTTP PUT method listed in table 5.2.6-1 of 3GPP TS 29.122 [2] shall also apply. | | | | |

Table 6.5.3.3.3.2-4: Headers supported by the 307 Response Code on this resource

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

Table 6.5.3.3.3.2-5: Headers supported by the 308 Response Code on this resource

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

###### 6.5.3.3.3.3 PATCH

The HTTP PATCH method allows a service consumer to request the modification of an existing "Individual UAV Dynamic Information Subscription" resource at the UAE Server.

This method shall support the URI query parameters specified in table 6.5.3.3.3.3-1.

Table 6.5.3.3.3.3-1: 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 6.5.3.3.3.3-2 and the response data structures and response codes specified in table 6.5.3.3.3.3-3.

Table 6.5.3.3.3.3-2: Data structures supported by the PATCH Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| UAVDynInfoSubscPatch | M | 1 | Represents the parameters to request the modification of the "Individual UAV Dynamic Information Subscription" resource. |

Table 6.5.3.3.3.3-3: Data structures supported by the PATCH Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response  codes | Description |
| UAVDynInfoSubsc | M | 1 | 200 OK | Successful case. The "Individual UAV Dynamic Information Subscription" 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 UAV Dynamic Information Subscription" 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 codes for the HTTP PATCH method listed in table 5.2.6-1 of 3GPP TS 29.122 [2] shall also apply. | | | | |

Table 6.5.3.3.3.3-4: Headers supported by the 307 Response Code on this resource

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

Table 6.5.3.3.3.3-5: Headers supported by the 308 Response Code on this resource

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

###### 6.5.3.3.3.4 DELETE

The HTTP DELETE method allows a service consumer to request the deletion of an existing "Individual UAV Dynamic Information Subscription" resource at the UAE Server.

This method shall support the URI query parameters specified in table 6.5.3.3.3.4-1.

Table 6.5.3.3.3.4-1: 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 6.5.3.3.3.4-2 and the response data structures and response codes specified in table 6.5.3.3.3.4-3.

Table 6.5.3.3.3.4-2: Data structures supported by the DELETE Request Body on this resource

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

Table 6.5.3.3.3.4-3: 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 UAV Dynamic Information Subscription" 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 codes for the HTTP DELETE method listed in table 5.2.6-1 of 3GPP TS 29.122 [2] shall also apply. | | | | |

Table 6.5.3.3.3.4-4: Headers supported by the 307 Response Code on this resource

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

Table 6.5.3.3.3.4-5: Headers supported by the 308 Response Code on this resource

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

##### 6.5.3.3.4 Resource Custom Operations

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

### 6.5.4 Custom Operations without associated resources

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

### 6.5.5 Notifications

#### 6.5.5.1 General

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

Table 6.5.5.1-1: Notifications overview

|  |  |  |  |
| --- | --- | --- | --- |
| Notification | Callback URI | HTTP method or custom operation | Description  (service operation) |
| UAV Dynamic Information Notification | {notifUri} | POST | This service operation enables a UAE Server to notify a previously subscribed service consumer on UAV dynamic information event(s). |

#### 6.5.5.2 UAV Dynamic Information Notification

##### 6.5.5.2.1 Description

The UAV Dynamic Information Notification is used by the UAE Server to notify a previously subscribed service consumer on UAV dynamic information event(s).

##### 6.5.5.2.2 Target URI

The Callback URI **"{notifUri}"** shall be used with the callback URI variables defined in table 6.5.5.2.2-1.

Table 6.5.5.2.2-1: Callback URI variables

|  |  |
| --- | --- |
| Name | Definition |
| notifUri | Represents the callback URI encoded as a string formatted as a URI. |

##### 6.5.5.2.3 Standard Methods

###### 6.5.5.2.3.1 POST

This method shall support the request data structures specified in table 6.5.5.2.3.1-1 and the response data structures and response codes specified in table 6.5.5.2.3.1-2.

Table 6.5.5.2.3.1-1: Data structures supported by the POST Request Body

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| UAVDynInfoNotif | M | 1 | Represents the UAV Dynamic Information Notification. |

Table 6.5.5.2.3.1-2: Data structures supported by the POST Response Body

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response codes | Description |
| n/a |  |  | 204 No Content | Successful case. The UAV Dynamic Information Notification is successfully received and processed. |
| 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 service consumer towards which the notification should be sent.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [3]. |
| 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 service consumer towards which the notification should be sent.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [3]. |
| 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 6.5.5.2.3.1-3: Headers supported by the 307 Response Code on this resource

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

Table 6.5.5.2.3.1-4: Headers supported by the 308 Response Code on this resource

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

### 6.5.6 Data Model

#### 6.5.6.1 General

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

Table 6.5.6.1-1 specifies the data types defined for the UAE\_UAVDynamicInfo API.

Table 6.5.6.1-1: UAE\_UAVDynamicInfo API specific Data Types

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | Clause defined | Description | Applicability |
| ProxRangInfo | 6.5.6.2.5 | Represents the proximity range information. |  |
| UavDistance | 6.5.6.3.2 | Represents the linear distance between two UAVs. |  |
| UAVDynInfoNotif | 6.5.6.2.4 | Represents a UAV Dynamic Information Notification. |  |
| UAVDynInfoSubsc | 6.5.6.2.2 | Represents a UAV Dynamic Information Subscription. |  |
| UAVDynInfoSubscPatch | 6.5.6.2.3 | Represents the requested modifications to a UAV Dynamic Information Subscription. |  |
| UavInfo | 6.5.6.2.6 | Represents the UAV information related to the UAV detection in an application defined proximity range. |  |

Table 6.5.6.1-2 specifies data types re-used by the UAE\_UAVDynamicInfo API from other specifications, including a reference to their respective specifications, and when needed, a short description of their use within the UAE\_UAVDynamicInfo API.

Table 6.5.6.1-2: UAE\_UAVDynamicInfo 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 [18] | Represents the list of supported feature(s) and 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. |  |

#### 6.5.6.2 Structured data types

##### 6.5.6.2.1 Introduction

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

##### 6.5.6.2.2 Type: UAVDynInfoSubsc

Table 6.5.6.2.2-1: Definition of type UAVDynInfoSubsc

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| uavId | UavId | M | 1 | Contains the identity of the host UAV to which the UAV dynamic information subscription is related. |  |
| proxRangInfo | ProxRangInfo | M | 1 | Contains the application defined proximity range information indicating the range information over which the requested host UAV's dynamic information is required. |  |
| notifUri | Uri | M | 1 | Contains the URI via which the UAV dynamic information event(s) related notifications shall be delivered. |  |
| suppFeat | SupportedFeatures | C | 0..1 | Contains the list of supported features among the ones defined in clause 6.5.8.  This attribute shall be present only when feature negotiation needs to take place. |  |

##### 6.5.6.2.3 Type: UAVDynInfoSubscPatch

Table 6.5.6.2.3-1: Definition of type UAVDynInfoSubscPatch

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| proxRangInfo | ProxRangInfo | O | 0..1 | Contains the updated application defined proximity range information indicating the range information over which the requested host UAV's dynamic information is required. |  |
| notifUri | Uri | O | 0..1 | Contains the updated URI via which the UAV dynamic information event(s) related notifications shall be delivered. |  |

##### 6.5.6.2.4 Type: UAVDynInfoNotif

Table 6.5.6.2.4-1: Definition of type UAVDynInfoNotif

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| subscId | string | M | 1 | Contains the identifier of the UAV Dynamic Information Subscription to which the notification is related. |  |
| hostUavLoc | LocationInfo | M | 1 | Contains the location information for the host UAV. |  |
| uavsInfo | array(UavInfo) | M | 1..N | Contains a list of the UAV(s) detected in the application defined proximity range and the related information. |  |

##### 6.5.6.2.5 Type: ProxRangInfo

Table 6.5.6.2.5-1: Definition of type ProxRangInfo

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| range | number | O | 0..1 | Contains the application defined proximity range over which the requested host UAV's dynamic information is required.  (NOTE) |  |
| rangeInfo | string | O | 0..1 | Contains detailed and/or additional information on the application defined proximity range over which the requested host UAV's dynamic information is required.  (NOTE) |  |
| NOTE: At least one of these attributes shall be present. | | | | | |

##### 6.5.6.2.6 Type: UavInfo

Table 6.5.6.2.6-1: Definition of type UavInfo

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| nearbyUavId | UavId | M | 1 | Contains the identity of the nearby UAV to which the provided in formation is related. |  |
| nearbyUavLoc | LocationInfo | M | 1 | Contains the location information for the nearby UAV within the application defined proximity range. |  |
| nearbyUavDist | UavDistance | M | 1 | Contains the distance between the nearby UAV and the host UAV. |  |

#### 6.5.6.3 Simple data types and enumerations

##### 6.5.6.3.1 Introduction

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

##### 6.5.6.3.2 Simple data types

The simple data types defined in table 6.5.6.3.2-1 shall be supported.

Table 6.5.6.3.2-1: Simple data types

|  |  |  |  |
| --- | --- | --- | --- |
| Type Name | Type Definition | Description | Applicability |
| UavDistance | number | Represents the linear distance between two UAVs, expressed in meters. |  |

#### 6.5.6.4 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.

#### 6.5.6.5 Binary data

##### 6.5.6.5.1 Binary Data Types

Table 6.5.6.5.1-1: Binary Data Types

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

### 6.5.7 Error Handling

#### 6.5.7.1 General

For the UAE\_UAVDynamicInfo 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\_UAVDynamicInfo API.

