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Foreword

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

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

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 APIs for enabling the edge applications over 3GPP networks. The application layer architecture, functional requirements, procedures and information flows necessary for enabling edge applications over 3GPP networks are specified in 3GPP TS 23.558 [2]. The APIs are specified as RESTful APIs except for custom operations wherever required.

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 document *in the same Release as the present document*.

- [1] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications".
- [2] 3GPP TS 23.558: "Architecture for enabling Edge Applications".
- [3] Open API: "OpenAPI Specification Version 3.0.0.", <https://spec.openapis.org/oas/v3.0.0>.
- [4] 3GPP TR 21.900: "Technical Specification Group working methods".
- [5] 3GPP TS 29.501: "5G System; Principles and Guidelines for Services Definition; Stage 3".
- [6] 3GPP TS 29.122: "T8 reference point for Northbound Application Programming Interfaces (APIs)".
- [7] IETF RFC 6455: "The WebSocket Protocol".
- [8] 3GPP TS 29.571: "5G System; Common Data Types for Service Based Interfaces; Stage 3".
- [9] 3GPP TS 29.510: "5G System; Network Function Repository Services; Stage 3".
- [10] 3GPP TS 29.522: "5G System; Network Exposure Function Northbound APIs; Stage 3".
- [11] 3GPP TS 29.572: "5G System; Location Management Services; Stage 3".
- [12] 3GPP TS 29.520: "5G System; Network Data Analytics Services; Stage 3".
- [13] 3GPP TS 29.523: "5G System; Policy Control Event Exposure Service; Stage 3".
- [14] 3GPP TS 24.558: "Enabling Edge Applications; Protocol specification".
- [15] 3GPP TS 29.214: "Policy and charging control over Rx reference point".
- [16] 3GPP TS 29.514: "5G System; Policy Authorization Service; Stage 3".
- [17] 3GPP TS 29.222: "Common API Framework for 3GPP Northbound APIs".
- [18] 3GPP TS 33.122: "Security Aspects of Common API Framework for 3GPP Northbound APIs".
- [19] IETF RFC 6749: "The OAuth 2.0 Authorization Framework".
- [20] 3GPP TS 33.558: "Security aspects of enhancement of support for enabling edge applications; Stage 2".
- [21] Void.

- [22] 3GPP TS 29.503: "5G System; Unified Data Management Services; Stage 3".
- [23] 3GPP TS 23.271: "Functional stage 2 description of Location Services (LCS)".
- [24] 3GPP TS 23.273: "5G System (5GS) Location Services (LCS); Stage 2".
- [25] IETF RFC 6733: "Diameter Base Protocol".

3 Definitions of terms, symbols and abbreviations

3.1 Terms

For the purposes of the present document, the terms 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 purposes of the present document, the following terms and its definitions given in 3GPP TS 23.558 [2] shall apply:

Application Context

Application Context Relocation

Application Context Transfer

Application Server

Edge Computing Service Provider

Edge Data Network

EEC Context

Edge Hosting Environment

Instantiable EAS

Partner ECS

Partner ECSP

3.2 Symbols

For the purposes of the present document, the following symbols apply:

<symbol> <Explanation>

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].

AC	Application Client
ACID	Application Client Identification
ACR	Application Context Relocation
AEF	API Exposing Function
AF	Application Function
ASP	Application Service Provider

CAPIF	Common API Framework
CAS	Cloud Application Server
CES	Cloud Enabler Server
DN	Data Network
DNAI	Data Network Access Identifier
DNN	Data Network Name
EAS	Edge Application Server
EASID	Edge Application Server Identification
ECI	Edge and Cloud Interworking
ECS	Edge Configuration Server
ECSP	Edge Computing Service Provider
EDN	Edge Data Network
EEC	Edge Enabler Client
EECID	Edge Enabler Client Identification
EEL	Edge Enabler Layer
EES	Edge Enabler Server
EESID	Edge Enabler Server Identification
EHE	Edge Hosting Environment
FQDN	Fully Qualified Domain Name
GPSI	Generic Public Subscription Identifier
LADN	Local Area Data Network
NEF	Network Exposure Function
NID	Network Identifier
PCF	Policy Control Function
S-EAS	Source Edge Application Server
S-EES	Source Edge Enabler Server
SCEF	Service Capability Exposure Function
SEAL	Service Enabler Architecture Layer for Verticals
SEALDD	SEAL Data Delivery
SMF	Session Management Function
SNPN	Stand-alone Non-Public Network
SSID	Service Set Identifier
T-EAS	Target Edge Application Server
T-EES	Target Edge Enabler Server
TAI	Tracking Area Identity
UAS	Uncrewed Aerial System

4 Overview

3GPP TS 23.558 [2] has specified the application layer architecture, requirements, procedures, information flows and the APIs, in order to support the edge applications over the 3GPP systems. Various features are defined to ensure the efficient use and deployment of edge applications, some of which include, registration, discovery, service provisioning, capability exposure, support for service continuity and support for roaming and federation.

The present document specifies the north-bound APIs in detail, needed to support the services offered by EES and ECS over EDGE-3/6/9/10 interfaces and by CES and CAS over ECI-1/2/3/4 interfaces for enabling the edge applications over 3GPP network.

5 Services offered by Edge Enabler Server

5.1 Introduction

The table 5.1-1 lists the Edge Enabler Server APIs below the service name. A service description clause for each API gives a general description of the related API.

Table 5.1-1: List of EES Service APIs

Service Name	Service Operations	Operation Semantics	Consumer(s)
Eees_EASRegistration	Request	Request/Response	EAS
	Update	Request/Response	EAS
	Deregister	Request/Response	EAS
Eees_UELocation	Get	Request/Response	EAS
	Subscribe	Subscribe/Notify	EAS
	Notify		
	UpdateSubscription		
	Unsubscribe		
Eees_UEIdentifier	Get	Request/Response	EAS, EEC
Eees_AppClientInformation	Subscribe	Subscribe/Notify	EAS
	Notify		
	UpdateSubscription		
	Unsubscribe		
Eees_SessionWithQoS	Create	Request/Response	EAS
	Update	Request/Response	EAS
	Revoke	Request/Response	EAS
	Notify	Subscribe/Notify	EAS
Eees_EASDiscovery	TEasDiscRequest	Request/Response	EAS, EES, CAS
Eees_ACRManagementEvent	Subscribe	Subscribe/Notify	EAS, CAS
	Notify		
	UpdateSubscription		
	Unsubscribe		
Eees_EECContextRelocation	Push	Request/Response	EES, CES
	Pull	Request/Response	EES
Eees_EELManagedACR	Request	Request/Response	EAS
	Subscribe	Subscribe/Notify	EAS
	Notify		
Eees_ACRStatusUpdate	Request	Request/Response	EAS, CAS
Eees_AppContextRelocation	ACRDetermination_Req est	Request/Response	EAS
	SelectedTargetEAS_Decl are	Request/Response	EAS, CAS
Eees_ACRParameterInformation	Request	Request/Response	EES, CES
Eees_CommonEASAnnouncement	Declare	Request/Response	EES
Eees_TrafficInfluenceEAS	Manage	Request/Response	EAS

Table 5.1-2 summarizes the corresponding Edge Enabler Server APIs defined in this specification.

Table 5.1-2: API Descriptions

Service Name	Clause	Description	OpenAPI Specification File	apiName	Annex
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Eees_EASRegistration	5.2	EES EAS registration service	TS29558_Eees_EASRegistration.yaml	eees-easregistration	A.2
Eees_UELocation	5.3	EES Service for fetching UE location information	TS29558_Eees_UELocation.yaml	eees-uelocation	A.3
Eees_UEIdentifier	5.4	EES Service for fetching UE identifier.	TS29558_Eees_UEIdentifier.yaml	eees-ueidentifier	A.4
Eees_AppClientInformation	5.5	EES Service to obtain the capabilities of the ACs.	TS29558_Eees_AppClientInformation.yaml	eees-appclientinformation	A.5
Eees_SessionWithQoS	5.6	EES Service to setup data session between AC and EAS with specific QoS.	TS29558_Eees_SessionWithQoS.yaml	eees-session-with-qos	A.6
Eees_ACRManagementEvent	5.8	EES Service to receive notification related to ACR management events.	TS29558_Eees_ACRManagementEvent.yaml	eees-acrmgmtevent	A.7
Eees_EECContextRelocation	5.10	EES Service to push or pull EEC context information.	TS29558_Eees_EECContextRelocation.yaml	eees-eecontextreloc	A.8
Eees_EELManagedACR	5.11	EES Service to request for handling of ACR related operations and receive ACT notifications.	TS29558_Eees_EELManagedACR.yaml	eees-eel-acr	A.9
Eees_ACRStatusUpdate	5.12	EES Service to update the status of ACR.	TS29558_Eees_ACRStatusUpdate.yaml	eees-acrstatus-update	A.10
Eees_ACRParameterInformation	5.13	EES Service to send ACR parameters information.	TS29558_Eees_ACRParameterInformation.yaml	eees-acr-param	A.13
Eees_CommonEASAnnouncement	5.14	EES Common EAS Announcement Service	TS29558_Eees_CommonEASAnnouncement.yaml	eees-cea	A.15
Eees_TrafficInfluenceEAS	5.15	Service to trigger application traffic influence	TS29558_Eees_TrafficInfluenceEAS.yaml	eees-tie	A.17

5.2 Eees_EASRegistration Service

5.2.1 Service Description

The Eees_EASRegistration API, as defined in 3GPP TS 23.558 [2], allows an Edge Application Server via Eees interface to register, update its registration and deregister at a given Edge Enabler Server.

5.2.2 Service Operations

5.2.2.1 Introduction

The service operation defined for Eees_EASRegistration API is shown in the table 5.2.2.1-1.

Table 5.2.2.1-1: Operations of the Eees_EASRegistration API

Service operation name	Description	Initiated by
Eees_EASRegistration_Request	This service operation is used by the EAS to register itself to a given EES.	EAS
Eees_EASRegistration_Update	This service operation is used by the EAS to update its registration information at EES.	EAS
Eees_EASRegistration_Deregister	This service operation is used by the EAS to deregister itself from a given EES.	EAS

5.2.2.2 Eees_EASRegistration_Request

5.2.2.2.1 General

This service operation is used by EAS to register itself to a given EES.

5.2.2.2.2 EAS registering to EES using Eees_EASRegistration_Request operation

To register itself as an Edge Application Server at the EES, the EAS shall send an HTTP POST message to the Edge Enabler Server on the "EAS Registrations" collection resource. The body of the HTTP POST message shall include the EAS profile information, may include proposed expiration time for the registration, as specified in clause 8.1.2.2.3.1.

Upon receiving the HTTP POST message from the EAS, the EES shall:

1. Process the EAS registration request information;
2. verify the identity of the Edge Application Server and check if the EAS is authorized to register itself at EES ;
3. if the EAS is authorized to register to EES, then the EES shall;
 - a. store the EAS profile and create a new resource with the EAS registration information as specified in clause 8.1.2.1;
 - b. return the EAS registration information, the resource URI of the EAS registration information, in the "201 Created" response message. The EES shall include a Location HTTP header field. The Location header field shall contain the URI of the created registration i.e. {apiRoot}/ees-easregistration/<apiVersion>/registrations/{registrationId}.

The response message may include expiration time to indicate when the EAS registration will automatically expire.

On failure, the EES shall take proper error handling actions, as specified in clause 8.1.6, and respond to the EAS with an appropriate error status code.

If the expiration time is provided, then to maintain the registration, the EAS shall send a registration update request (as described in clause 5.2.2.3) prior to the expiration time. If the registration update request is not sent before the expiry time, then the EES shall treat the EAS as deregistered and remove the corresponding EAS registration resource.

5.2.2.3 Eees_EASRegistration_Update

5.2.2.3.1 General

This service operation is used by EAS to update its registration information at a given EES.

5.2.2.3.2 EAS updating registration information using Eees_EASRegistration_Update operation

To update the EAS registration information at the EES, the EAS shall send a HTTP PUT or PATCH message to the Edge Enabler Server on resource URI identifying the Individual EAS registration resource representation, as specified in clause 8.1.2.3.3.2 for HTTP PUT message and in clause 8.1.2.3.3.4 for HTTP PATCH message.

The HTTP PUT message shall replace all properties in the existing resource with the EAS registration information in the request. The EASRegistration data type in the request body of the HTTP PUT message shall include the EAS profile information, may include proposed expiration time to update the registration. This request shall not replace the easId property of the existing resource.

The HTTP PATCH message includes parameters (EAS Profile, expiry time) in the EASRegistrationPatch data type that need to modify the existing Individual EAS registration resource. This request shall not replace the easId property of the existing resource.

Upon receiving the HTTP PUT or PATCH message from the EAS, the EES shall:

1. check the registration update message from the EAS to see if the EAS is authorized to modify the requested registration resource;
2. if the EAS is authorized to update the registration information, then the EES shall:
 - a. update the resource identified by Resource URI of the EAS registration information with the updated EAS registration information received in the HTTP PUT or PATCH request message;
 - b. upon successful update of EAS registration information, respond to the EAS with "204 No Content", or "200 OK" along with the updated EAS registration information in the response. In the response message, the EES may provide an updated expiration time to indicate to the EAS when the updated registration will automatically expire.

On failure, the EES shall take proper error handling actions, as specified in clause 8.1.6, and respond to the EAS with an appropriate error status code.

If the EES determines that the received HTTP PUT or PATCH request needs to be redirected, the EES 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 EES where the message should be sent. Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [6].

If the expiration time is provided, then to maintain the registration, the EAS shall send a registration update prior to registration expiry time. If the registration update request is not sent before the expiry time, then the EES shall treat EAS as deregistered and remove the corresponding EAS registration resource.

5.2.2.4 Eees_EASRegistration_Deregister

5.2.2.4.1 General

This service operation is used by EAS to deregister itself from a given EES.

5.2.2.4.2 EAS deregistering from EES using Eees_EASRegistration_Deregister operation

To deregister itself from the EES, the EAS shall send HTTP DELETE message to the EES, on the resource URI identifying the Individual EAS registration resource representation as specified in clause 8.1.2.3.3.3. Upon receiving the HTTP DELETE request, the EES shall:

1. verify the identity of the EAS and check if the EAS is authorized to deregister the EAS registration information;
2. if the EAS is authorized to deregister the EAS registration information, then the EES shall deregister the EAS profile from the EES and delete the resource representing EAS registration information;
3. return the "204 Not Content" message to the EAS, indicating the successful deregistration of the EAS information.

On failure, the EES shall take proper error handling actions, as specified in clause 8.1.6, and respond to the EAS with an appropriate error status code.

If the EES determines that the received HTTP DELETE request needs to be redirected, the EES 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 EES where the message should be sent. Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [6].

5.3 Eees_UELocation Service

5.3.1 Service Description

The Eees_UELocation API, as defined in 3GPP TS 23.558 [2], allows an Edge Application Server via Eees interface to obtain the UE location information as one time request or subscribe for continuous reporting.

5.3.2 Service Operations

5.3.2.1 Introduction

The service operation defined for Eees_UELocation API is shown in the table 5.3.2.1-1.

Table 5.3.2.1-1: Operations of the Eees_UELocation API

Service operation name	Description	Initiated by
Eees_UELocation_Get	This service operation is used by the EAS to request UE location information from a given EES.	EAS
Eees_UELocation_Subscribe	This service operation is used by the EAS to subscribe to EES, for continuous reporting of UE location information.	EAS
Eees_UELocation_Notify	This service operation is used by the EES to notify the EAS about the UE location information.	EES
Eees_UELocation_UpdateSubscription	This service operation is used by the EAS to update its subscription at EES, for continuous reporting of UE location information.	EAS
Eees_UELocation_Unsubscribe	This service operation is used by the EAS to remove its subscription from EES, for continuous reporting of UE location information.	EAS

5.3.2.2 Eees_UELocation_Get

5.3.2.2.1 General

This service operation is used by EAS to obtain a UE's location information from a given EES.

5.3.2.2.2 EAS obtaining UE location information from EES using Eees_UELocation_Get operation

To obtain an UE's location information from the EES, the EAS shall send an HTTP POST message to the EES on the URI "{apiRoot}/ees-uelocation/<apiVersion>/fetch" as specified in clause 8.2.3.2. The POST request includes:

- the identifier of the UE for which location information is requested;
- the accuracy of the requested location in terms of granularity and location QoS.

Upon reception of the HTTP POST request from the EAS, the EES shall:

1. process the EAS UE location information request;

2. verify the identity of the Edge Application Server and check if the EAS is authorized to obtain UE location information;
3. if the EAS is authorized to obtain the UE's location information, then the EES shall:
 - a. consider the location granularity information received in the request message to obtain the UE's location information;
 - b. check if a valid locally cached UE location information is available, and if available then the EES shall return the UE location information in the format requested by the EAS along with the location accuracy and its timestamp;
 - c. if valid UE location information is not available in local cache, then the EES shall obtain the UE location information by consuming the 3GPP core network capabilities. The EES shall return the UE location information to EAS in the format requested by the EAS along with the location accuracy and its timestamp as a 200 OK response.

On failure, the EES shall take proper error handling actions, as specified in clause 8.2.6, and respond to the EAS with an appropriate error status code.

If the EES determines that the received HTTP POST request needs to be redirected, the EES 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 EES where the message should be sent. Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [6].

5.3.2.2.3 User consent management

Based on local regulations' requirements and/or operator policies, user consent management specified in Annex V of 3GPP TS 33.501 [6] may be required for accessing the Eees_UELocation API. When it is the case and the EES is accessing the 3GPP 5GC network services directly, the EES shall act as the consent enforcement entity, as specified in clause 5.1.3 of 3GPP TS 33.558 [20].

When user consent management and enforcement shall be undertaken for the Eees_UELocation API, then:

- the EES shall check user consent for the targeted UE by retrieving the user consent subscription data via the Nudm_SDM service API of the UDM, as specified in clause 5.2.2.2.24 of 3GPP TS 29.503 [22] and:
 - if user consent is not granted for the targeted UE, the EES shall reject the request and respond to the EAS with an HTTP "403 Forbidden" status code with the response body containing a ProblemDetails data structure with the "cause" attribute including the "USER_CONSENT_NOT_GRANTED" application error; and
 - if user consent is granted for the targeted UE, the EES shall accept the request to retrieve UE location information and process it as specified in clause 5.3.2.2.2.

5.3.2.3 Eees_UELocation_Subscribe

5.3.2.3.1 General

This service operation is used by the EAS to subscribe for continuous UE(s) location reporting.

5.3.2.3.2 EAS subscribing to continuous UE(s) location reporting from EES using Eees_UELocation_Subscribe operation

To subscribe to continuous UE(s) location information reporting at the EES, the EAS shall send a HTTP POST message to the EES on the "Location Information Subscriptions" resource. The body of the POST message shall include EAS identifier, the identifier of the UE or the identifier of the group uniquely identifying a group of UEs, Notification Destination URI and may include location format that is understood by EAS, location QoS, proposed expiry time of the subscription and reporting requirements, as specified in clause 8.2.2.2.3.1.

Upon receiving the HTTP POST message from the EAS, the EES shall:

1. Process the EAS UE location information subscription request;

2. verify the identity of the Edge Application Server and check if the EAS is authorized to subscribe for the continuous UE(s) location reporting;
3. if the EAS is authorized to subscribe for the continuous UE(s) location information reporting, then the EES shall:
 - a. create a new resource with the Location Information Subscription as specified in clause 8.2.2.1;
 - b. return the EAS's location subscription information, the resource URI of the EAS location subscription, in the response message. The response message may include expiration time to indicate when the location information subscription will automatically expire;

On failure, the EES shall take proper error handling actions, as specified in clause 8.2.6, and respond to the EAS with an appropriate error status code.

EES shall obtain the UE location information by consuming the 3GPP core network capabilities from NEF as specified in 3GPP TS 29.522 [10], or from SCEF as specified in 3GPP TS 29.122 [6] or from LCS (Location Service) as specified in 3GPP TS 23.271 [23] or 3GPP TS 23.273 [24]. The EES may also consume the UE mobility analytics from NEF as specified in 3GPP TS 29.522 [10] or from NWDAF as specified in 3GPP TS 29.520 [12].

If the expiration time is provided, then to maintain the registration, the EAS shall send a subscription update request (as described in clause 5.3.2.5) prior to the expiration time. If the subscription update request is not sent before the expiry time, then the EES shall treat the subscription as unsubscribed and remove the corresponding EAS's Individual Location Information Subscription resource.

5.3.2.3.3 User consent management

Based on local regulations' requirements and/or operator policies, user consent management specified in Annex V of 3GPP TS 33.501 [6] may be required for accessing the Eees_UELocation API. When it is the case and the EES is accessing the 3GPP 5GC network services directly, the EES shall act as the consent enforcement entity, as specified in clause 5.1.3 of 3GPP TS 33.558 [20].

When user consent management and enforcement shall be undertaken for the Eees_UELocation API, then:

- if the EAS does not support the "UserConsentRevocation" feature or does not indicate its support for this feature in the HTTP POST request to create a new "Individual Location Information Subscription" resource, the EES shall reject the request and respond to the EAS with an HTTP "403 Forbidden" status code with the response body containing a ProblemDetails data structure with the "cause" attribute including the "CONSENT_REVOCATION_NOT_SUPPORTED" application error;
- if the EAS indicates its support for the "UserConsentRevocation" feature in the HTTP POST request to create a new "Individual Location Information Subscription" resource, the EES shall check user consent for the targeted UE(s) by retrieving the user consent subscription data via the Nudm_SDM service API of the UDM as specified in clause 5.2.2.2.24 of 3GPP TS 29.503 [22], subscribe to user consent revocation notifications only for those UE(s) for which user consent is granted also using the Nudm_SDM service API of the UDM and accept the request for the creation of the UE location information subscription only for the UE(s) for which user consent is granted;
- if user consent is not granted for all the targeted UE(s), the EES shall reject the request and respond to the EAS with an HTTP "403 Forbidden" status code with the response body containing a ProblemDetails data structure with the "cause" attribute including the "USER_CONSENT_NOT_GRANTED" application error;
- the EAS shall provide within the payload body of the HTTP POST request to create a new UE location information subscription the URI via which it desires to receive user consent revocation notifications within the "revocationNotifUri" attribute. The EAS may update this URI in subsequent HTTP PUT/PATCH requests to update/modify the corresponding "Individual Location Information Subscription" resource;
- when becoming aware of user consent revocation for one or several UE(s), the EES shall:
 - stop processing the data related to the concerned UE(s);
 - send a user consent revocation notification to the EAS by sending an HTTP POST request with the request body including the ConsentRevocNotif data structure that shall contain the user consent revocation information (e.g. UE(s) for which user consent was revoked, etc.); and

- remove the concerned UE(s) from the "Individual Location Information Subscription" resource and from the related subscriptions at the 3GPP 5GC network entities, if any;
 - unsubscribe from user consent revocation notifications for the concerned UE(s) at the UDM;
- and
- at the reception of the user consent revocation notification from the EES, the EAS shall take the necessary actions to stop processing the data related to the concerned UE(s); and
 - if user consent is revoked for all the UE(s), the EAS shall delete the corresponding "Individual Location Information Subscription" resource, as specified in clause 5.3.2.6.

5.3.2.4 Eees_UELocation_Notify

5.3.2.4.1 General

This service operation is used by the EES to send UE(s) location information notifications or user consent revocation notifications to the EAS.

5.3.2.4.2 EES notifying the UE(s) location reporting to EAS using Eees_UELocation_Notify operation

The EES determines to notify the EAS with the UE location information, when the UE location information is available either locally cached or from the 3GPP core network.

To notify the UE(s) location information events, the EES shall send an HTTP POST message using the Notification Destination URI received in the subscription request. The body of the HTTP POST message shall include LocationNotification. LocationNotification includes location information of each UE with accuracy, and timestamp. The location information of each UE may be actual location change or predictive location report from the UE mobility analytics report from NEF as specified in 3GPP TS 29.522 [10], or from SCEF as specified in 3GPP TS 29.122 [6], or from LCS (Location Service) as specified in 3GPP TS 29.271 [23] or 3GPP TS 29.273 [24] or from NWDAF as specified in 3GPP TS 29.520 [12]. The EES may modify the UE location information in the format requested by the EAS in the subscription request.