#### 6.5.7.2 Protocol Errors

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

#### 6.5.7.3 Application Errors

The application errors defined for the UAE\_UAVDynamicInfo API are listed in Table 6.5.7.3-1.

Table 6.5.7.3-1: Application errors

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

### 6.5.8 Feature negotiation

The optional features listed in table 6.5.8-1 are defined for the UAE\_UAVDynamicInfo API. They shall be negotiated using the extensibility mechanism defined in clause 5.2.7 of 3GPP TS 29.122 [2].

Table 6.5.8-1: Supported Features

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

### 6.5.9 Security

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

## 6.6 UAE\_FlightPathMonitoring Service API

### 6.6.1 Introduction

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

The API URI of the UAE\_FlightPathMonitoring 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-fpm".

- 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 6.6, the UAE Server takes the role of the SCEF and the service consumer takes the role of the SCS/AS.

### 6.6.2 Usage of HTTP

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

### 6.6.3 Resources

#### 6.6.3.1 Overview

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

Figure 6.6.3.1-1 depicts the resource URIs structure for the UAE\_FlightPathMonitoring API.



Figure 6.6.3.1-1: Resource URIs structure of the UAE\_FlightPathMonitoring API

Table 6.6.3.1-1 provides an overview of the resources and applicable HTTP methods for the UAE\_FlightPathMonitoring API.

Table 6.6.3.1-1: Resources and methods overview

|  |  |  |  |
| --- | --- | --- | --- |
| Resource name | Resource URI | HTTP method or custom operation | Description |
| Flight Path Monitoring Configurations | /configurations | GET | Retrieve all the active Flight Path Monitoring Configurations managed by the UAE Server. |
| POST | Request the creation of a Flight Path Monitoring Configuration. |
| Individual Flight Path Monitoring Configuration | /configurations/{configId} | GET | Retrieve an existing "Individual Flight Path Monitoring Configuration" resource. |
| PUT | Request the update of an existing "Individual Flight Path Monitoring Configuration" resource. |
| PATCH | Request the modification of an existing "Individual Flight Path Monitoring Configuration" resource. |
| DELETE | Request the deletion of an existing "Individual Flight Path Monitoring Configuration" resource. |

#### 6.6.3.2 Resource: Flight Path Monitoring Configurations

##### 6.6.3.2.1 Description

This resource represents the collection of Flight Path Monitoring Configurations managed by the UAE Server.

##### 6.6.3.2.2 Resource Definition

Resource URI: **{apiRoot}/uae-fpm/<apiVersion>/configurations**

This resource shall support the resource URI variables defined in table 6.6.3.2.2-1.

Table 6.6.3.2.2-1: Resource URI variables for this resource

|  |  |  |
| --- | --- | --- |
| Name | Data type | Definition |
| apiRoot | string | See clause 6.6.1. |

##### 6.6.3.2.3 Resource Standard Methods

###### 6.6.3.2.3.1 GET

The HTTP GET method allows a service consumer to retrieve all the active Flight Path Monitoring Configurations managed by the UAE Server.

This method shall support the URI query parameters specified in table 6.6.3.2.3.1-1.

Table 6.6.3.2.3.1-1: 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 6.6.3.2.3.1-2 and the response data structures and response codes specified in table 6.6.3.2.3.1-3.

Table 6.6.3.2.3.1-2: Data structures supported by the GET Request Body on this resource

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

Table 6.6.3.2.3.1-3: Data structures supported by the GET Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response  codes | Description |
| array(FlightPathMonConfig) | M | 0..N | 200 OK | Successful case. All the active Flight Path Monitoring Configurations managed by the UAE Server shall be returned.  When there are no active Flight Path Monitoring Configurations at the UAE Server, an empty array 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 codes for the HTTP GET method listed in table 5.2.6-1 of 3GPP TS 29.122 [2] shall also apply. | | | | |

Table 6.6.3.2.3.1-4: Headers supported by the 307 Response Code on this resource

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

Table 6.6.3.2.3.1-5: Headers supported by the 308 Response Code on this resource

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

###### 6.6.3.2.3.2 POST

The HTTP POST method allows a service consumer to request the creation of a Flight Path Monitoring Configuration at the UAE Server.

This method shall support the URI query parameters specified in table 6.6.3.2.3.2-1.

Table 6.6.3.2.3.2-1: 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 6.6.3.2.3.2-2 and the response data structures and response codes specified in table 6.6.3.2.3.2-3.

Table 6.6.3.2.3.2-2: Data structures supported by the POST Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| FlightPathMonConfigReq | M | 1 | Represents the parameters to request the creation of a Flight Path Monitoring Configuration. |

Table 6.6.3.2.3.2-3: Data structures supported by the POST Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response  codes | Description |
| FlightPathMonConfigResp | M | 1 | 201 Created | Successful case. The Flight Path Monitoring Configuration is successfully created and a representation of the created "Individual Flight Path Monitoring Configuration" resource shall be returned.  An HTTP "Location" header that contains the URI of the created resource shall also be included. |
| 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 6.6.3.2.3.2-4: 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-fpm/<apiVersion>/configurations/{configId} |

##### 6.6.3.2.4 Resource Custom Operations

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

#### 6.6.3.3 Resource: Individual Flight Path Monitoring Configuration

##### 6.6.3.3.1 Description

This resource represents a Flight Path Monitoring Configuration managed by the UAE Server.

##### 6.6.3.3.2 Resource Definition

Resource URI: **{apiRoot}/uae-fpm/<apiVersion>/configurations/{configId}**

This resource shall support the resource URI variables defined in table 6.6.3.3.2-1.

Table 6.6.3.3.2-1: Resource URI variables for this resource

|  |  |  |
| --- | --- | --- |
| Name | Data type | Definition |
| apiRoot | string | See clause 6.6.1. |
| configId | string | Represents the identifier of the "Individual Flight Path Monitoring Configuration" resource. |

##### 6.6.3.3.3 Resource Standard Methods

###### 6.6.3.3.3.1 GET

The HTTP GET method allows a service consumer to retrieve an existing "Individual Flight Path Monitoring Configuration" resource at the UAE Server.

This method shall support the URI query parameters specified in table 6.6.3.3.3.1-1.

Table 6.6.3.3.3.1-1: 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 6.6.3.3.3.1-2 and the response data structures and response codes specified in table 6.6.3.3.3.1-3.

Table 6.6.3.3.3.1-2: Data structures supported by the GET Request Body on this resource

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

Table 6.6.3.3.3.1-3: Data structures supported by the GET Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response  codes | Description |
| FlightPathMonConfig | M | 1 | 200 OK | Successful case. The requested "Individual Flight Path Monitoring Configuration" 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 codes for the HTTP GET method listed in table 5.2.6-1 of 3GPP TS 29.122 [2] shall also apply. | | | | |

Table 6.6.3.3.3.1-4: Headers supported by the 307 Response Code on this resource

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

Table 6.6.3.3.3.1-5: Headers supported by the 308 Response Code on this resource

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

###### 6.6.3.3.3.2 PUT

The HTTP PUT method allows a service consumer to request the update of an existing "Individual Flight Path Monitoring Configuration" resource at the UAE Server.

This method shall support the URI query parameters specified in table 6.6.3.3.3.2-1.

Table 6.6.3.3.3.2-1: 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 6.6.3.3.3.2-2 and the response data structures and response codes specified in table 6.6.3.3.3.2-3.

Table 6.6.3.3.3.2-2: Data structures supported by the PUT Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| FlightPathMonConfig | M | 1 | Represents the updated representation of the "Individual Flight Path Monitoring Configuration" resource. |

Table 6.6.3.3.3.2-3: Data structures supported by the PUT Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response  codes | Description |
| FlightPathMonConfig | M | 1 | 200 OK | Successful case. The "Individual Flight Path Monitoring Configuration" 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 Flight Path Monitoring Configuration" 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 codes for the HTTP PUT method listed in table 5.2.6-1 of 3GPP TS 29.122 [2] shall also apply. | | | | |

Table 6.6.3.3.3.2-4: Headers supported by the 307 Response Code on this resource

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

Table 6.6.3.3.3.2-5: Headers supported by the 308 Response Code on this resource

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

###### 6.6.3.3.3.3 PATCH

The HTTP PATCH method allows a service consumer to request the modification of an existing "Individual Flight Path Monitoring Configuration" resource at the UAE Server.

This method shall support the URI query parameters specified in table 6.6.3.3.3.3-1.

Table 6.6.3.3.3.3-1: 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 6.6.3.3.3.3-2 and the response data structures and response codes specified in table 6.6.3.3.3.3-3.

Table 6.6.3.3.3.3-2: Data structures supported by the PATCH Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| FlightPathMonConfigPatch | M | 1 | Represents the parameters to request the modification of the "Individual Flight Path Monitoring Configuration" resource. |

Table 6.6.3.3.3.3-3: Data structures supported by the PATCH Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response  codes | Description |
| FlightPathMonConfig | M | 1 | 200 OK | Successful case. The "Individual Flight Path Monitoring Configuration" 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 Flight Path Monitoring Configuration" 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 codes for the HTTP PATCH method listed in table 5.2.6-1 of 3GPP TS 29.122 [2] shall also apply. | | | | |

Table 6.6.3.3.3.3-4: Headers supported by the 307 Response Code on this resource

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

Table 6.6.3.3.3.3-5: Headers supported by the 308 Response Code on this resource

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

###### 6.6.3.3.3.4 DELETE

The HTTP DELETE method allows a service consumer to request the deletion of an existing "Individual Flight Path Monitoring Configuration" resource at the UAE Server.