Upon receiving the HTTP POST message, the EAS shall process the Location Notification.

On failure, the EAS shall take proper error handling actions, as specified in clause 8.2.6, and respond to the EES with an appropriate error status code.

If the EAS determines that the received HTTP POST message needs to be redirected, the EAS 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 EAS where the notification should be redirected. Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [6].

5.3.2.4.3 EES notifying the EAS about user consent revocation using Eees_UELocation_Notify operation

The EES determines to notify the EAS about user consent revocation, when becoming aware of user consent revocation for one or several UE(s) from the UDM as specified in 3GPP TS 29.503 [22].

To notify user consent revocation, the EES shall send an HTTP POST message using the revocation notification URI received from the EAS in the UE location information subscription creation/update/modification request as specified in clause 5.3.2.3.3. The body of the HTTP POST message shall include ConsentRevocNotif data structure.

Upon reception of the HTTP POST request, the EAS shall take the necessary actions to stop processing the data related to the UE(s) for which user consent was revoked.

On failure, the EAS shall take proper error handling actions, as specified in clause 8.2.6, and respond to the EES with an appropriate error status code.

If the EAS determines that the received HTTP POST message needs to be redirected, the EAS 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 EAS where the notification should be redirected. Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [6].

5.3.2.5 Eees_UELocation_UpdateSubscription

5.3.2.5.1 General

This service operation is used by the EAS to update its location information subscription at the EES.

5.3.2.5.2 EAS updating continuous UE(s) location reporting subscription at EES using Eees_UELocation_UpdateSubscribe operation

To update continuous UE(s) location information reporting subscription at the EES, the EAS shall send a HTTP PATCH or PUT message to the EES on resource URI identifying the "Individual Location Information" Subscription resource representation, as specified in clause 8.2.2.3.3.2 for HTTP PATCH message and in clause 8.2.2.3.3.3 for HTTP PUT message.

The PATCH message includes the parameters (location QoS, location granularity, Notification Destination, Reporting requirements and proposed expiry time) that need to be replaced in the existing subscription resource.

The PUT message shall replace all the properties of the existing resource with the location subscription information in the request. The request shall not replace the easId, ueId and groupId properties of the existing resource.

Upon receiving the HTTP PATCH or PUT message from the EAS, the EES shall:

1. check the update subscription message from the EAS to see if the EAS is authorized to modify the requested subscription resource;
2. if the EAS is authorized to update the location information subscription, then the EES shall:
 - a. update the resource identified by Resource URI of the EAS location information subscription with the updated information received in the HTTP PATCH or PUT request message;
 - b. return the updated EAS Location information subscription in the response. In the response message, the EES may provide an updated expiration time to indicate to the EAS when the updated subscription will automatically expire.

On failure, the EES shall take proper error handling actions, as specified in clause 8.2.6, and respond to the EAS with an appropriate error status code.

If the EES determines that the received HTTP PATCH or PUT request needs to be redirected, the EES 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 EES where the message should be sent. Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [6].

If the expiration time is provided, then to maintain the subscription, the EAS shall send a update subscription prior to subscription expiry time. If the update subscription request is not sent before the expiry time, then the EES shall treat EAS subscription as unsubscribed and remove the corresponding EAS location information subscription resource.

5.3.2.5.3 User consent management

Based on local regulations' requirements and/or operator policies, user consent management specified in Annex V of 3GPP TS 33.501 [6] may be required for accessing the Eees_UELocation API. When it is the case and the EES is accessing the 3GPP 5GC network services directly, the EES shall act as the consent enforcement entity, as specified in clause 5.1.3 of 3GPP TS 33.558 [20].

When user consent management and enforcement shall be undertaken for the Eees_UELocation API, then:

- the EAS may update/modify the revocation notification URI when updating/modifying an existing "Individual Location Information Subscription" resource;
- if user consent is still granted for the concerned UE(s), i.e. no user consent revocation notification is received by the EES from the UDM, then the EES shall process the request as specified in clause 5.3.2.5.2;

- if user consent is granted for only a subset of the UE(s), process the request as specified in clause 5.3.2.5.2 only for this subset of UE(s);
- otherwise, if the EES is made aware by the UDM that user consent is not granted for one or several UE(s) at the reception of the Eees_UELocation_UpdateSubscribe request, then the EES shall:
 - stop processing the data related to the concerned UE(s);
 - if user consent is not anymore granted for all the UE(s), reject the request and respond to the EAS with an HTTP "403 Forbidden" status code with the response body containing a ProblemDetails data structure with the "cause" attribute including the "USER_CONSENT_NOT_GRANTED" application error;
 - send a user consent revocation notification to the EAS by sending an HTTP POST request with the request body including the ConsentRevocNotif data structure that shall contain the user consent revocation information (e.g. UE(s) for which user consent was revoked, etc.); and
 - remove the concerned UE(s) from the concerned "Individual Location Information Subscription" resource and from the related subscriptions at the 3GPP 5GC network entities, if any; and
 - unsubscribe from user consent revocation notifications for the concerned UE(s) at the UDM;

and the EAS shall:

- at the reception of the user consent revocation notification from the EES, take the necessary actions to stop processing the data related to the concerned UE(s); and
- if user consent is revoked for all the UE(s), delete the corresponding "Individual Location Information Subscription" resource, as specified in clause 5.3.2.6.

5.3.2.6 Eees_UELocation_Unsubscribe

5.3.2.6.1 General

This service operation is used by the EAS to unsubscribe from an existing UE(s) location information subscription.

5.3.2.6.2 EAS unsubscribing to continuous UE(s) location reporting from EES using Eees_UELocation_Unsubscribe operation

To unsubscribe its location information subscription from the EES, the EAS shall send HTTP DELETE message to the EES, on the resource URI identifying the "Individual Location Information Subscription" resource representation as specified in clause 8.2.2.3.3.4. Upon receiving the HTTP DELETE request, the EES shall:

1. verify the identity of the EAS and check if the EAS is authorized to unsubscribe the Individual Location Information Subscription resource;
2. if the EAS is authorized to unsubscribe the Individual Location Information Subscription resource, then the EES shall unsubscribe the EAS subscription identified by the subscriptionId from the EES and delete the resource representing Individual Location Information Subscription resource represented by subscriptionId;
3. return the "204 Not Content" message to the EAS, indicating the successful removal of the subscription information and may unsubscribe to the corresponding 3GPP core network service subscriptions.

On failure, the EES shall take proper error handling actions, as specified in clause 8.2.6, and respond to the EAS with an appropriate error status code.

If the EES determines that the received HTTP DELETE message needs to be redirected, the EES 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 EES where the message should be sent. Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [6].

5.4 Eees_UeIdentifier Service

5.4.1 Service Description

The Eees_UeIdentifier API, as defined in 3GPP TS 23.558 [2], allows an Edge Application Server via Eees interface to obtain an identifier uniquely identifying a UE from the EES.

5.4.2 Service Operations

5.4.2.1 Introduction

The service operation defined for Eees_UeIdentifier API is shown in the table 5.4.2.1-1.

Table 5.4.2.1-1: Operations of the Eees_UeIdentifier API

Service operation name	Description	Initiated by
Eees_UeIdentifier_Get	This service operation is used by the EAS to request UE identifier information from a given EES that uses 3GPP CN capability to retrieve UE Identifier which is specific to the EAS.	EAS

The Eees_UeIdentifier_Get service operation as defined in 3GPP TS 23.558 [2] is used by a service consumer to retrieve UE Identifier Information.

The following procedures using the Eees_UeIdentifier_Get service operation service operation are supported:

- EAS obtaining UE Identifier Information using the Get custom operation.

5.4.2.2 Eees_UeIdentifier_Get

5.4.2.2.1 General

This service operation is used by EAS to obtain a UE's identifier (UE ID, as specified in 3GPP TS 23.558 [2]) from a given EES that uses 3GPP CN capability to retrieve UE Identifier which is specific to the EAS.

5.4.2.2.1A EAS obtaining UE Identifier Information using "Get" custom operation

In order to obtain an UE Identifier from the EES, the EAS shall send a HTTP POST request message to the EES with the request custom operation URI set to "{apiRoot}/eees-ueidentifier/<apiVersion>/get" and the request body including the UserInfo data structure as defined in clause 8.3.5.2.3.

Upon receiving the HTTP POST message from the EAS, the EES shall:

1. verify the identity of the EAS and check if the EAS is authorized to obtain the UE Identifier; and
2. if the EAS is authorized to obtain the UE's Identifier information, the EES shall:
 - a. invoke the Nnef_UEId service as specified in clause 4.4.32 of 3GPP TS 29.522 [10] to obtain the UE identifier based on the user information received, and may derive the corresponding DNN and/or S-NSSAI based on the verified identity of the EAS; and
 - b. upon successful retrieval of the UE identifier, respond with "200 OK" along with the retrieved UE identifier information in the UeIdInfo data type to the EAS.

If the EES determines the received HTTP POST request needs to be redirected, the EES 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 EES where the request message should be sent. Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [6].

On failure or if the EES receives an error code from the NEF, the EES shall take proper error handling actions, as specified in clause 8.3.6.

5.4.2.2.2 EAS obtaining UE identifier from EES using Eees_UEIdentifier_Fetch custom operation

This procedure and the corresponding custom operation are deprecated. The procedure in clause 5.4.2.2.1A should be used instead.

To obtain an UE's Identifier from the EES, the EAS shall send a HTTP POST message to the EES with the request URI set to "{apiRoot}/ees-ueidentifier/<apiVersion>/fetch" and the request body with the UserInformation data structure including the information about the user or UE available with EAS, for which the UE identifier is requested.

Upon receiving the HTTP POST message from the EAS, the EES shall:

1. Process the EAS UE Identifier request;
2. verify the identity of the EAS and check if the EAS is authorized to obtain the UE Identifier;
3. if the EAS is authorized to obtain the UE's Identifier information, then the EES shall;
 - a. invoke the Nnef_UEId service as specified in clause 4.4.32 of 3GPP TS 29.522 [10] to obtain the UE identifier based on the user information received, and may derive the corresponding DNN and/or S-NSSAI based on the verified identity of the EAS;
 - b. upon successful retrieval of UE identifier, respond with "200 OK" along with the retrieved UE identifier to the EAS. If the UE identifier cannot be successfully retrieved or an internal error or an error in the HTTP POST request, the EES shall send an HTTP error response as specified in clause 7.7.

If the EES determines the received HTTP POST request needs to be redirected, the EES 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 EES where the request message should be sent. Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [6].

5.5 Eees_AppClientInformation Service

5.5.1 Service Description

The Eees_AppClientInformation API, as defined in 3GPP TS 23.558 [2], allows an Edge Application Server via Eees interface to obtain the information about the capabilities of the ACs based on certain filter criteria.

5.5.2 Service Operations

5.5.2.1 Introduction

The service operation defined for Eees_AppClientInformation API is shown in the table 5.5.2.1-1.

Table 5.5.2.1-1: Operations of the Eees_AppClientInformation API

Service operation name	Description	Initiated by
Eees_AppClientInformation_Subscribe	This service operation is used by the EAS to subscribe to EES, for reporting of AC information.	EAS
Eees_AppClientInformation_Notify	This service operation is used by the EES to notify the EAS about the AC information.	EES
Eees_AppClientInformation_UpdateSubscription	This service operation is used by the EAS to update its subscription at EES, for reporting of AC information.	EAS
Eees_AppClientInformation_Unsubscribe	This service operation is used by the EAS to remove its subscription from EES, for reporting of AC information.	EAS

5.5.2.2 Eees_AppClientInformation_Subscribe

5.5.2.2.1 General

This service operation is used by the EAS to subscribe for AC(s) information reporting.

5.5.2.2.2 EAS subscribing to AC information reporting from EES using Eees_AppClientInformation_Subscribe operation

To subscribe to AC information reporting at the EES, the EAS shall send an HTTP POST request to the EES targeting the "Application Client Information Subscriptions" resource, with the request body containing the ACInfoSubscription data structure, as specified in clause 8.4.2.2.3.1.

Upon receiving the HTTP POST request from the EAS, the EES shall:

1. Process the EAS AC information subscription request;
2. verify the identity of the Edge Application Server and check if the EAS is authorized to subscribe for the AC information reporting;
3. if the EAS is authorized to subscribe for the AC information reporting, then the EES shall:
 - a. create a new resource with the AC Information Subscription as specified in clause 8.4.2.1; and
 - b. respond to the EAS with an HTTP "201 Created" status code including an HTTP Location header field containing the URI of the created "Individual Application Client Information Subscription" resource, and the response body containing a representation of the created resource within the ACInfoSubscription data structure.

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. If the EAS is not registered at the EES when sending the AC information reporting subscription creation request, the EES shall respond with an HTTP "403 Forbidden" status code with the response body containing the ProblemDetails data structure with the "cause" attribute set to "REGISTRATION_REQUIRED".

The EES determines the matching AC information corresponding to the filter criteria information in the subscription request to compose the AC information to the EAS.

If the expiration time is provided, then to maintain the registration, the EAS shall send a subscription update request (as described in clause 5.5.2.4) prior to the expiration time. If the subscription update request is not sent before the expiry time, then the EES shall treat the subscription as unsubscribed and remove the corresponding EAS's Individual Application Client Information Subscription resource.

5.5.2.3 Eees_AppClientInformation_Notify

5.5.2.3.1 General

This service operation is used by the EES to send AC information notifications to the EAS.

5.5.2.3.2 EES notifying the AC information to EAS using Eees_AppClientInformation_Notify operation

The EES determines to notify the EAS with the AC information matching the filter criteria, when the AC information updates are available to EES, e.g. EES receives registration request from EEC.

To notify the AC(s) information, the EES shall send an HTTP POST message using the Notification Destination URI received in the subscription request. The body of the HTTP POST message shall include "ACInfoNotification". "ACInfoNotification" includes AC(s) information matching the filter criteria. The AC(s) information consist of AC(s) profiles, UE identifiers hosting the AC(s) and the location information of the UE(s) hosting the AC(s).

Upon receiving the HTTP POST message, the EAS shall process the AC Information Notification and shall respond to the EES with "204 No Content" message.

On failure, the EAS shall take proper error handling actions, as specified in clause 8.4.6, and respond to the EES with an appropriate error status code.

If the EAS determines that the received HTTP POST message needs to be redirected, the EAS 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 EAS where the notification should be redirected. Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [6].

5.5.2.4 Eees_AppClientInformation_UpdateSubscription

5.5.2.4.1 General

This service operation is used by the EAS to update its AC information subscription at the EES.

5.5.2.4.2 EAS updating AC information reporting subscription at EES using Eees_AppClientInformation_UpdateSubscribe operation

To update AC information reporting subscription at the EES, the EAS shall send a HTTP PATCH or PUT message to the EES on resource URI identifying the "Individual Application Client Information" Subscription resource representation, as specified in clause 8.4.2.3.3.2 for HTTP PATCH message and in clause 8.4.2.3.3.3 for HTTP PUT message.

The PATCH message includes the parameters (AC filter criteria, Notification Destination, Reporting requirements and proposed expiry time) that need to be replaced in the existing subscription resource.

The PUT message shall replace all the properties of the existing resource with the AC subscription information in the request. The request shall not replace the "easId" property of the existing resource.

Upon receiving the HTTP PATCH or PUT message from the EAS, the EES shall:

1. check the update subscription message from the EAS to see if the EAS is authorized to modify the requested subscription resource;
2. if the EAS is authorized to update the AC information subscription, then the EES shall:
 - a. update the resource identified by Resource URI of the EAS AC information subscription with the updated information received in the HTTP PATCH or PUT request message;
 - b. return the updated EAS AC information subscription in the "200 OK" response message or respond with the "204 No Content" message indicating to the EAS that the EAS AC information subscription is updated successfully. In the response message, the EES may provide an updated expiration time to indicate to the EAS when the updated subscription will automatically expire.

On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the HTTP PATCH or PUT response body. If the EAS is not registered at the EES when sending the AC information reporting subscription update request, the EES shall respond with an HTTP "403 Forbidden" status code with the response body containing the ProblemDetails data structure with the "cause" attribute set to "REGISTRATION_REQUIRED".

If the EES determines that the received HTTP PATCH or PUT message needs to be redirected, the EES 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 EES where the message should be sent. Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [6].

If the expiration time is provided, then to maintain the subscription, the EAS shall send an update subscription prior to subscription expiry time. If the update subscription request is not sent before the expiry time, then the EES shall treat EAS subscription as unsubscribed and remove the corresponding EAS AC information subscription resource.

5.5.2.5 Eees_AppClientInformation_Unsubscribe

5.5.2.5.1 General

This service operation is used by the EAS to unsubscribe from an existing AC information subscription.

5.5.2.5.2 EAS unsubscribing to AC information reporting from EES using Eees_AppClientInformation_Unsubscribe operation

To unsubscribe its AC information subscription from the EES, the EAS shall send HTTP DELETE message to the EES, on the resource URI identifying the "Individual Application Client Information Subscription" resource representation as specified in clause 8.4.2.3.3.4. Upon receiving the HTTP DELETE request, the EES shall:

1. verify the identity of the EAS and check if the EAS is authorized to unsubscribe the Individual Application Client Information Subscription resource;
2. if the EAS is authorized to unsubscribe the Individual Application Client Information Subscription resource, then the EES shall unsubscribe the EAS subscription identified by the "subscriptionId" from the EES and delete the resource representing Individual Application Client Information Subscription resource represented by "subscriptionId";
3. return the "204 Not Content" message to the EAS, indicating the successful removal of the subscription information.

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. If the EAS is not registered at the EES when sending the AC information reporting subscription deletion request, the EES shall respond with an HTTP "403 Forbidden" status code with the response body containing the ProblemDetails data structure with the "cause" attribute set to "REGISTRATION_REQUIRED".

If the EES determines that the received HTTP DELETE request needs to be redirected, the EES 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 EES where the message should be sent. Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [6].

5.6 Eees_SessionWithQoS Service

5.6.1 Service Description

The Eees_SessionWithQoS API, as defined in 3GPP TS 23.558 [2], allows an Edge Application Server via Eees interface to support the setup of a data session between AC and EAS with a specific QoS and the modification of the QoS of this data session.

5.6.2 Service Operations

5.6.2.1 Introduction

The service operation defined for Eees_SessionWithQoS API is shown in the table 5.6.2.1-1.

Table 5.6.2.1-1: Operations of the Eees_SessionWithQoS API

Service operation name	Description	Initiated by
Eees_SessionWithQoS_Create	The service operation is used by the EAS to request reservation of resources for a data session between AC and EAS with a specific QoS and to subscribe to certain session with user plane event notifications.	EAS
Eees_SessionWithQoS_Update	The service operation is used by the EAS to request a modification of the QoS of the data session between AC and EAS.	EAS
Eees_SessionWithQoS_Revoke	The service operation is used by the EAS to revoke the data session between AC and EAS with a specific QoS and to unsubscribe to the related session with user plane event notifications.	EAS
Eees_SessionWithQoS_Notify	The service operation is used by the EES to notify the EAS about a user plane event associated with the established session between an AC and the EAS.	EES

5.6.2.2 Eees_SessionWithQoS_Create

5.6.2.2.1 General

This service operation is used by EAS to request reservation of resources for a data session between AC and EAS with a specific QoS and to subscribe to certain session with user plane event notifications.

5.6.2.2.2 EAS requesting reservation of resources for a data session between AC and EAS with specific QoS using Eees_SessionWithQoS operation

To request establishment of a data session between AC and EAS with a specific QoS, the EAS shall send a HTTP POST message to the Edge Enabler Server on the "Sessions with QoS" resource as specified in clause 8.5.2.2.3.1. The body of POST message shall include the EAS identifier, only one of the UE's IP address or the Identifier of the UE or the identifier of the group uniquely identifying a group of UEs, IP flow description, and at least one of requested QoS reference. The body of POST message may include a list of associated events which the EAS subscribes, and if the event list is included, a Notification Destination URI shall also be provided.

Upon receiving the HTTP POST message from the EAS:

1. the EES shall process the EAS Session with QoS Create request;
2. the EES shall verify the identity of the EAS and check if the EAS is authorized to request reservation of resources for a data session between AC and EAS with a specific QoS;
3. if the EAS is authorized, then the EES shall:
 - a. create a new resource "Individual Session with QoS";
 - b. if the request is for a group of UEs identified by group ID (i.e., via the "intGrpId" or "extGrpId") or for a single UE identified via the "ueId" attribute, interact with the SCEF (as specified in 3GPP TS 29.122 [6]) or the NEF (as specified in 3GPP TS 29.522 [10]) by invoking the MonitoringEvent API with the monitoring type sets to "PDN_CONNECTIVITY_STATUS" to request to be notified when the 3GPP network detects the UE's PDN connection or PDU session is set up or torn down. If the IP address for the single UE or, the IP address(es) for one or more UEs within the group are received from the 3GPP network, then execute step 3c; and
 - c. if the request is for a single UE identified by the IP address or the IP address is obtained in step 3b, interact directly with the PCRF (as specified in 3GPP TS 29.214 [15]) or the PCF (as specified in 3GPP TS 29.514 [16]), or via the SCEF (as specified in 3GPP TS 29.122 [6]) or the NEF (as specified in 3GPP TS 29.522 [10]) by invoking the AsSessionWithQoS API, to provide the specific QoS information to the PCF;
4. if the EAS is authorized, then if one of the subscribed event(s) is "UP_PATH_CHG", "ACR_MONITORING" and/or "ACR_FACILITATION" event:

- a) if the "EdgeApp_2" feature is supported, the EAS may provide the traffic filter information in the "trafFilterInfo" attribute in the request body and:
 - i) the EES may invoke the Nnef_PfdManagement API as described in clause 4.4.6 of 3GPP TS 29.522 [10] and clause 4.4.10 of 3GPP TS 29.122 [18] with the same Application Identifier that is used for requesting user plane path management events monitoring as defined further below;
 - ii) if the Application Identifier is not provided by the EAS, the EES may map the EAS ID into the Application Identifier that is used to invoke the Nnef_PfdManagement API;
 - iii) if the invocation of the PFD Management procedures towards the 3GPP network fails (e.g. the PFD Management service is not supported by the 3GPP Core Network), the EES shall reject the request in step 6 with an appropriate error response; and
 - iv) if the PFD Management service is not supported by the 3GPP Core Network, the EES shall reject the request with an HTTP "403 Forbidden" status code with the response body containing the ProblemDetails data structure including the "cause" attribute set to the "PFD_MNGT_NOT_SUPPORTED" application error;

and

5. upon receipt of successful response from 3GPP network, respond to the EAS with "201 Created" and include the session with QoS context information. The new created resource URI shall also be included in the Location header field of the HTTP response message.in the response message.

On failure, the EES shall take proper error handling actions, as specified in clause 8.5.6, and respond to the EAS with an appropriate error status code.

5.6.2.3 Eees_SessionWithQoS_Update

5.6.2.3.1 General

This service operation is used by EAS to request updating QoS of a data session between AC and EAS and to modify the subscription of the session with user plane event notifications.

5.6.2.3.2 EAS updating QoS of a data session between AC and EAS using Eees_SessionWithQoS_Update operation

To request modification of the QoS of the data session between AC and EAS, the EAS shall send a HTTP PATCH or PUT message to the EES on resource URI "Individual Session with QoS" resource as specified in clause 8.5.2.3.3.1 for HTTP PATCH message and in clause 8.5.2.3.3.2 for HTTP PUT message.

The PUT message shall replace all the QoS settings of the data session in the existing context. The request shall not change the values of the "easId", "ueId", "ueIpv4Addr", "ueIpv6Addr", "ipDomain", "intGrpId", "extGrpId", "dnn" and/or "snsai" attributes.