This method shall support the URI query parameters specified in table 6.6.3.3.3.4-1.

Table 6.6.3.3.3.4-1: 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 6.6.3.3.3.4-2 and the response data structures and response codes specified in table 6.6.3.3.3.4-3.

Table 6.6.3.3.3.4-2: Data structures supported by the DELETE Request Body on this resource

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

Table 6.6.3.3.3.4-3: 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 Flight Path Monitoring Configuration" 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 codes for the HTTP DELETE method listed in table 5.2.6-1 of 3GPP TS 29.122 [2] shall also apply. | | | | |

Table 6.6.3.3.3.4-4: Headers supported by the 307 Response Code on this resource

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

Table 6.6.3.3.3.4-5: Headers supported by the 308 Response Code on this resource

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

##### 6.6.3.3.4 Resource Custom Operations

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

### 6.6.4 Custom Operations without associated resources

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

### 6.6.5 Notifications

#### 6.6.5.1 General

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

Table 6.6.5.1-1: Notifications overview

|  |  |  |  |
| --- | --- | --- | --- |
| Notification | Callback URI | HTTP method or custom operation | Description  (service operation) |
| Flight Path Monitoring Configuration Completion Status Notification | {notifUri}/fpm-comp | fpm-comp (POST) | This service operation enables a UAE Server to notify a previously subscribed service consumer on the status of flight path monitoring configuration. |
| Flight Path Monitoring Events Notification | {notifUri}/fpm-events | fpm-events (POST) | This service operation enables a UAE Server to notify a previously subscribed service consumer of flight path monitoring event(s). |

#### 6.6.5.2 Flight Path Monitoring Configuration Completion Status Notification

##### 6.6.5.2.1 Description

The Flight Path Monitoring Configuration Completion Status Notification is used by a UAE Server to notify a previously subscribed service consumer on the status of flight path monitoring configuration.

##### 6.6.5.2.2 Target URI

The Callback URI **"{notifUri}**/**fpm-comp"** shall be used with the callback URI variables defined in table 6.6.5.2.2-1.

Table 6.6.5.2.2-1: Callback URI variables

|  |  |  |
| --- | --- | --- |
| Name | Data type | Definition |
| notifUri | Uri | Represents the callback URI encoded as a string formatted as a URI. |

##### 6.6.5.2.3 Standard Methods

###### 6.6.5.2.3.1 POST

This method shall support the request data structures specified in table 6.6.5.2.3.1-1 and the response data structures and response codes specified in table 6.6.5.2.3.1-2.

Table 6.6.5.2.3.1-1: Data structures supported by the POST Request Body

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| FlightPathMonConfigNotif | M | 1 | Represents the Flight Path Monitoring Configuration Completion Status Notification. |

Table 6.6.5.2.3.1-2: Data structures supported by the POST Response Body

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response codes | Description |
| n/a |  |  | 204 No Content | Successful case. The Flight Path Monitoring Configuration Completion 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 service consumer towards which 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 service consumer towards which 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 6.6.5.2.3.1-3: Headers supported by the 307 Response Code on this resource

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

Table 6.6.5.2.3.1-4: Headers supported by the 308 Response Code on this resource

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

#### 6.6.5.3 Flight Path Monitoring Events Notification

##### 6.6.5.3.1 Description

The Flight Path Monitoring Events Notification is used by a UAE Server to notify a previously subscribed service consumer of flight path monitoring event(s).

##### 6.6.5.3.2 Target URI

The Callback URI **"{notifUri}**/**fpm-events"** shall be used with the callback URI variables defined in table 6.6.5.3.2-1.

Table 6.6.5.3.2-1: Callback URI variables

|  |  |  |
| --- | --- | --- |
| Name | Data type | Definition |
| notifUri | Uri | Represents the callback URI encoded as a string formatted as a URI. |

##### 6.6.5.3.3 Standard Methods

###### 6.6.5.3.3.1 POST

This method shall support the request data structures specified in table 6.6.5.3.3.1-1 and the response data structures and response codes specified in table 6.6.5.3.3.1-2.

Table 6.6.5.3.3.1-1: Data structures supported by the POST Request Body

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| FlightPathMonNotif | M | 1 | Represents the Flight Path Monitoring Events Notification. |

Table 6.6.5.3.3.1-2: Data structures supported by the POST Response Body

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response codes | Description |
| n/a |  |  | 204 No Content | Successful case. The Flight Path Monitoring Events 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 service consumer towards which 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 service consumer towards which 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 6.6.5.3.3.1-3: Headers supported by the 307 Response Code on this resource

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

Table 6.6.5.3.3.1-4: Headers supported by the 308 Response Code on this resource

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

### 6.6.6 Data Model

#### 6.6.6.1 General

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

Table 6.6.6.1-1 specifies the data types defined for the UAE\_FlightPathMonitoring API.

Table 6.6.6.1-1: UAE\_FlightPathMonitoring API specific Data Types

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | Clause defined | Description | Applicability |
| FlightPathMonConfig | 6.6.6.2.4 | Represents a Flight Path Monitoring Configuration. |  |
| FlightPathMonConfigNotif | 6.6.6.2.9 | Represents a Flight Path Monitoring Configuration Completion Status Notification. |  |
| FlightPathMonConfigReq | 6.6.6.2.2 | Represents the parameters to request the creation of a Flight Path Monitoring Configuration. |  |
| FlightPathMonConfigResp | 6.6.6.2.3 | Represents the response to a Flight Path Monitoring Configuration creation request. |  |
| FlightPathMonConfigParams | 6.6.6.2.6 | Represents the flight path monitoring configuration parameters. |  |
| FlightPathMonConfigParamsRm | 6.6.6.2.7 | Represents the flight path monitoring configuration parameters.  This data type is defined in the same way as the FlightPathMonConfigParams data type but with the OpenAPI "nullable: true" property. |  |
| FlightPathMonConfigPatch | 6.6.6.2.5 | Represents the parameters to request the modification of a Flight Path Monitoring Configuration. |  |
| FlightPathMonConfigStatus | 6.6.6.3.3 | Represents the completion status of a Flight Path Monitoring Configuration. |  |
| FlightPathMonEvent | 6.6.6.3.4 | Represents a Flight Path Monitoring Event. |  |
| FlightPathMonEventInfo | 6.6.6.2.11 | Represents a Flight Path Monitoring Event report. |  |
| FlightPathMonNotif | 6.6.6.2.10 | Represents a Flight Path Monitoring Events Notification. |  |
| Waypoint | 6.6.6.2.8 | Represents a waypoint along a flight path. |  |

Table 6.6.6.1-2 specifies data types re-used by the UAE\_FlightPathMonitoring API from other specifications, including a reference to their respective specifications, and when needed, a short description of their use within the UAE\_FlightPathMonitoring API.

Table 6.6.6.1-2: UAE\_FlightPathMonitoring API re-used Data Types

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | Reference | Comments | Applicability |
| C2LinkQualityThrlds | Clause 6.1.6.2.11 | Represents the C2 link quality thresholds. |  |
| DateTime | 3GPP TS 29.122 [2] | Represents a date and a time. |  |
| GeographicArea | 3GPP TS 29.572 [8] | Represents a geographical area. |  |
| LocationInfo | 3GPP TS 29.122 [2] | Represents user location information. |  |
| ReportingInformation | 3GPP TS 29.523 [14] | Represents the event reporting requirements. |  |
| ServArea | Clause 6.3.6.2.7 | Represents a service area. |  |
| SupportedFeatures | 3GPP TS 29.571 [7] | Represents the list of supported feature(s) and used to negotiate the applicability of the optional features. |  |
| TimeWindow | 3GPP TS 29.122 [2] | Represents a time window. |  |
| UasId | Clause 6.1.6.2.6 | Represents a UAV identifier. |  |
| Uri | 3GPP TS 29.122 [2] | Represents a URI. |  |

#### 6.6.6.2 Structured data types

##### 6.6.6.2.1 Introduction

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

##### 6.6.6.2.2 Type: FlightPathMonConfigReq

Table 6.6.6.2.2-1: Definition of type FlightPathMonConfigReq

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| requestorId | Uri | M | 1 | Contains the identity of the service consumer that is sending the request. |  |
| monConfig | FlightPathMonConfig | M | 1 | Contains the Flight Path Monitoring Configuration that shall be created. |  |
| suppFeat | SupportedFeatures | C | 0..1 | Contains the list of supported features among the ones defined in clause 6.6.8.  This attribute shall be present only when feature negotiation is required. |  |

##### 6.6.6.2.3 Type: FlightPathMonConfigResp

Table 6.6.6.2.3-1: Definition of type FlightPathMonConfigResp

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| monConfig | FlightPathMonConfig | M | 1 | Contains the created Flight Path Monitoring Configuration. |  |
| suppFeat | SupportedFeatures | C | 0..1 | Contains the list of supported features among the ones defined in clause 6.6.8.  This attribute shall be present only when feature negotiation is required. |  |