Upon receiving the HTTP PATCH or PUT message from the EAS:

1. the EES shall check the update of the existing Individual Session with QoS from the EAS is authorized or not;
2. if the EAS is authorized, then if one of the subscribed event(s) is "UP_PATH_CHG", "ACR_MONITORING" and/or "ACR_FACILITATION" event:
 - a) if the "EdgeApp_2" feature is supported, the EAS may provide the traffic filter information in the "trafFilterInfo" attribute in the request body and:
 - i) the EES may invoke the Nnef_PfdManagement API as described in clause 4.4.6 of 3GPP TS 29.522 [10] and clause 4.4.10 of 3GPP TS 29.122 [18] with the same Application Identifier that is used for requesting user plane path management events monitoring as defined further below;
 - ii) if the Application Identifier is not provided by the EAS, the EES may map the EAS ID into the Application Identifier that is used to invoke the Nnef_PfdManagement API;

- iii) if the invocation of the PFD Management procedures towards the 3GPP network fails (e.g., the PFD Management service is not supported by the 3GPP Core Network), the EES shall reject the request in step 6 with an appropriate error response; and
- iv) if the PFD Management service is not supported by the 3GPP Core Network, the EES shall reject the request with an HTTP "403 Forbidden" status code with the response body containing the ProblemDetails data structure including the "cause" attribute set to the "PFD_MNGT_NOT_SUPPORTED" application error;

and

3. if the EAS is authorized, and to update the QoS setting, then the EES shall:
 - a. interact with the 3GPP network to update the associated data session; and
 - b. upon receipt of successful response from 3GPP network, respond to the EAS with "204 No Content", or "200 OK" with the updated Individual session with QoS context in the response message.

On failure, the EES shall take proper error handling actions, as specified in clause 8.5.6, and respond to the EAS with an appropriate error status code.

If the EES determines that the received HTTP PATCH or PUT message needs to be redirected, the EES 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 EES where the message should be sent. Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [6].

5.6.2.4 Eees_SessionWithQoS_Revoke

5.6.2.4.1 General

This service operation is used by EAS to revoke the data session between AC and EAS with a specific QoS and to unsubscribe to the related session with user plane event notifications.

5.6.2.4.2 EAS revoking QoS of a data session between AC and EAS using Eees_SessionWithQoS_Revoke operation

To revoke the data session between AC and EAS with a specific QoS and unsubscribe the user plane event notifications, the EAS shall send a HTTP DELETE message to the EES targeting the Individual Session with QoS resource as specified in clause 8.5.2.3.3.3. Upon receiving the HTTP DELETE request, the EES shall:

1. verify the identity of the EAS and check if the EAS is authorized to revoke the data session between AC and EAS with a specific QoS;
2. if the EAS is authorized and the resource exists, then the EES shall interact with the 3GPP network to delete the associated data session.
3. upon receipt of successful response from 3GPP network, delete the Individual Session with QoS resource corresponding to the individual Session with QoS; and
4. return "204 No Content" message to the EAS, indicating the successful removal.

On failure, the EES shall take proper error handling actions, as specified in clause 8.5.6, and respond to the EAS with an appropriate error status code.

If the EES determines that the received HTTP DELETE message needs to be redirected, the EES 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 EES where the message should be sent. Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [6].

5.6.2.5 Eees_SessionWithQoS_Notify

5.6.2.5.1 General

This service operation is used by EES to send user plane event notification information of the data session between AC and EAS with a specific QoS to the EAS.

5.6.2.5.2 EES notifying QoS of a data session between AC and EAS using Eees_SessionWithQoS_Notify operation

The EES determines to notify the user plane event notification information to the EAS, when the EES receives the notification of the user plane event information from the 3GPP core network.

To notify the user plane event notification information, the EES shall send an HTTP POST message using the Notification Destination URI received during the creation or modification of resource request. The body of POST message shall include the event report information (e.g., resource allocation outcome or information that the QoS targets can no longer (or can again) be fulfilled).

Upon receiving the HTTP POST message, the EAS shall process the event report information and return "204 No Content" message to the EES.

On failure, the EAS shall take proper error handling actions, as specified in clause 8.5.6, and respond to the EES with an appropriate error status code.

If the EAS determines that the received HTTP POST message needs to be redirected, the EAS 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 EAS where the notification should be redirected. Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [6].

5.7 Eees_EASDiscovery Service

5.7.1 Service Description

The Eees_EASDiscovery service API enables a service consumer to:

- request EAS discovery.

5.7.2 Service Operations

5.7.2.1 Introduction

The service operations defined for Eees_EASDiscovery API are shown in the table 5.7.2.1-1.

Table 5.7.2.1-1: Operations of the Eees_EASDiscovery API

Service operation name	Description	Initiated by
Eees_EASDiscovery_TEasDiscRequest	This service operation is used by the service consumer to request EAS discovery information.	EES, EAS, CAS

5.7.2.2 Eees_EASDiscovery_TEasDiscRequest

5.7.2.2.1 General

This service operation is used by the service consumer to request for T-EAS discovery information, as specified for the Eees_TargetEASDiscovery API defined in 3GPP TS 23.558 [2].

5.7.2.2.2 Service consumer requesting T-EAS discovery information using Eees_EASDiscovery_TEasDiscRequest operation

To request for T-EAS discovery, the service consumer shall send an HTTP POST request to the EES as specified in clause 6.3.2.4.4.2 of 3GPP TS 24.558 [14]. The body of the POST message shall include the EasDiscoveryReq data structure as specified in clause 6.3.5.2.2 of 3GPP TS 24.558 [14].

Upon reception of the HTTP POST request from the service consumer, the EES shall:

- a) process the EAS discovery request information;
- b) the EES verifies and checks if the service consumer is authorized to discover the requested EAS(s) from the EES;
- c) if the service consumer is authorized to discover the requested EAS(s) from the EES, then upon successful processing of the request, the EES responds with an HTTP "200 OK" status code with the response body including the EasDiscoveryResp data structure as specified in clause 6.3.5.2.3 of 3GPP TS 24.558 [14] and in clause 8.8.3.2 of 3GPP TS 23.558 [2]. If the successful processing of the request does not result in finding a matching EAS (i.e. there is no client side error), the EES responds with an HTTP "204 No Content" status code.

If the EES determines that the received HTTP POST request needs to be redirected, the EES 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 EES where the notification should be sent. Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [6].

On failure, the EES shall take proper error handling actions, as specified in clause 6.3.6 of 3GPP TS 24.558 [14], and respond to the EAS or EES with an appropriate error status code.

5.8 Eees_ACRManagementEvent Service

5.8.1 Service Description

The Eees_ACRManagementEvent API, as defined in 3GPP TS 23.558 [2], allows a service consumer to support (un)subscription to the notifications of ACR management events.

5.8.2 Service Operations

5.8.2.1 Introduction

The service operation defined for Eees_ACRManagementEvent API is shown in the table 5.8.2.1-1.

Table 5.8.2.1-1: Operations of the Eees_ACRManagementEvent API

Service operation name	Description	Initiated by
Eees_ACRManagementEvent_Subscribe	The service operation is used by the service consumer to subscribe to notifications of ACR management event(s).	EAS, CAS
Eees_ACRManagementEvent_UpdateSubscription	The service operation is used by the service consumer to request a modification of an existing subscription of notifications of ACR management event(s).	EAS, CAS
Eees_ACRManagementEvent_Unsubscribe	The service operation is used by the service consumer to unsubscribe to an existing subscription of notifications of ACR management event(s).	EAS, CAS
Eees_ACRManagementEvent_Notify	The service operation is used by the EES to notify the service consumer about ACR management event(s) if detected.	EES

5.8.2.2 Eees_ACRManagementEvent_Subscribe

5.8.2.2.1 General

This service operation is used by the service consumer to subscribe to notifications of ACR management events (see also clause 8.6.3.2.2 of 3GPP TS 23.558 [2]).

5.8.2.2.2 Service consumer requesting to get notifications of ACR management events using Eees_ACRManagementEvent_Subscribe service operation

In order to subscribe to notifications of ACR management events, the service consumer shall send a HTTP POST request message to the EES targeting the "ACR Management Events Subscriptions" resource as specified in clause 8.6.2.2.3.1. The body of the HTTP POST request message shall include the AcrMgmtEventsSubscription data type as specified in clause 8.6.5.2.2.

Upon reception of the HTTP POST request message from the service consumer:

1. the EES shall verify the identity of the service consumer and check if the service consumer is authorized to subscribe to notifications of ACR management events;
2. if the service consumer is authorized, the EES may interact with the 3GPP Core Network as specified in clause 8.6.3.2.2 of 3GPP TS 23.558 [2];
- 3a. on success, the EES shall create a new "Individual ACR Management Events Subscription" resource and respond to the service consumer with an HTTP "201 Created" status code, with the response body including the representation of the created "Individual ACR Management Events Subscription" resource. The URI of the created resource shall also be included within an HTTP Location header field;

and

3b. on failure:

- ii) the EES shall take proper error handling actions, as specified in clause 8.6.6, and respond to the service consumer with an appropriate error status code; and
- iii) if the "EdgeApp_2" feature is supported and the invocation of the PFD Management procedures towards the 3GPP network as part of step 2 above fails because the PFD Management service is not supported by the 3GPP Core Network, the EES shall reject the request with an HTTP "403 Forbidden" status code with the response body containing the ProblemDetails data structure including the "cause" attribute set to the "PFD_MNGT_NOT_SUPPORTED" application error.

5.8.2.3 Eees_ACRManagementEvent_UpdateSubscription

5.8.2.3.1 General

This service operation is used by the service consumer to request updating an existing Individual ACR Management Events Subscription (see also clause 8.6.3.2.4 of 3GPP TS 23.558 [2]).

5.8.2.3.2 Service consumer updating an existing Individual ACR Management Events Subscription using Eees_ACRManagementEvent_UpdateSubscription service operation

To request the modification or update of an existing "Individual ACR Management Events Subscription" resource, the service consumer shall send an HTTP PATCH request (for partial modification) or PUT request (for update via full replacement) message to the EES targeting the URI of the corresponding "Individual ACR Management Events Subscription" resource, as specified in clause 8.6.2.3.3.1 (for an HTTP PATCH) message and in clause 8.6.2.3.3.2 (for an HTTP PUT message). This request shall not update the "easId" property of the existing resource.

Upon receiving the HTTP PATCH or PUT request message from the EAS:

1. the EES shall check whether the service consumer is authorized to update this existing "Individual ACR Management Events Subscription" resource;

2. if the service consumer is authorized, the EES may interact with the 3GPP Core Network as specified in clause 8.6.3.2.4 of 3GPP TS 23.558 [2]:
 - 3a. upon successful processing of the request and the reception of successful response(s) from the 3GPP Core Network, if needed as per step 3 above, the EES shall update the targeted existing "Individual ACR Management Events Subscription" resource accordingly and respond to the service consumer with either an HTTP "204 No Content" status code, or an HTTP "200 OK" status code with the response body including the updated "Individual ACR Management Events" Subscription resource.
 - 3b. on failure, the EES shall take proper error handling actions, as specified in clause 8.6.6, and respond to the service consumer with an appropriate error status code; and
 - 3c. if the EES determines that the received HTTP PATCH or PUT message needs to be redirected, the EES 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 EES where the message should be redirected. Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [6].

5.8.2.4 Eees_ACRManagementEvent_Unsubscribe

5.8.2.4.1 General

This service operation is used by the service consumer to delete an existing ACR Management Events Subscription (see also clause 8.6.3.2.5 of 3GPP TS 23.558 [2]).

5.8.2.4.2 Service consumer deleting an existing Individual ACR Management Events Subscription using Eees_ACRManagementEvent_Unsubscribe service operation

To delete an existing "Individual ACR Management Events Subscription", the service consumer shall send a HTTP DELETE request message to the EES targeting the concerned "Individual ACR Management Events Subscription" resource as specified in clause 8.6.2.3.3.3. Upon reception of the HTTP DELETE request:

1. the EES shall verify the identity of the service consumer and check if the service consumer is authorized to delete the targeted "Individual ACR Management Events Subscription" resource;
2. if the service consumer is authorized and the resource exists, then the EES may interact with the 3GPP Core Network as specified in clause 8.6.3.2.5 of 3GPP TS 23.558 [2]; and
 - 3a. upon successful processing of the request, the EES shall delete the "Individual ACR Management Events Subscription"; and respond with an HTTP "204 No Content" status code to the service consumer, indicating the successful deletion of this "Individual ACR Management Events Subscription" resource;
 - 3b. on failure, the EES shall take proper error handling actions, as specified in clause 8.6.6, and respond to the service consumer with an appropriate error status code; and
 - 3c. if the EES determines that the received HTTP DELETE request message needs to be redirected, the EES 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 EES where the message should be redirected. Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [6].

5.8.2.5 Eees_ACRManagementEvent_Notify

5.8.2.5.1 General

This service operation is used by EES to send ACR management event notification information or the availability of user path management events monitoring via the 3GPP 5GC network to the service consumer (see also clause 8.6.3.2.3 of 3GPP TS 23.558 [2]).

5.8.2.5.2 EES notifying ACR management events using Eees_ACRManagementEvent_Notify operation

In order to notify on ACR management event(s), the EES shall send an HTTP POST request message targeting the Notification URI received during the creation or update/modification of the corresponding subscription as defined in clauses 5.8.2.2.2 and 5.8.2.2.3. The body of HTTP POST message shall include the AcrMgmtEventsNotification data structure as specified in clause 8.6.5.2.4.

Upon reception of the HTTP POST message, the service consumer shall process the event report information, as specified in clause 8.6.3.2.3 of 3GPP TS 23.558 [2], and respond to the EES with either:

1. an HTTP "204 No Content" message; or
2. an HTTP "200 OK" status code, with the response body including EasAckInformation data type as specified in clause 8.6.5.2.15.

On failure, the service consumer shall take proper error handling actions, as specified in clause 8.6.6, and respond to the EES with an appropriate error status code.

If the service consumer determines that the received HTTP POST request needs to be redirected, the service consumer 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 redirected. Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [6].

5.8.2.5.3 EES notifying the availability of user path management events monitoring via the 3GPP 5GC network using Eees_ACRManagementEvent_Notify operation

In order to notify of the availability of user path management events monitoring via the 3GPP 5GC network, the EES shall send an HTTP POST request message targeting the notification URI "{notificationDestination}/report-availability", where the Notification Destination URI is the one received during the creation or modification of the corresponding ACR management event subscription as defined in clauses 5.8.2.2.2 and 5.8.2.2.3. The body of HTTP POST request message shall include the AvailabilityNotif data type as specified in clause 8.6.5.2.11.

NOTE: The service consumer is subscribed by default to the reception of notifications on the availability of user path management events monitoring via the 3GPP 5GC network.

Upon reception of the HTTP POST request message, the service consumer shall process the received information and respond to the EES with an HTTP "204 No Content" status code.

On failure, the service consumer shall take proper error handling actions, as specified in clause 8.6.6, and respond to the EES with an appropriate error status code.

If the service consumer determines that the received HTTP POST request needs to be redirected, the service consumer 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 EAS where the notification should be redirected. Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [6].

5.9 Eees_AppContextRelocation Service

5.9.1 Service Description

The Eees_AppContextRelocation API, allows the service consumer to declare to the S-EES about the T-EAS selected by the service consumer, or allows the service consumer to request ACR determination to the S-EES.

5.9.2 Service Operations

5.9.2.1 Introduction

The service operation defined for Eees_AppContextRelocation API is shown in the table 5.9.2.1-1.

Table 5.9.2.1-1: Operations of the Eees_AppContextRelocation API

Service operation name	Description	Initiated by
Eees_AppContextRelocation_SelectedTargetEAS_Declare	This service operation is used by the service consumer to inform the S-EES about selection of the T-EAS.	EAS, CAS
Eees_AppContextRelocation_ACRDetermination_Request	This service operation is used by the service consumer to request the S-EES to determine the ACR.	EAS

5.9.2.2 Eees_AppContextRelocation_SelectedTargetEAS_Declare

5.9.2.2.1 General

This service operation is used by the service consumer to declare the selected T-EAS information to the S-EES, as specified in 3GPP TS 23.558 [2].

5.9.2.2.2 S-EAS informing the S-EES about the selected T-EAS using Eees_AppContextRelocation_SelectedTargetEAS_Declare operation

To declare the selected T-EAS information to the S-EES, the service consumer shall send an HTTP POST request message to the S-EES targeting the URI "{apiRoot}/ees-appctxreloc/v1/declare" as specified in clause 6.5.3.4 of 3GPP TS 24.558 [14]. The request body of the POST request message (i.e. "Declare" custom operation) includes the AcrDecReq data structure as specified in clause 6.5.5.2.4 of 3GPP TS 24.558 [14].

Upon receiving the HTTP POST message from the service consumer, the EES shall:

1. Process the service consumer request;
2. verify the identity of the service consumer and check if the service consumer is authorized to declare the T-EAS information;
3. if the service consumer is authorized to declare T-EAS information, then the EES shall send successful declaration response message to S-EAS.

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

If the EES determines that the received HTTP POST message needs to be redirected, the EES 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 EES where the message should be redirected. Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [6].

5.9.2.3 Eees_AppContextRelocation_ACRDetermination_Request

5.9.2.3.1 General

This service operation is used by S-EAS to request the S-EES to determine the ACR, as specified in the Eees_AppContextRelocation_Request operation with ACR determination part in 3GPP TS 23.558 [2].

5.9.2.3.2 S-EAS request the S-EES to determine the ACR using Eees_AppContextRelocation_ACRDetermination_Request operation

To request the S-EES to determine the ACR, the S-EAS shall send a HTTP POST message to the S-EES on the custom URI "{apiRoot}/ees-appctxreloc/v1/determine" as specified in clause 6.5.3.2 of 3GPP TS 24.558 [14]. The request body of the POST message includes the AcrDetermReq data structure with information about the S-EAS end point information and may include other optional information on UE and/or EASID as specified in clause 6.5.5.2.2 of 3GPP TS 24.558 [14].

Upon receiving the HTTP POST message from the EAS, the EES shall:

1. process the EAS request;
2. verify the identity of the EAS and check if the EAS is authorized to request ACR determination;
3. if the EAS is authorized to request the ACR , then the EES shall:
 - a. send successful ACR determination response to S-EAS with an HTTP "204 No Content" status code;
 - b. additionally, the S-EES determines the T-EES via the Discover T-EAS procedure and may notify the EEC with target information and/or ACR result notification as specified in 3GPP TS 24.558 [14];
 - c. if the ACR determination handling met with failure case , the S-EES shall send a proper HTTP error status code and may include additional error information in the POST response body.

If the EES determines that the received HTTP POST message needs to be redirected, the EES 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 EES where the message should be redirected. Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [6].

5.10 Eees_EECContextRelocation Service

5.10.1 Service Description

The Eees_EECContextRelocation API enables a service consumer (e.g., S-EES, T-EES, CES) to perform the EEC context relocation, as defined in clause 8.9 of 3GPP TS 23.558 [2]. The Eees_EECContextRelocation_Pull service operation enables a service consumer (e.g., T-EES, CES) to pull the EEC context from the EES (e.g., S-EES), as specified by Eees_EECContextPull API in 3GPP TS 23.558 [2]. The Eees_EECContextRelocation_Push service operation enables a service consumer (e.g., S-EES, CES) to push the EEC context to the EES (e.g., T-EES), as specified by Eees_EECContextPush API in 3GPP TS 23.558 [2].

5.10.2 Service Operations

5.10.2.1 Introduction

The service operation defined for Eees_EECContextRelocation API is shown in the table 5.10.2.1-1.

Table 5.10.2.1-1: Operations of the Eees_EECContextRelocation API

Service operation name	Description	Initiated by
Eees_EECContextRelocation_Pull	This service operation is used by a service consumer to pull the EEC context information from the EES.	EES, CES
Eees_EECContextRelocation_Push	This service operation is used by a service consumer to push the EEC context information to EES.	EES, CES

5.10.2.2 Eees_EECContextRelocation_Pull

5.10.2.2.1 General

This service operation is used by a service consumer to pull the EEC context information from the EES (see also clause 8.9 of 3GPP TS 23.558 [2]).

5.10.2.2.2 Service consumer pulling the EEC context information from the EES using the Eees_EECContextRelocation_Pull operation

In order to pull the EEC context information from the EES, the service consumer shall send an HTTP GET request message to the EES targeting the URI of the "EEC Contexts" collection resource and including the relevant query parameters, as specified in the clause 8.7.2.2.3.1.

Upon reception of the HTTP GET message from the service consumer, the EES shall:

1. validate the request and verify whether the service consumer is authorized to relocate the EEC context;
2. if the service consumer is authorised, process the request;
3. upon success, respond with an HTTP "200 OK" status code, with the response body including the EECContext data type containing the EEC context information corresponding to the received query parameters; and
4. on failure, the EES shall take proper error handling actions, as specified in clause 8.7.6, and respond to the service consumer with an appropriate error status code.

5.10.2.3 Eees_EECContextRelocation_Push

5.10.2.3.1 General

This service operation is used by a service consumer to push the EEC context information to the EES, (see also clause 8.9 of 3GPP TS 23.558 [2]).

5.10.2.3.2 Service consumer pushing the EEC context information to the EES using the Eees_EECContextRelocation_Push operation

In order to push the EEC context information to the EES, the service consumer shall send an HTTP POST request message to the EES, targeting the URI of the "EEC Contexts" collection resource, as specified in the clause 8.7.2.2.3.2, with the request body including the EECContextPush data structure defined in clause 8.7.5.2.4.

Upon reception of the HTTP POST request message from the service consumer, the EES shall:

1. validate the request and verify whether the service consumer is authorized to relocate the EEC context;
2. if the service consumer is authorised, then process the request;
3. upon success, the EES shall store the received EEC Context and respond with either:
 - an HTTP "200 OK" status code with the response body including the EECContextPushRes data structure; or
 - an HTTP "204 No content" status code;

and

4. on failure, the EES shall take proper error handling actions, as specified in clause 8.7.6, and respond to the service consumer with an appropriate error status code.

5.11 Eees_EELManagedACR Service

5.11.1 Service Description

The Eees_EELManagedACR service exposed by the EES enables a service consumer (i.e. EAS) to:

- request the EES (i.e. S-EES) to handle all the operations of an ACR;
- subscribe to ACT status reporting during an EEL Managed ACR; and
- receive notifications from the EES (i.e. T-EES) on ACT status during an EEL Managed ACR.

5.11.2 Service Operations

5.11.2.1 Introduction

The service operations defined for Eees_EELManagedACR API are shown in the table 5.11.2.1-1.

Table 5.11.2.1-1: Eees_EELManagedACR Service Operations

Service operation name	Description	Initiated by
Eees_EELManagedACR_Request	This service operation enables a service consumer (i.e. S-EAS) to request the EES (i.e. S-EES) to handle all the operations of an ACR.	EAS
Eees_EELManagedACR_Subscribe	This service operation enables a service consumer (i.e. T-EAS) to subscribe to ACT status reporting during an EEL Managed ACR.	EAS
Eees_EELManagedACR_Notify	This service operation enables a service consumer (i.e. T-EAS) to receive notifications from the EES (i.e. T-EES) on ACT status during an EEL Managed ACR.	EES

5.11.2.2 Eees_EELManagedACR_Request

5.11.2.2.1 General

This service operation is used by a service consumer (i.e. S-EAS) to request the EES (i.e. S-EES) to handle all the operations of an ACR.

The following procedures are supported by the "Eees_EELManagedACR_Request" service operation:

- EEL Managed ACR Request procedure.

5.11.2.2.2 EEL Managed ACR Request

The EEL Managed ACR Request procedure enables a service consumer (i.e. S-EAS) to request the EES (i.e. S-EES) to handle all the operations of an ACR (see also clause 8.8.3.6 of 3GPP TS 23.558 [2]).

1. The service consumer (i.e. S-EAS) shall send for this purpose an HTTP POST request (custom operation: "Request") to the EES, with the request URI set to "{apiRoot}/ees-eel-acr/<apiVersion>/request-eelacr" and the request body including the EELACRReq data structure as defined in clause 8.8.6.2.2.
- 2a. Upon success, the EES shall respond with an HTTP "200 OK" status code with the response body including the feedback from the EES within the EELACRResp data structure as defined in clause 8.8.6.2.3.
- 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.

5.11.2.3 Eees_EELManagedACR_Subscribe

5.11.2.3.1 General

This service operation is used by a service consumer (i.e. T-EAS) to subscribe to ACT status information reporting at the EES (i.e. T-EES).