##### 6.6.6.2.4 Type: FlightPathMonConfig

Table 6.6.6.2.4-1: Definition of type FlightPathMonConfig

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| uasId | UasId | M | 1 | Contains the identifier of the UAS to which the flight path monitoring configuration is related. |  |
| notifUri | Uri | M | 1 | Contains the notification URI via which the Flight Path Monitoring Configuration related notifications shall be delivered. |  |
| paramsUuPc5 | FlightPathMonConfigParams | C | 0..1 | Contains the flight path monitoring configuration related parameters applicable for both Uu and PC5 communications.  (NOTE) |  |
| paramsPc5 | FlightPathMonConfigParams | C | 0..1 | Contains the flight path monitoring configuration related parameters applicable for PC5 communications.  (NOTE) |  |
| NOTE: At least one of these attributes shall be present. When both these attributes are present, then the parameters provided within the "paramsUuPc5" attribute shall apply only for Uu communications and the parameters provided within the "paramsPc5" attribute shall apply for PC5 communications. | | | | | |

##### 6.6.6.2.5 Type: FlightPathMonConfigPatch

Table 6.6.6.2.5-1: Definition of type FlightPathMonConfigPatch

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| notifUri | Uri | O | 0..1 | Contains the updated notification URI via which the Flight Path Monitoring Configuration related notifications shall be delivered. |  |
| paramsUuPc5 | FlightPathMonConfigParamsRm | O | 0..1 | Contains the updated flight path monitoring configuration related parameters applicable for both Uu and PC5 communications. |  |
| paramsPc5 | FlightPathMonConfigParamsRm | O | 0..1 | Contains the updated flight path monitoring configuration related parameters applicable for PC5 communications. |  |

##### 6.6.6.2.6 Type: FlightPathMonConfigParams

Table 6.6.6.2.6-1: Definition of type FlightPathMonConfigParams

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability | |
| qosParams | C2LinkQualityThrlds | C | 0..1 | Contains the QoS parameters to be used for flight path monitoring configuration.  (NOTE) |  | |
| qoeParams | FFS | C | 0..1 | Contains the QoE parameters to be used for flight path monitoring configuration.  (NOTE) |  | |
| validity | TimeWindow | C | 0..1 | Contains the time window within which the flight path monitoring configuration parameters shall apply.  (NOTE) |  | |
| waypointsList | array(Waypoint) | C | 1..N | Contains one or several waypoint(s) along the UAS's flight path and within which the flight path monitoring configuration shall apply.  (NOTE) |  | |
| area | ServArea | C | 0..1 | Contains the area within which the flight path monitoring configuration shall apply.  (NOTE) |  |
| repReqs | ReportingInformation | C | 0..1 | Contains the reporting requirements to be used for flight path monitoring event(s) reporting.  (NOTE) |  |
| endOfSessRepInd | boolean | C | 0..1 | Indicates whether the flight path monitoring event(s) reporting shall be done only when the session with the UAE Client ends (e.g., when the flight mission of the UAS is over).  - "true" indicates that the flight path monitoring event(s) reporting shall be done only when the session with the UAE Client ends.  - "false" indicates that the flight path monitoring event(s) reporting shall not be done only when the session with the UAE Client ends.  - The default value is "false" when this attribute is omitted.  (NOTE) |  |
| NOTE: At least one of these attributes shall be present. | | | | | |

Editor’s Note: The encoding and content of the "qoeParams" attribute is FFS.

##### 6.6.6.2.7 Type: FlightPathMonConfigParamsRm

This data type is defined in the same way as the FlightPathMonConfigParams data type defined in clause 6.6.6.2.6 but with the OpenAPI "nullable: true" property.

##### 6.6.6.2.8 Type: Waypoint

Table 6.6.6.2.8-1: Definition of type Waypoint

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| location | GeographicArea | M | 1 | Contains geographical location of the waypoint. |  |
| time | DateTime | M | 1 | Contains the time of the waypoint. |  |

Editor's note: The definition of this data type is FFS.

##### 6.6.6.2.9 Type: FlightPathMonConfigNotif

Table 6.6.6.2.9-1: Definition of type FlightPathMonConfigNotif

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| status | FlightPathMonConfigStatus | M | 1 | Contains the the completion status of the Flight Path Monitoring Configuration. |  |

##### 6.6.6.2.10 Type: FlightPathMonNotif

Table 6.6.6.2.10-1: Definition of type FlightPathMonNotif

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| configId | string | M | 1 | Contains the identifier of the "Individual Flight Path Monitoring Configuration" resource to which the flight path monitoring event(s) notification is related. |  |
| reportsUuPc5 | array(FlightPathMonEventInfo) | C | 1..N | Contains the detected Flight Path Monitoring event(s) and the related information for Uu and PC5 communications.  (NOTE) |  |
| reportsPc5 | array(FlightPathMonEventInfo) | C | 1..N | Contains the detected Flight Path Monitoring event(s) and the related information for PC5 communications.  (NOTE) |  |
| NOTE: At least one of these attributes shall be present. When both these attributes are present, then the parameters provided within the "reportsUuPc5" attribute shall apply only for Uu communications and the parameters provided within the "reportsPc5" attribute shall apply for PC5 communications. | | | | | |

##### 6.6.6.2.11 Type: FlightPathMonEventInfo

Table 6.6.6.2.11-1: Definition of type FlightPathMonEventInfo

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| event | FlightPathMonEvent | M | 1 | Contains the reported flight path monitoring event. |  |
| timestamp | DateTime | O | 0..1 | Contains the time at which the reported event is received from the UAE Client. |  |
| location | LocationInfo | C | 0..1 | Contains the location of the UAE Client at the time the reported event is received from the UAE Client. |  |

Editor’s Note: The full content of this data type is FFS.

#### 6.6.6.3 Simple data types and enumerations

##### 6.6.6.3.1 Introduction

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

##### 6.6.6.3.2 Simple data types

The simple data types defined in table 6.6.6.3.2-1 shall be supported.

Table 6.6.6.3.2-1: Simple data types

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

##### 6.6.6.3.3 Enumeration: FlightPathMonConfigStatus

The enumeration FlightPathMonConfigStatus represents the completion status of a Flight Path Monitoring Configuration. It shall comply with the provisions defined in table 6.6.6.3.3-1.

Table 6.6.6.3.3-1: Enumeration FlightPathMonConfigStatus

|  |  |  |
| --- | --- | --- |
| Enumeration value | Description | Applicability |
| SUCCESSFUL | Indicates that the Flight Path Monitoring Configuration was successful. |  |
| NOT\_SUCCESSFUL | Indicates that the Flight Path Monitoring Configuration was not successful. |  |

##### 6.6.6.3.4 Enumeration: FlightPathMonEvent

The enumeration FlightPathMonEvent represents the Flight Path Monitoring event. It shall comply with the provisions defined in table 6.6.6.3.4-1.

Table 6.6.6.3.4-1: Enumeration FlightPathMonEvent

|  |  |  |
| --- | --- | --- |
| Enumeration value | Description | Applicability |
| QOS | Indicates that the Flight Path Monitoring event is a QoS event. |  |
| QOE | Indicates that the Flight Path Monitoring event is a QoE event. |  |
| WAYPOINT | Indicates that the Flight Path Monitoring event is a waypoint event. |  |
| AREA | Indicates that the Flight Path Monitoring event is an area event. |  |

#### 6.6.6.4 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.

#### 6.6.6.5 Binary data

##### 6.6.6.5.1 Binary Data Types

Table 6.6.6.5.1-1: Binary Data Types

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

### 6.6.7 Error Handling

#### 6.6.7.1 General

For the UAE\_FlightPathMonitoring 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\_FlightPathMonitoring API.

#### 6.6.7.2 Protocol Errors

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

#### 6.6.7.3 Application Errors

The application errors defined for the UAE\_FlightPathMonitoring API are listed in Table 6.6.7.3-1.

Table 6.6.7.3-1: Application errors

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

### 6.6.8 Feature negotiation

The optional features listed in table 6.6.8-1 are defined for the UAE\_FlightPathMonitoring API. They shall be negotiated using the extensibility mechanism defined in clause 5.2.7 of 3GPP TS 29.122 [2].

Table 6.6.8-1: Supported Features

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

### 6.6.9 Security

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

## 6.7 UAE\_FlightRouteSupport Service API

Editor’s Note: The content of this clause is FFS.

# 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: 1.2.0-alpha.1

description: |

UAE Server C2 Operation Mode Management Service.

© 2024, 3GPP Organizational Partners (ARIB, ATIS, CCSA, ETSI, TSDSI, TTA, TTC).

All rights reserved.

externalDocs:

description: >

3GPP TS 29.257 V19.0.0; 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 service consumer.

'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 service consumer.