The following procedures are supported by the "Eees_EELManagedACR_Subscribe" service operation:

- Subscribe to ACT status information reporting.

5.11.2.3.2 Subscribe to ACT status information reporting

This procedure enables a service consumer (i.e. T-EAS) to request the creation of a subscription to ACT status information reporting (see also clause 8.8.3.6 of 3GPP TS 29.558 [2]).

1. In order to subscribe to ACT status reporting, the service consumer (i.e. T-EAS) shall send an HTTP POST request to the EES, with the request URI set to "{apiRoot}/ees-eel-acr/<apiVersion>/subscriptions" and the request body including the ACTStatusSubsc data structure as defined in clause 8.8.6.2.4.
- 2a. Upon success, the EES shall respond with an HTTP "201 Created" status code with the response body containing a representation of the created Individual ACT Status Subscription resource within the ACTStatusSubsc data structure as defined in clause 8.8.6.2.4.
- 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.

5.11.2.4 Eees_EELManagedACR_Notify

5.11.2.4.1 General

This service operation is used by an EES (i.e. T-EES) to notify a previously subscribed service consumer (i.e. T-EAS) on ACT status information.

The following procedures are supported by the "Eees_EELManagedACR_Notify" service operation:

- ACT Status Notification.

5.11.2.4.2 ACT Status Notification

The ACT Status Notification procedure enables an EES (i.e. T-EES) to notify a previously subscribed service consumer (i.e. T-EAS) on ACT status information (see also clause 8.8.3.6 of 3GPP TS 29.558 [2]).

1. The EES (i.e. T-EES) shall send for this purpose an HTTP POST request to the service consumer (i.e. T-EAS) with the request URI set to "{notificationUri}/act-status", where the "notificationUri" is set to the value received from the service consumer (i.e. T-EAS) during the ACT status reporting subscription procedure defined in clause 5.11.2.3, and the request body including the ACTStatusNotif data structure as defined in clause 8.8.6.2.5.
- 2a. Upon success, the service consumer (i.e. T-EAS) shall respond with an HTTP "204 No Content" status code to acknowledge the reception of the notification to the EES.
- 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.

If the service consumer (i.e. T-EAS) is not able to handle the notification request or determines that the received HTTP POST request needs to be redirected, the EAS 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 EAS where the notification should be redirected. Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [6].

5.12 Eees_ACRStatusUpdate Service

5.12.1 Service Description

The Eees_ACRStatusUpdate service exposed by the EES enables a service consumer to:

- update the information related to ACR (e.g. indicate the status of ACT, update the notification target address); and
- receive from the EES (i.e. T-EES) the status of EDGE-3 subscription relocation, including subscription ID update for EDGE-3 subscriptions.

5.12.2 Service Operations

5.12.2.1 Introduction

The service operations defined for Eees_ACRStatusUpdate API are shown in the table 5.12.2.1-1.

Table 5.12.2.1-1: Eees_ACRStatusUpdate Service Operations

Service operation name	Description	Initiated by
Eees_ACRStatusUpdate_Request	This service operation enables a service consumer (i.e. S-EAS or T-EAS) to update the information related to ACR (e.g. indicate the status of ACT, update the notification target address) at the EES.	EAS, CAS

5.12.2.2 Eees_ACRStatusUpdate_Request

5.12.2.2.1 General

This service operation is used by a service consumer to update the information related to ACR (e.g. indicate the status of ACT, update the notification target address) at the EES.

The following procedures are supported by the "Eees_ACRStatusUpdate_Request" service operation:

- ACR Status Update Request procedure.

5.12.2.2.2 ACR Status Update Request

The ACR Status Update Request procedure enables a service consumer to request to update the EES to request to update the information related to ACR (see also clause 8.8.3.8 of 3GPP^{TS}23.558^[2]).

1. The service consumer shall send for this purpose an HTTP POST request (custom operation: "Request") to the EES, with the request URI set to "{apiRoot}/ees-acrstatus-update/<apiVersion>/request-acrupdate" and the request body including the ACRUpdateData data structure defined in clause 8.9.6.2.2.
2. Upon receiving the HTTP POST request message from the service consumer, the EES shall check whether the service consumer is authorized to update the ACR status. Then:
 - 2a. Upon success, the EES shall respond with an HTTP "200 OK" status code with the response body including the feedback from the EES within the ACRDataStatus data structure defined in clause 8.9.6.2.3, 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 POST response body.

If the EES determines that the received HTTP POST request needs to be redirected, the EES 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 EES where the message should be redirected. Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [6].

5.13 Eees_ACRParameterInformation Service

5.13.1 Service Description

The Eees_ACRParameterInformation service exposed by the EES enables a service consumer (e.g., S-EES, CES) to:

- send ACR parameters information to the EES (e.g., T-EES).

5.13.2 Service Operations

5.13.2.1 Introduction

The service operations defined for the Eees_ACRParameterInformation API are shown in the table 5.13.2.1-1.

Table 5.13.2.1-1: Eees_ACRParameterInformation Service Operations

Service operation name	Description	Initiated by
Eees_ACRParameterInformation_Request	This service operation enables a service consumer to send ACR parameters information to the EES.	e.g., EES, CES

5.13.2.2 Eees_ACRParameterInformation_Request

5.13.2.2.1 General

This service operation is used by a service consumer to send ACR parameters information to the EES.

The following procedures are supported by the "Eees_ACRParameterInformation_Request" service operation:

- ACR Parameters Information Request.

5.13.2.2.2 ACR Parameters Information Request

The ACR Parameters Information Request procedure enables a service consumer to send ACR parameters information to the EES (see also clause 8.8.3.9 of 3GPP TS 23.558 [2]).

1. The service consumer shall send for this purpose an HTTP POST request to the EES targeting the URI of the corresponding custom operation (i.e., "Request"), with the request body including the ACRParamsInfo data structure defined in clause 8.10.6.2.2.
2. Upon reception of the HTTP POST request message from the service consumer, the EES shall check whether the service consumer is authorized to send the ACR parameters information. Then:
 - 2a. upon success, the EES 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, as defined in clause 8.10.7, should be returned in the HTTP POST response body; and
 - 2c. if the EES 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 target URI of the custom operation located in an alternative EES, as defined in clause 5.2.10 of 3GPP TS 29.122 [2].

5.14 Ees_CommonEASAnnouncement Service

5.14.1 Service Description

The Ees_CommonEASAnnouncement service exposed by the EES enables a service consumer (e.g., announcing EES) to:

- send common EAS information to the EES (e.g., receiving EES).

5.14.2 Service Operations

5.14.2.1 Introduction

The service operations defined for the Ees_CommonEASAnnouncement API are shown in the table 5.14.2.1-1.

Table 5.14.2.1-1: Ees_CommonEASAnnouncement Service Operations

Service operation name	Description	Initiated by
Ees_CommonEASAnnouncement_Declare	This service operation enables a service consumer to send common EAS information to the EES.	e.g., EES

5.14.2.2 Ees_CommonEASAnnouncement_Declare

5.14.2.2.1 General

This service operation is used by a service consumer to send common EAS information to the EES.

The following procedures are supported by the "Ees_CommonEASAnnouncement_Declare" service operation:

- Common EAS Information Declaration.

5.14.2.2.2 Common EAS Information Declaration

This procedure enables a service consumer to send common EAS information to the EES (see also clause 8.19.2 of 3GPP TS 23.558 [2]).

1. In order to declare Common EAS Information, the service consumer shall send an HTTP POST request to the EES targeting the URI of the corresponding custom operation (i.e., "Declare"), with the request body including the CommonEASInfo data structure defined in clause 8.11.6.2.2.
2. Upon reception of the HTTP POST request message from the service consumer, the EES shall check whether the service consumer is authorized to declare common EAS information. Then:
 - 2a. upon success, the EES shall respond with an HTTP "204 No Content" status code indicating that the common EAS information is successfully received and processed;
 - 2b. on failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information, as defined in clause 8.11.7, should be returned in the HTTP POST response body; and
 - 2c. If the EES 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 target URI of the custom operation located in an alternative EES, as defined in clause 5.2.10 of 3GPP TS 29.122 [2].

5.15 Eees_TrafficInfluenceEAS Service

5.15.1 Service Description

The Eees_TrafficInfluenceEAS service exposed by the EES enables a service consumer to:

- request to initiate/update/cancel/retrieve EAS application traffic influence.

5.15.2 Service Operations

5.15.2.1 Introduction

The service operations defined for the Eees_TrafficInfluenceEAS API are shown in the table 5.15.2.1-1.

Table 5.15.2.1-1: Eees_TrafficInfluenceEAS Service Operations

Service operation name	Description	Initiated by
Eees_TrafficInfluenceEAS_Manage	This service operation enables a service consumer to request to initiate/update/cancel/retrieve EAS application traffic influence.	e.g., EAS

5.15.2.2 Eees_TrafficInfluenceEAS_Manage

5.15.2.2.1 General

This service operation enables a service consumer to request the EES to initiate/update/cancel/retrieve EAS application traffic influence.

The following procedures are supported by the "Eees_TrafficInfluenceEAS_Manage" service operation:

- Application Traffic Influence Initiation.
- Application Traffic Influence Update.
- Application Traffic Influence Cancellation.
- Application Traffic Influence Retrieval.

5.15.2.2.2 Application Traffic Influence Initiation

This procedure enables a service consumer to request the EES to initiate EAS application traffic influence (see also clause 8.6.7 of 3GPP°TS°23.558°[2]).

1. The service consumer shall send for this purpose an HTTP POST request to the EES targeting the URI of the "Application Traffic Influence Instances" collection resource, with the request body including the AppTrafficInfluence data structure defined in clause 8.12.5.2.2.
2. Upon reception of the HTTP POST request message from the service consumer, the EES shall check whether the service consumer is authorized to request application traffic influence. Then:
 - 2a. if the service consumer is authorized:
 - the EES shall trigger the relevant traffic influence procedures towards the 3GPP core network as specified in clause 8.6.7.2 of 3GPP°TS°23.558°[2]; and
 - upon success, the EES shall respond to the service consumer with an HTTP "201 Created" status code with the response body including a representation of the created "Individual Application Traffic Influence Instance" resource, 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, as defined in clause 8.12.6, should be returned in the HTTP POST response body.

5.15.2.2.3 Application Traffic Influence Update

This procedure enables a service consumer to request the EES to update an existing EAS application traffic influence.

1. The service consumer shall send for this purpose an HTTP PUT/PATCH request to the EES targeting the URI of the "Individual Application Traffic Influence Instance" resource with the request body including either:
 - the updated representation of the resource within the AppTrafficInfluence data structure as specified in clause 8.12.3.3.3.2, in case the HTTP PUT method is used; or
 - the requested modifications to the resource within the AppTrafficInfluencePatch data structure as specified in clause 8.12.3.3.3.3, in case the HTTP PATCH method is used.
2. Upon reception of the HTTP PUT/PATCH request message from the service consumer, the EES shall check whether the update of the existing "Individual Application Traffic Influence Instance" resource is authorized or not:
 - 2a. if the update is authorized:
 - the EES shall trigger the relevant traffic influence procedures towards the 3GPP core network; and
 - upon success, the EES shall respond to the service consumer with either:
 - an HTTP "200 OK" status code with the response body containing a representation of the updated "Individual Application Traffic Influence Instance" resource within the AppTrafficInfluence 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, as defined in clause 8.12.6, should be returned in the HTTP PUT/PATCH response body.

5.15.2.2.4 Application Traffic Influence Cancellation

This procedure enables a service consumer to request the EES to cancel EAS application traffic influence.

1. The service consumer shall send for this purpose an HTTP DELETE request to the EES targeting the URI of the "Individual Application Traffic Influence Instance" resource as specified in clause 8.12.3.3.3.4.
2. Upon reception of the HTTP DELETE request message from the service consumer, the EES shall check whether the deletion of the existing "Individual Application Traffic Influence" resource is authorized or not:
 - 2a. if the deletion is authorized:
 - the EES shall trigger the relevant traffic influence procedures towards the 3GPP core network; and
 - upon success, the EES shall respond to the service consumer with 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, as defined in clause 8.12.6, should be returned in the HTTP DELETE response body.