'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 service consumer 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 service consumer 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'

c2DirectAvailRepReqs:

$ref: '#/components/schemas/C2DirectAvailRepReqs'

dualNetAssistC2Info:

$ref: '#/components/schemas/DualC2Data'

dualUTMNavC2Info:

$ref: '#/components/schemas/DualC2Data'

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'

utmNavC2LinkQualityThrlds:

$ref: '#/components/schemas/C2LinkQualityThrlds'

dualC2Link1QualityThrlds:

$ref: '#/components/schemas/C2LinkQualityThrlds'

dualC2SimuLinksQualityThrlds:

$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'

C2DirectAvailRepReqs:

description: >

Represents the "Direct C2 Communication" mode availability reporting requirements.

type: object

properties:

proseAppCodeSuffixPool:

$ref: 'TS29555\_N5g-ddnmf\_Discovery.yaml#/components/schemas/ProseApplicationCodeSuffixPool'

proseAppMasks:

type: array

items:

$ref: 'TS29555\_N5g-ddnmf\_Discovery.yaml#/components/schemas/ProseApplicationMask'

minItems: 1

validity:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/TimeWindow'

repReqs:

$ref: 'TS29523\_Npcf\_EventExposure.yaml#/components/schemas/ReportingInformation'

anyOf:

- required: [proseAppCodeSuffixPool]

- required: [validity]

- required: [repReqs]

DualC2Data:

description: >

Represents the Dual C2 communication mode related information.

type: object

properties:

link1C2SwitchPolicies:

$ref: '#/components/schemas/C2SwitchPolicies'

link1C2ServiceArea:

$ref: '#/components/schemas/C2ServiceArea'

link2C2SwitchPolicies:

$ref: '#/components/schemas/C2SwitchPolicies'

link2C2ServiceArea:

$ref: '#/components/schemas/C2ServiceArea'

anyOf:

- required: [link1C2SwitchPolicies]

- required: [link1C2ServiceArea]

- required: [link2C2SwitchPolicies]

- required: [link2C2ServiceArea]

# ENUMS:

C2CommMode:

anyOf:

- type: string

enum:

- DIRECT\_C2\_COMMUNICATION

- NETWORK\_ASSISTED\_C2\_COMMUNICATION

- NETWORK\_ASSISTED\_C2\_COMMUNICATION\_DUAL

- UTM\_NAVIGATED\_C2\_COMMUNICATION

- UTM\_NAVIGATED\_C2\_COMMUNICATION\_DUAL

- 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.

- NETWORK\_ASSISTED\_C2\_COMMUNICATION\_DUAL: Represents Network-Assisted C2 Communication mode

via a specific subscription/network (i.e., in case of Dual Network-Assisted C2

communications).

- UTM\_NAVIGATED\_C2\_COMMUNICATION: Indicates UTM-Navigated C2 communication mode.

- UTM\_NAVIGATED\_C2\_COMMUNICATION\_DUAL: Represents UTM-Navigated C2 Communication mode via

a specific subscription/network (i.e., in case of Dual UTM-Navigated C2communications).

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

- NETWORK\_ASSISTED\_TO\_NETWORK\_ASSISTED

- UTM\_NAVIGATED\_C2\_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.

- NETWORK\_ASSISTED\_TO\_NETWORK\_ASSISTED: Represents the C2 Communication Mode switching

between two Network-Assisted C2 Communication modes (e.g., via different

subscriptions/networks).

- UTM\_NAVIGATED\_C2\_TO\_UTM\_NAVIGATED\_C2: Represents the C2 Communication Mode switching

between two UTM-Navigated C2 Communication modes (e.g., via different

subscriptions/networks).

C2SwitchingCause:

anyOf:

- type: string

enum:

- DIRECT\_LINK\_QUALITY\_DEGRADATION

- DIRECT\_LINK\_AVAILABLE

- MOVING\_BVLOS

- LOCATION\_CHANGE

- TRAFFIC\_CONTROL\_NEEDED

- SECURITY\_REASONS

- ACTIVE\_LINK\_DEGRADATION

- 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.

- ACTIVE\_LINK\_DEGRADATION: Indicates that the C2 Communication Mode switching was triggered

due to a degradation of the active link in case of Dual C2 communications (e.g., Dual

Network-Assisted C2 communications, Dual UTM-Navigated C2 communications).

- 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: 1.1.0

description: |

UAE Server Real-time UAV Status Service.

© 2024, 3GPP Organizational Partners (ARIB, ATIS, CCSA, ETSI, TSDSI, TTA, TTC).

All rights reserved.

externalDocs:

description: >

3GPP TS 29.257 V18.4.0; 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'

'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'

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'

'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]

- anyOf:

- required: [uavLocInfo]

- required: [uavLocInfo, 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

description: |

UAE Server USS Change Management Service.

© 2024, 3GPP Organizational Partners (ARIB, ATIS, CCSA, ETSI, TSDSI, TTA, TTC).

All rights reserved.

externalDocs:

description: >

3GPP TS 29.257 V18.4.0; 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-ucm/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'

minItems: 0

'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'

callbacks:

USSChangeNotif:

'{$request.body#/ussChangePol/notifUri}':

post:

requestBody:

required: true

content:

application/json:

schema:

$ref: '#/components/schemas/USSChangeNotif'

responses:

'204':

description: >

No Content. The USS Change 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 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'

'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'

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'

'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'

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'

'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: Enables to request USS change.

operationId: RequestUSSChange

tags:

- USS Change Request

requestBody:

required: true

content:

application/json:

schema:

$ref: '#/components/schemas/USSChangeReq'

responses:

'204':

description: >

No Content. The USS change request is successfully received and processed.

'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:

#

# STRUCTURED DATA TYPES

#

USSChangePolReq:

description: >

Represents the parameters to request the creation/Update of a USS Change Policy.

type: object

properties:

requestorId:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/Uri'

ussChangePol:

$ref: '#/components/schemas/USSChangePolicy'

suppFeat:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/SupportedFeatures'

required:

- requestorId

- 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'

uasRegArea:

$ref: '#/components/schemas/ServArea'

uasAllowedRoute:

type: array

items:

$ref: '#/components/schemas/UasRoute'

minItems: 1

multiUssPol:

$ref: '#/components/schemas/MultiUssPol'

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'

uasRegArea:

$ref: '#/components/schemas/ServArea'

uasAllowedRoute:

type: array

items:

$ref: '#/components/schemas/UasRoute'

minItems: 1

multiUssPol:

$ref: '#/components/schemas/MultiUssPol'

MultiUssPol:

description: Represents a Multi-USS policy.

type: object

properties:

servingUssId:

$ref: '#/components/schemas/UssId'

servingUssInfo:

type: string

ussChangeArea:

$ref: '#/components/schemas/ServArea'

allowedTgtUsss:

type: array

items:

$ref: '#/components/schemas/UssInfo'

minItems: 1

required:

- servingUssId

- servingUssInfo

- ussChangeArea

ServArea:

description: Represents a service area.

type: object

properties:

ncgiList:

type: array

items:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/NcgiTai'

minItems: 1

description: List of NR cell Ids

taiList:

type: array

items:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/Tai'

minItems: 1

description: List of tracking area Ids

geographicAreaList:

type: array

items:

$ref: 'TS29572\_Nlmf\_Location.yaml#/components/schemas/GeographicArea'

minItems: 1

oneOf:

- anyOf:

- required: [ncgiList]

- required: [taiList]

- required: [geographicAreaList]

UasRoute:

description: Represents the UAS route.

type: object

properties:

route:

type: object

additionalProperties:

$ref: 'TS29572\_Nlmf\_Location.yaml#/components/schemas/GeographicArea'

minProperties: 2

description: >

Contains a list of two or more ordered geographic area(s) that constitute the UAS route.

The key of the map shall be an unsigned integer (with the minimum value being 1)

indicating the order of the geographic area, provided within the corresponding map

entry, in the derivation of the route, with the first map entry being the start of the

route and the last entry of the map being the end of the route.

required:

- route

UssInfo:

description: Represents USS information.

type: object

properties:

ussId:

$ref: '#/components/schemas/UssId'

ussServArea:

$ref: '#/components/schemas/ServArea'

ussServReqs:

type: array

items:

$ref: '#/components/schemas/ServReq'

minItems: 1

dnais:

type: array

items:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/Dnai'

minItems: 1

lunId:

type: string

required:

- ussId

- ussServArea

- ussServReqs

- dnais

- lunId

ServReq:

description: >

Represents a service requirement.

metric.

type: object

properties:

reqName:

type: string

reqValue:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/Bytes'

required:

- reqName

- reqValue

USSChangeReq:

description: Represents the parameters to request for USS change.

type: object

properties:

requestorId:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/Uri'

uasId:

$ref: 'TS29257\_UAE\_C2OperationModeManagement.yaml#/components/schemas/UasId'

targetUssId:

$ref: '#/components/schemas/UssId'

targetUssInfo:

$ref: '#/components/schemas/TgtUssInfo'

suppFeat:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/SupportedFeatures'

required:

- requestorId

- uasId

- targetUssId

TgtUssInfo:

description: Represents the target USS related information.

type: object

properties:

ussEdpt:

$ref: 'TS29558\_Eees\_EASRegistration.yaml#/components/schemas/EndPoint'

ussServReqs:

type: array

items:

$ref: '#/components/schemas/ServReq'

minItems: 1

dnais:

type: array

items:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/Dnai'

minItems: 1

lunId:

type: string

required:

- ussEdpt

USSChangeNotif:

description: Represents the USS Change Notification.

type: object

properties:

event:

$ref: '#/components/schemas/UssChangeEvent'

polConfigStatus:

type: boolean

default: false

description: >

Indicates the status of the USS change policy configuration.

true indicates that the USS change policy configuration was successful.

false indicates that the USS change policy configuration failed.

tgtUssId:

$ref: '#/components/schemas/UssId'

ussChgInfo:

$ref: '#/components/schemas/UssChgInfo'

required:

- event

UssChgInfo:

description: Represents the target USS related information.

type: object

properties:

servingUssId:

$ref: '#/components/schemas/UssId'

targetUssId:

$ref: '#/components/schemas/UssId'

lunId:

type: string

mobilityEvent:

$ref: '#/components/schemas/MobilityEvent'

required:

- servingUssId

# SIMPLE DATA TYPES

#

UssId:

description: >

Represents the identifier of a USS, encoded in the form of e.g., an FQDN, a URI, etc.

type: string

#

# ENUMERATIONS

#

UssChangeEvent:

anyOf:

- type: string

enum:

- USS\_CHG\_POL\_CONFIG\_STATUS

- UAE\_CLIENT\_ASSIST\_USS\_CHG

- UAE\_SERVER\_TRIGG\_USS\_CHG

- 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 a USS Change Event.

Possible values are:

- USS\_CHG\_POL\_CONFIG\_STATUS: Indicates that the USS Change Event is USS Change Policy

Configuration Status.

- UAE\_CLIENT\_ASSIST\_USS\_CHG: Indicates that the USS Change Event is UAE Client Assisted USS

Change.

- UAE\_SERVER\_TRIGG\_USS\_CHG: Indicates that the USS Change Event is UAE Server initiated

USS Change Trigger.

MobilityEvent:

anyOf:

- type: string

enum:

- OUT\_OF\_USS\_SERV\_AREA

- 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 a mobility event.

Possible values are:

- OUT\_OF\_USS\_SERV\_AREA: Indicates that the mobility event is the expected UAV mobility to a

service area that is outside the current serving USS's service area.

# A.5 UAE\_DAASupport API

openapi: 3.0.0

info:

title: UAE Server DAA Support Service

version: 1.1.0-alpha.1

description: |

UAE Server DAA Support Service.

© 2024, 3GPP Organizational Partners (ARIB, ATIS, CCSA, ETSI, TSDSI, TTA, TTC).

All rights reserved.

externalDocs:

description: >

3GPP TS 29.257 V19.0.0; 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.

When there are no active DAA Policies at the UAE Server, an empty array shall be

returned.

content:

application/json:

schema:

type: array

items:

$ref: '#/components/schemas/DAAPolicy'

minItems: 0

'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 Events Notification is successfully received and acknowledged, and

updated/additional DAA related event information is returned in the response body.

content:

application/json:

schema:

$ref: '#/components/schemas/DAAEventsInfo'

'204':

description: >

No Content. The DAA Events 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'

'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'

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'

'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'

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'

'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:

requestorId:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/Uri'

daaPol:

$ref: '#/components/schemas/DAAPolicy'

suppFeat:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/SupportedFeatures'

required:

- requestorId

- 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'

targetUasIds:

type: array

items:

$ref: 'TS29257\_UAE\_C2OperationModeManagement.yaml#/components/schemas/UasId'

minItems: 1

ldgsArea:

$ref: 'TS29257\_UAE\_ChangeUSSManagement.yaml#/components/schemas/ServArea'

notifUri:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/Uri'

daaAppPol:

$ref: '#/components/schemas/DAAAppPolicy'

required:

- uasId

- notifUri

- daaAppPol

DAAPolicyPatch:

description: >

Represents the parameters to request the modification of a DAA Policy.

type: object

properties:

targetUasIds:

type: array

items:

$ref: 'TS29257\_UAE\_C2OperationModeManagement.yaml#/components/schemas/UasId'

minItems: 1

ldgsArea:

$ref: 'TS29257\_UAE\_ChangeUSSManagement.yaml#/components/schemas/ServArea'

notifUri:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/Uri'

daaAppPol:

$ref: '#/components/schemas/DAAAppPolicy'

DAAAppPolicy:

description: Represents a DAA Application Policy.

type: object

properties:

polContainer:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/Bytes'

daaTriggThresholds:

type: string

validity:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/TimeWindow'

repReqs:

$ref: 'TS29523\_Npcf\_EventExposure.yaml#/components/schemas/ReportingInformation'

anyOf:

- required: [polContainer]

- required: [daaTriggThresholds]

- required: [validity]

- required: [repReqs]

InformDAAEventsReq:

description: Represents the parameters to report DAA related event(s).

type: object

properties:

requestorId:

$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:

- requestorId

- uasId

- daaEventsInfo

DAAPolConfigNotif:

description: Represents a DAA Policy Configuration Status Notification.

type: object

properties:

status:

$ref: '#/components/schemas/DAAPolConfigStatus'

required:

- status

DAAEventsInfo:

description: Represents a DAA Events Notification.

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 a DAA event related information.

type: object

properties:

uasId:

$ref: 'TS29257\_UAE\_C2OperationModeManagement.yaml#/components/schemas/UasId'

uasLocInfo:

$ref: 'TS29122\_MonitoringEvent.yaml#/components/schemas/LocationInfo'

alert:

$ref: '#/components/schemas/Alert'

entryTime:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/DateTime'

exitTime:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/DateTime'

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 the 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.

Alert:

anyOf:

- type: string

enum:

- RISK\_OF\_COLLISION

- COLLISION\_DETECTED

- COLLISION\_RESOLVED

- 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 LDGS-based DAA related alert.

Possible values are:

- RISK\_OF\_COLLISION: Indicates that the LDGS-based DAA related alert is risk of collision.

- COLLISION\_DETECTED: Indicates that the LDGS-based DAA related alert is collision detected.

- COLLISION\_RESOLVED: Indicates that the LDGS-based DAA related alert is collision (or risk

of collision) resolved.

# A.6 UAE\_UAVDynamicInfo API

openapi: 3.0.0

info:

title: UAE Server UAV Dynamic Information Service

version: 1.0.0

description: |

UAE Server UAV Dynamic Information Service.

© 2024, 3GPP Organizational Partners (ARIB, ATIS, CCSA, ETSI, TSDSI, TTA, TTC).

All rights reserved.

externalDocs:

description: >

3GPP TS 29.257 V18.4.0; 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-udi/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 UAV Dynamic Information Subscriptions managed by the UAE Server.

operationId: GetDynUavSubscs

tags:

- UAV Dynamic Information Subscriptions (Collection)

responses:

'200':

description: >

OK. All the active UAV Dynamic Information Subscriptions managed by the UAE Server shall

be returned.

When there are no active UAV Dynamic Information Subscriptions at the UAE Server, an

empty array shall be returned.

content:

application/json:

schema:

type: array

items:

$ref: '#/components/schemas/UAVDynInfoSubsc'

minItems: 0

'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 UAV Dynamic Information Subscription.

operationId: CreateDynUavSubsc

tags:

- UAV Dynamic Information Subscriptions (Collection)

requestBody:

required: true

content:

application/json:

schema:

$ref: '#/components/schemas/UAVDynInfoSubsc'

responses:

'201':

description: >

Created. The UAV Dynamic Information Subscription is successfully created and a

representation of the created Individual UAV Dynamic Information Subscription resource

shall be returned.

content:

application/json:

schema:

$ref: '#/components/schemas/UAVDynInfoSubsc'

headers:

Location:

description: >

Contains the URI of the created Individual UAV Dynamic Information 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:

UAVDynInfoNotif:

'{$request.body#/notifUri}':

post:

requestBody:

required: true

content:

application/json:

schema:

$ref: '#/components/schemas/UAVDynInfoNotif'

responses:

'204':

description: >

No Content. The UAV Dynamic Information 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/{subscId}:

parameters:

- name: subscId

in: path

description: >

Represents the identifier of the Individual UAV Dynamic Information Subscription resource.

required: true

schema:

type: string

get:

summary: Retrieve an existing Individual UAV Dynamic Information Subscription resource.

operationId: GetIndDynUavSubsc

tags:

- Individual UAV Dynamic Information Subscription (Document)

responses:

'200':

description: >

OK. The representation of the requested Individual UAV Dynamic Information Subscription

resource shall be returned.

content:

application/json:

schema:

$ref: '#/components/schemas/UAVDynInfoSubsc'

'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 UAV Dynamic Information Subscription resource.

operationId: UpdateIndDynUavSubsc

tags:

- Individual UAV Dynamic Information Subscription (Document)

requestBody:

required: true

content:

application/json:

schema:

$ref: '#/components/schemas/UAVDynInfoSubsc'

responses:

'200':

description: >

OK. The Individual UAV Dynamic Information Subscription 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/UAVDynInfoSubsc'

'204':

description: >

No Content. The Individual UAV Dynamic Information Subscription 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'

'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'

patch:

summary: Request the modification of an existing Individual UAV Dynamic Information Subscription resource.

operationId: ModifyIndDynUavSubsc

tags:

- Individual UAV Dynamic Information Subscription (Document)

requestBody:

required: true

content:

application/merge-patch+json:

schema:

$ref: '#/components/schemas/UAVDynInfoSubscPatch'

responses:

'200':

description: >

OK. The Individual UAV Dynamic Information Subscription 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/UAVDynInfoSubsc'

'204':

description: >

No Content. The Individual UAV Dynamic Information Subscription 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'

'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'

delete:

summary: Request the deletion of an existing Individual UAV Dynamic Information Subscription resource.

operationId: DeleteIndDynUavSubsc

tags:

- Individual UAV Dynamic Information Subscription (Document)

responses:

'204':

description: >

No Content. The Individual UAV Dynamic Information 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'

'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:

#

# STRUCTURED DATA TYPES

#

UAVDynInfoSubsc:

description: >

Represents a UAV Dynamic Information Subscription.

type: object

properties:

uavId:

$ref: 'TS29257\_UAE\_C2OperationModeManagement.yaml#/components/schemas/UavId'

proxRangInfo:

$ref: '#/components/schemas/ProxRangInfo'

notifUri:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/Uri'

suppFeat:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/SupportedFeatures'

required:

- uavId

- proxRangInfo

- notifUri

UAVDynInfoSubscPatch:

description: >

Represents the requested modifications to a UAV Dynamic Information Subscription.

type: object

properties:

proxRangInfo:

$ref: '#/components/schemas/ProxRangInfo'

notifUri:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/Uri'

UAVDynInfoNotif:

description: >

Represents a UAV Dynamic Information Notification.

type: object

properties:

subscId:

type: string

hostUavLoc:

$ref: 'TS29122\_MonitoringEvent.yaml#/components/schemas/LocationInfo'

uavsInfo:

type: array

items:

$ref: '#/components/schemas/UavInfo'

minItems: 1

required:

- subscId

- hostUavLoc

- uavsInfo

ProxRangInfo:

description: >

Represents the proximity range information.

type: object

properties:

range:

type: number

format: double

minimum: 0

rangeInfo:

type: string

anyOf:

- required: [range]

- required: [rangeInfo]

UavInfo:

description: >

Represents the UAV information related to the UAV detection in an application defined

proximity range.

type: object

properties:

nearbyUavId:

$ref: 'TS29257\_UAE\_C2OperationModeManagement.yaml#/components/schemas/UavId'

nearbyUavLoc:

$ref: 'TS29122\_MonitoringEvent.yaml#/components/schemas/LocationInfo'

nearbyUavDist:

$ref: '#/components/schemas/UavDistance'

required:

- nearbyUavId

- nearbyUavLoc

- nearbyUavDist

# SIMPLE DATA TYPES

#

UavDistance:

description: >

Represents the linear distance between two UAVs.

type: number

format: double

minimum: 0

#

# ENUMERATIONS

#

# A.7 UAE\_FlightPathMonitoring API

openapi: 3.0.0

info:

title: UAE Server Flight Path Monitoring Service

version: 1.0.0-alpha.1

description: |

UAE Server Flight Path Monitoring Service.

© 2024, 3GPP Organizational Partners (ARIB, ATIS, CCSA, ETSI, TSDSI, TTA, TTC).

All rights reserved.

externalDocs:

description: >

3GPP TS 29.257 V19.0.0; 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-fpm/v1'

variables:

apiRoot:

default: https://example.com

description: apiRoot as defined in clause 5.2.4 of 3GPP TS 29.122

security:

- {}

- oAuth2ClientCredentials: []

paths:

/configurations:

get:

summary: Retrieve all the active Flight Path Monitoring Configurations managed by the UAE Server.

operationId: FlightPathMonConfigs

tags:

- Flight Path Monitoring Configurations (Collection)

responses:

'200':

description: >

OK. All the active Flight Path Monitoring Configurations managed by the UAE Server shall

be returned.

When there are no active Flight Path Monitoring Configurations at the UAE Server, an

empty array shall be returned.

content:

application/json:

schema:

type: array

items:

$ref: '#/components/schemas/FlightPathMonConfig'

minItems: 0

'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 Flight Path Monitoring Configuration.

operationId: CreateFlightPathMonConfig

tags:

- Flight Path Monitoring Configurations (Collection)

requestBody:

required: true

content:

application/json:

schema:

$ref: '#/components/schemas/FlightPathMonConfigReq'

responses:

'200':

description: >

OK. The Flight Path Monitoring Configuration is successfully created and a

representation of the created Individual Flight Path Monitoring Configuration resource

shall be returned.

content:

application/json:

schema:

$ref: '#/components/schemas/FlightPathMonConfigResp'

headers:

Location:

description: >

Contains the URI of the created Individual Flight Path Monitoring Configuration

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:

FlightPathMonConfigCompNotif:

'{$request.body#/monConfig/notifUri}/fpm-comp':

post:

requestBody:

required: true

content:

application/json:

schema:

$ref: '#/components/schemas/FlightPathMonConfigNotif'

responses:

'204':

description: >

No Content. The Flight Path Monitoring Configuration Completion 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'

FlightPathMonEventsNotif:

'{$request.body#/monConfig/notifUri}/fpm-events':

post:

requestBody:

required: true

content:

application/json:

schema:

$ref: '#/components/schemas/FlightPathMonNotif'

responses:

'204':

description: >

No Content. The Flight Path Monitoring Events 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'

/configurations/{configId}:

parameters:

- name: configId

in: path

description: >

Represents the identifier of the Individual Flight Path Monitoring Configuration resource.

required: true

schema:

type: string

get:

summary: Retrieve an existing Individual Flight Path Monitoring Configuration resource.

operationId: GetIndFlightPathMonConfig

tags:

- Individual Flight Path Monitoring Configuration (Document)

responses:

'200':

description: >

OK. The requested Individual Flight Path Monitoring Configuration resource shall be

returned.

content:

application/json:

schema:

$ref: '#/components/schemas/FlightPathMonConfig'

'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 Flight Path Monitoring Configuration resource.

operationId: UpdateIndFlightPathMonConfig

tags:

- Individual Flight Path Monitoring Configuration (Document)

requestBody:

required: true

content:

application/json:

schema:

$ref: '#/components/schemas/FlightPathMonConfig'

responses:

'200':

description: >

OK. The Individual Flight Path Monitoring Configuration resource is successfully updated

and arepresentation of the updated resource shall be returned in the response body.

content:

application/json:

schema:

$ref: '#/components/schemas/FlightPathMonConfig'

'204':

description: >

No Content. The Individual Flight Path Monitoring Configuration 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'

'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'

patch:

summary: Request the modification of an existing Individual Flight Path Monitoring Configuration resource.

operationId: ModifyIndFlightPathMonConfig

tags:

- Individual Flight Path Monitoring Configuration (Document)

requestBody:

required: true

content:

application/merge-patch+json:

schema:

$ref: '#/components/schemas/FlightPathMonConfigPatch'

responses:

'200':

description: >

OK. The Individual Flight Path Monitoring Configuration resource is successfully

modified and arepresentation of the updated resource shall be returned in the response

body.

content:

application/json:

schema:

$ref: '#/components/schemas/FlightPathMonConfig'

'204':

description: >

No Content. The Individual Flight Path Monitoring Configuration 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'

'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'

delete:

summary: Request the deletion of an existing Individual Flight Path Monitoring Configuration resource.

operationId: DeleteIndFlightPathMonConfig

tags:

- Individual Flight Path Monitoring Configuration (Document)

responses:

'204':

description: >

No Content. The Individual Flight Path Monitoring Configuration 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'

'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:

#

# STRUCTURED DATA TYPES

#

FlightPathMonConfigReq:

description: >

Represents the parameters to request the creation of a Flight Path Monitoring Configuration.

type: object

properties:

requestorId:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/Uri'

monConfig:

$ref: '#/components/schemas/FlightPathMonConfig'

suppFeat:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/SupportedFeatures'

required:

- requestorId

- monConfig

FlightPathMonConfigResp:

description: >

Represents the response to a Flight Path Monitoring Configuration creation request.

type: object

properties:

monConfig:

$ref: '#/components/schemas/FlightPathMonConfig'

suppFeat:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/SupportedFeatures'

required:

- monConfig

FlightPathMonConfig:

description: Represents a Flight Path Monitoring Configuration.

type: object

properties:

uasId:

$ref: 'TS29257\_UAE\_C2OperationModeManagement.yaml#/components/schemas/UasId'

notifUri:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/Uri'

paramsUuPc5:

$ref: '#/components/schemas/FlightPathMonConfigParams'

paramsPc5:

$ref: '#/components/schemas/FlightPathMonConfigParams'

anyOf:

- required: [paramsUuPc5]

- required: [paramsPc5]

FlightPathMonConfigPatch:

description: >

Represents the parameters to request the modification of a Flight Path Monitoring

Configuration.

type: object

properties:

notifUri:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/Uri'

paramsUuPc5:

$ref: '#/components/schemas/FlightPathMonConfigParams'

paramsPc5:

$ref: '#/components/schemas/FlightPathMonConfigParams'

FlightPathMonConfigParams:

description: Represents the flight path monitoring configuration parameters.

type: object

properties:

qosParams:

$ref: 'TS29257\_UAE\_C2OperationModeManagement.yaml#/components/schemas/C2LinkQualityThrlds'

validity:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/TimeWindow'

waypointsList:

type: array

items:

$ref: '#/components/schemas/Waypoint'

minItems: 1

area:

$ref: 'TS29257\_UAE\_ChangeUSSManagement.yaml#/components/schemas/ServArea'

repReqs:

$ref: 'TS29523\_Npcf\_EventExposure.yaml#/components/schemas/ReportingInformation'

endOfSessRepInd:

type: boolean

default: false

description: >

Indicates whether the flight path monitoring event(s) reporting shall be done only when

the session with the UAE Client ends (e.g., when the flight mission of the UAS is over).

true indicates that the flight path monitoring event(s) reporting shall be done only

when the session with the UAE Client ends.

false indicates that the flight path monitoring event(s) reporting shall be done only

when the session with the UAE Client ends.

The default value is "false" when this attribute is omitted.

anyOf:

- required: [qosParams]

- required: [validity]

- required: [waypointsList]

- required: [area]

- required: [repReqs]

- required: [endOfSessRepInd]

FlightPathMonConfigParamsRm:

description: >

Represents the flight path monitoring configuration parameters.

This data type is defined in the same way as the FlightPathMonConfigParams data type but

with the OpenAPI nullable property set to true.

type: object

properties:

qosParams:

$ref: 'TS29257\_UAE\_C2OperationModeManagement.yaml#/components/schemas/C2LinkQualityThrlds'

validity:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/TimeWindow'

waypointsList:

type: array

items:

$ref: '#/components/schemas/Waypoint'

minItems: 1

area:

$ref: 'TS29257\_UAE\_ChangeUSSManagement.yaml#/components/schemas/ServArea'

repReqs:

$ref: 'TS29523\_Npcf\_EventExposure.yaml#/components/schemas/ReportingInformation'

endOfSessRepInd:

type: boolean

default: false

description: >

Indicates whether the flight path monitoring event(s) reporting shall be done only when

the session with the UAE Client ends (e.g., when the flight mission of the UAS is over).

true indicates that the flight path monitoring event(s) reporting shall be done only

when the session with the UAE Client ends.

false indicates that the flight path monitoring event(s) reporting shall be done only

when the session with the UAE Client ends.

The default value is "false" when this attribute is omitted.

nullable: true

anyOf:

- required: [qosParams]

- required: [validity]

- required: [waypointsList]

- required: [area]

- required: [repReqs]

- required: [endOfSessRepInd]

Waypoint:

description: Represents a waypoint along a flight path.

type: object

properties:

location:

$ref: 'TS29572\_Nlmf\_Location.yaml#/components/schemas/GeographicArea'

time:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/DateTime'

required:

- location

- time

FlightPathMonConfigNotif:

description: >

Represents a Flight Path Monitoring Configuration Completion Status Notification.

type: object

properties:

status:

$ref: '#/components/schemas/FlightPathMonConfigStatus'

required:

- status

FlightPathMonNotif:

description: Represents a Flight Path Monitoring Events Notification.

type: object

properties:

configId:

type: string

reportsUuPc5:

type: array

items:

$ref: '#/components/schemas/FlightPathMonEventInfo'

minItems: 1

reportsPc5:

type: array

items:

$ref: '#/components/schemas/FlightPathMonEventInfo'

minItems: 1

required:

- configId

anyOf:

- required: [reportsUuPc5]

- required: [reportsPc5]

FlightPathMonEventInfo:

description: Represents a Flight Path Monitoring Event report.

type: object

properties:

event:

$ref: '#/components/schemas/FlightPathMonEvent'

timestamp:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/DateTime'

location:

$ref: 'TS29122\_MonitoringEvent.yaml#/components/schemas/LocationInfo'

required:

- event

# SIMPLE DATA TYPES

#

#

# ENUMERATIONS

#

FlightPathMonConfigStatus:

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 DAA Policy configuration completion status.

Possible values are:

- SUCCESSFUL: Indicates that the Flight Path Monitoring Configuration was successful.

- NOT\_SUCCESSFUL: Indicates that the Flight Path Monitoring Configuration was not

successful.

FlightPathMonEvent:

anyOf:

- type: string

enum:

- QOS

- QOE

- WAYPOINT

- AREA

- 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 Flight Path Monitoring event.

Possible values are:

- QOS: Indicates that the Flight Path Monitoring event is a QoS event.

- QOE: Indicates that the Flight Path Monitoring event is a QoE event.

- WAYPOINT: Indicates that the Flight Path Monitoring event is a waypoint event.

- AREA: Indicates that the Flight Path Monitoring event is an area event.

# A.8 UAE\_FlightRouteSupport API

Editor’s Note: The content of this Annex is FFS.

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.4-1 are withdrawn for the UAE\_ChangeUSSManagement API.

Table B.4-1: Withdrawn API versions of the UAE\_ChangeUSSManagement service

|  |  |
| --- | --- |
| API version number | Remarks |
|  |  |

# B.5 UAE\_DAASupport API

The API versions listed in table B.5-1 are withdrawn for the UAE\_DAASupport API.

Table B.5-1: Withdrawn API versions of the UAE\_DAASupport service

|  |  |
| --- | --- |
| API version number | Remarks |
|  |  |

# B.6 UAE\_UAVDynamicInfo API

The API versions listed in table B.6-1 are withdrawn for the UAE\_UAVDynamicInfo API.

Table B.6-1: Withdrawn API versions of the UAE\_UAVDynamicInfo service

|  |  |
| --- | --- |
| API version number | Remarks |
|  |  |

# B.7 UAE\_FlightPathMonitoring API

The API versions listed in table B.7-1 are withdrawn for the UAE\_FlightPathMonitoring API.

Table B.7-1: Withdrawn API versions of the UAE\_FlightPathMonitoring service

|  |  |
| --- | --- |
| API version number | Remarks |
|  |  |

# B.8 UAE\_FlightRouteSupport API

The API versions listed in table B.8-1 are withdrawn for the UAE\_FlightRouteSupport API.

Table B.8-1: Withdrawn API versions of the UAE\_FlightRouteSupport 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 |
| 2024-03 | CT#103 | CP-240171 | 0021 | 1 | F | Various corrections | 18.3.0 |
| 2024-03 | CT#103 | CP-240194 | 0022 |  | B | Complete the definition of the UAE\_ChangeUSSManagement API | 18.3.0 |
| 2024-03 | CT#103 | CP-240194 | 0023 |  | B | Complete the definition of the UAE\_DAASupport API | 18.3.0 |
| 2024-03 | CT#103 | CP-240243 | 0024 | 1 | B | Define the UAE\_UAVDynamicInfo API | 18.3.0 |
| 2024-03 | CT#103 | CP-240166 | 0025 |  | F | Update of info and externalDocs fields | 18.3.0 |
| 2024-06 | CT#104 | CP-241083 | 0026 |  | F | Corrections to UAE\_RealtimeUAVStatus API | 18.4.0 |
| 2024-06 | CT#104 | CP-241112 | 0027 | 1 | F | Corrections to UAE\_ChangeUSSManagement API | 18.4.0 |
| 2024-06 | CT#104 | CP-241112 | 0028 | 3 | F | Corrections to UAE\_DAASupport API | 18.4.0 |
| 2024-06 | CT#104 | CP-241112 | 0029 | 1 | F | Corrections to UAE\_UAVDynamicInfo API | 18.4.0 |
| 2024-06 | CT#104 | CP-241083 | 0030 | 1 | F | Cardinality of attributes in RTUavStatus object | 18.4.0 |
| 2024-06 | CT#104 | CP-241125 | 0032 | 1 | A | Presence conditions of attributes in RTUavStatus object | 18.4.0 |
| 2024-06 | CT#104 | CP-241112 | 0033 | 1 | F | Corrections to UAE\_ChangeUSSManagement data model and open API | 18.4.0 |
| 2024-06 | CT#104 | CP-241084 | 0034 | 1 | F | Define the topological area/location information terminology | 18.4.0 |
| 2024-06 | CT#104 | CP-241112 | 0035 |  | F | Various essential corrections to the UAE\_ChangeUSSManagement API | 18.4.0 |
| 2024-06 | CT#104 | CP-241112 | 0036 |  | F | Various essential corrections to the UAE\_DAASupport API | 18.4.0 |
| 2024-06 | CT#104 | CP-241112 | 0037 |  | F | Various essential corrections to the UAE\_UAVDynamicInfo API | 18.4.0 |
| 2024-06 | CT#104 | CP-241085 | 0039 |  | F | Update of info and externalDocs fields | 18.4.0 |
| 2024-09 | CT#105 | CP-242129 | 0040 | 1 | B | Support Dual Network-Assisted C2 communications | 19.0.0 |
| 2024-09 | CT#105 | CP-242129 | 0041 | 1 | B | Support for DAA LDGS | 19.0.0 |
| 2024-09 | CT#105 | CP-242129 | 0042 |  | B | Define the service description clauses of the UAE\_FlightPathMonitoring API | 19.0.0 |
| 2024-09 | CT#105 | CP-242129 | 0043 | 1 | B | Define the API definition clauses of the UAE\_FlightPathMonitoring API | 19.0.0 |
| 2024-09 | CT#105 | CP-242129 | 0044 |  | B | Define the OpenAPI description of the UAE\_FlightPathMonitoring API | 19.0.0 |
| 2024-09 | CT#105 | CP-242129 | 0045 |  | B | Start the definition of the UAE\_FlightRouteSupport API | 19.0.0 |
| 2024-09 | CT#105 | CP-242121 | 0046 | 1 | B | Necessary updates and corrections to C2 Communication Mode management procedures | 19.0.0 |
| 2024-09 | CT#105 | CP-242113 | 0047 |  | B | Update of info and externalDocs fields | 19.0.0 |