5.15.2.2.5 Application Traffic Influence Retrieval

This procedure enables a service consumer to the EES to retrieve an existing EAS application traffic influence.

1. The service consumer shall send for this purpose an HTTP GET request to the EES targeting the URI of the "Individual Application Traffic Influence Instance" resource as specified in clause 8.12.3.3.3.1.
2. Upon reception of the HTTP GET request message from the service consumer, the EES shall check whether the retrieval of the existing Individual Application Traffic Influence Instance is authorized or not:
 - 2a. if the retrieval is authorized:

- upon success, the EES shall respond to the service consumer with an HTTP "200 OK" status code with the response body including the representation of the requested "Individual Application Traffic Influence Instance" resource.

2b. On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information, as defined in clause 8.12.6, should be returned in the HTTP GET response body.

6 Services offered by Edge Configuration Server

6.1 Introduction

The table 6.1-1 lists the Edge Configuration Server APIs below the service name. A service description clause for each API gives a general description of the related API.

Table 6.1-1: List of ECS Service APIs

Service Name	Service Operations	Operation Semantics	Consumer(s)
Eecs_EESRegistration	Request	Request/Response	e.g., EES
	Update	Request/Response	e.g., EES
	Deregister	Request/Response	e.g., EES
Eecs_TargetEESDiscovery	Request	Request/Response	e.g., EES, CES
(NOTE)			
Eecs_EASInfoManagement	Get	Request/Response	EES
	Store	Request/Response	EES
Eecs_ECSServiceProvisioning	Request	Request/Response	e.g., ECS
	Subscribe	Subscribe/Notify	
	UpdateSubscription		
	Unsubscribe		
	Notify		
Eecs_ECSDiscovery	Request	Request/Response	ECS
NOTE:	In this release of the specification, this API is extended to enable to discover the target Enabler Server, which can be either the target EES or the target CES, not only the target EES, in order to support cloud enabler services.		

Table 6.1-2 summarizes the corresponding Edge Configuration Server APIs defined in this specification.

Table 6.1-2: API Descriptions

Service Name	Clause	Description	OpenAPI Specification File	apiName	Annex
Eecs_EESRegistration	9.1	ECS EES registration service.	TS29558_Eecs_EESRegistration.yaml	eecs-eesregistration	A.11
Eecs_TargetEESDiscovery	9.2	ECS Service to discover the target EES information.	TS29558_Eecs_TargetEESDiscovery.yaml	eecs-targeteesdiscovery	A.12
Eecs_EASInfoManagement	9.3	ECS EAS Information Management Service.	TS29558_Eecs_EASInfoManagement.yaml	eecs-eim	A.16
Eecs_ECSServiceProvisioning	9.4	ECS Service Provisioning Service	TS29558_Eecs_ECSServiceProvisioning.yaml	eecs-esp	A.18
Eecs_ECSDiscovery	9.5	Eecs_ECSDiscovery	TS29558_Eecs_ECSDiscovery	eecs-ecsdiscove ry	A.19

NOTE: In this release of the specification, the ECS registration service is not specified and the profiles of the ECSs of a partner ECSP are assumed to be available at an ECS of this partner ECSP. The Eecs_ECSDiscovery service API is defined to enable the discovery of partner ECS information at the partner ECSP.

6.2 Eecs_EESRegistration Service

6.2.1 Service Description

The Eecs_EESRegistration API, as defined in 3GPP TS 23.558 [2], allows an Edge Enabler Server via Eecs interface to register, update its registration and deregister at a given Edge Configuration Server.

6.2.2 Service Operations

6.2.2.1 Introduction

The service operation defined for Eecs_EESRegistration API is shown in the table 6.2.2.1-1.

Table 6.2.2.1-1: Operations of the Eecs_EESRegistration API

Service operation name	Description	Initiated by
Eecs_EESRegistration_Request	This service operation is used by the EES to register itself to a given ECS.	EES
Eecs_EESRegistration_Update	This service operation is used by the EES to update its registration information at ECS.	EES
Eecs_EESRegistration_Deregister	This service operation is used by the EES to deregister itself from a given ECS.	EES

6.2.2.2 Eecs_EESRegistration_Request

6.2.2.2.1 General

This service operation is used by EES to register itself to a given ECS.

6.2.2.2.2 EES registering to ECS using Eecs_EESRegistration_Request operation

To register itself as an Edge Enabler Server at the ECS, the EES shall send an HTTP POST message to the Edge Configuration Server on the "EES Registrations" collection resource. The body of the HTTP POST message shall include the EES profile information, may include proposed expiration time for the registration, as specified in clause 9.1.2.2.3.1.

Upon receiving the HTTP POST message from the EES, the ECS shall:

1. Process the EES registration request information;
2. verify the identity of the Edge Enabler Server and check if the EES is authorized to register itself at ECS ;
3. if the EES is authorized to register to ECS, then the ECS shall;
 - a. store the EES profile and create a new resource with the EES registration information as specified in clause 9.1.2.1;
 - b. return the EES registration information, the resource URI of the EES registration information, in the "201 Created" response message. It shall include a Location HTTP header field. The Location header field shall contain the URI of the created registration i.e. {apiRoot}/eecs-eesregistration/<apiVersion>/registrations/{registrationId}. The response message may include expiration time to indicate when the EES registration will automatically expire.

On failure, the ECS shall take proper error handling actions, as specified in clause 9.1.6, and respond to the EES with an appropriate error status code.

If the expiration time is provided, then to maintain the registration, the EES shall send a registration update request (as described in clause 6.2.2.3) prior to the expiration time. If the registration update request is not sent before the expiry time, then the ECS shall treat the EES as deregistered and remove the corresponding EES registration resource.

6.2.2.3 Eecs_EESRegistration_Update

6.2.2.3.1 General

This service operation is used by EES to update its registration information at a given ECS.

6.2.2.3.2 EES updating registration information using Eecs_EESRegistration_Update operation

To update the EES registration information at the ECS, the EES shall send a HTTP PUT or PATCH message to the Edge Configuration Server on resource URI identifying the individual EES registration resource representation, as specified in clause 9.1.2.3.3.2 for HTTP PUT message and in clause 9.1.2.3.3.4 for HTTP PATCH message. The HTTP PUT message shall replace all properties in the existing resource with the EES registration information in the request. The EESRegistration data type in the request body of the HTTP PUT message shall include the EES profile information, and may include proposed expiration time to update the registration. This request shall not replace the eesId property of the existing resource.

The HTTP PATCH request message in the EESRegistrationPatch data type includes parameters (EES Profile, and/or expiry time) that need to be replaced in the existing Individual EAS registration resource. This request shall not replace the eesId property of the existing resource.

Upon receiving the HTTP PUT or PATCH message from the EES, the ECS shall:

1. check the registration update message from the EES to see if the EES is authorized to modify the requested registration resource;
2. if the EES is authorized to update the registration information:
 - a. update the resource identified by Resource URI of the EES registration information with the updated EES registration information received in the HTTP PUT or PATCH request message;
 - b. return the updated EES registration information in the "200 OK" response message or respond with the "204 No Content" message indicating to the EES that the EES registration information is updated successfully. In the response message, the ECS may provide an updated expiration time to indicate to the EES when the updated registration will automatically expire.

On failure, the ECS shall take proper error handling actions, as specified in clause 9.1.6, and respond to the EES with an appropriate error status code.

If the ECS determines that the received HTTP PUT or PATCH request needs to be redirected, the ECS 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 ECS where the message should be redirected. Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [6].

If the expiration time is provided, then to maintain the registration, the EES shall send a registration update prior to registration expiry time. If the registration update request is not sent before the expiry time, then the ECS shall treat EES as deregistered and remove the corresponding EES registration resource.

6.2.2.4 Eecs_EESRegistration_Deregister

6.2.2.4.1 General

This service operation is used by EES to deregister itself from a given ECS.

6.2.2.4.2 EES deregistering from ECS using Eecs_EESRegistration_Deregister operation

To deregister itself from the ECS, the EES shall send HTTP DELETE message to the ECS, on the resource URI identifying the individual EES registration resource representation as specified in clause 9.1.2.3.3.3. Upon receiving the HTTP DELETE request, the ECS shall:

1. verify the identity of the EES and check if the EES is authorized to deregister the EES registration information;
2. if the EES is authorized to deregister the EES registration information, then the ECS shall deregister the EES profile from the ECS and delete the resource representing EES registration information.
3. return the "204 Not Content" message to the EES, indicating the successful deregistration of the EES information.

On failure, the ECS shall take proper error handling actions, as specified in clause 9.1.6, and respond to the EES with an appropriate error status code.

If the ECS determines that the received HTTP DELETE request needs to be redirected, the ECS 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 ECS where the message should be redirected. Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [6].

6.3 Eecs_TargetEESDiscovery Service

6.3.1 Service Description

The Eecs_TargetEESDiscovery API, as defined in 3GPP TS 23.558 [2], allows a service consumer (e.g., EES, ECS) to retrieve the target Enabler Server (e.g., T-EES, target CES) information at the ECS.

6.3.2 Service Operations

6.3.2.1 Introduction

The service operation defined for Eecs_TargetEESDiscovery API is shown in the table 6.3.2.1-1.

Table 6.3.2.1-1: Operations of the Eecs_TargetEESDiscovery API

Service operation name	Description	Initiated by
Eecs_TargetEESDiscovery_Request	This service operation is used by a service consumer to retrieve the target Enabler Server information.	EES, CES

6.3.2.2 Eecs_TargetEESDiscovery_Request

6.3.2.2.1 General

This service operation is used by a service consumer to retrieve the target Enabler Server information from the ECS.

6.3.2.2.2 Service consumer fetching the target Enabler Server information from the ECS using Eecs_TargetEESDiscovery_Request operation

To retrieve the target Enabler Server information from the ECS, the service consumer shall send a HTTP GET message to the ECS on the "EES Profiles" collection resource as specified in clause 9.2.2.3.1. The service consumer includes the discovery filter information in the query parameters of the GET message, as specified in clause 9.2.2.3.1, to assist the ECS to determine the target Enabler Server that has the Application Server (e.g., EAS, CAS) available to serve the given AC in the UE.

Upon receiving the HTTP GET message from the service consumer, the ECS shall:

1. Process the request information;
2. verify the identity of the service consumer and check if it is authorized to retrieve the target Enabler Server information;
3. if the service consumer is authorized to retrieve the target Enabler Server information, then the ECS shall;
 - a. determine the target Enabler Server based on the provided query parameters in the request. If UE location information is not included in the request or not known to the ECS, then the ECS may fetch the UE location information from the 3GPP core network as specified in 3GPP TS 29.522 [10];
 - b. returns an HTTP "200 OK" status code with the response body including the EDN configuration and the list of T-EES(s) or target CES(s) information to the service consumer. The list of target Enabler Server includes the endpoint information to reach the target Enabler Server.

and

4. on failure, the ECS shall take proper error handling actions, as specified in clause 9.2.6, and respond to the service consumer with an appropriate error status code.

6.4 Eecs_EASInfoManagement Service

6.4.1 Service Description

The Eecs_EASInfoManagement API exposed by the ECS, as defined in 3GPP TS 23.558 [2], enables a service consumer to:

- retrieve the Common EAS Binding information; and
- store the Common EAS Binding information or receive the existing Common EAS Binding information.

NOTE: Within an ECSP's edge deployment, this service API is exposed by ECS(s) that play the role of center of information, as specified in 3GPP TS 23.558 [2].

6.4.2 Service Operations

6.4.2.1 Introduction

The service operations defined for Eecs_EASInfoManagement API are shown in the table 6.4.2.1-1.

Table 6.4.2.1-1: Eecs_EASInfoManagement API Service Operations

Service operation name	Description	Initiated by
Eecs_EASInfoManagement_Get	This service operation enables a service consumer to retrieve Common EAS Binding information.	e.g., EES
Eecs_EASInfoManagement_Store	This service operation enables a service consumer to store the Common EAS Binding information or receive the existing Common EAS Binding information.	e.g., EES

6.4.2.2 Eecs_EASInfoManagement_Get

6.4.2.2.1 General

This service operation is used by a service consumer to retrieve Common EAS Binding information from the ECS.

The following procedures are supported by the "Eecs_EASInfoManagement_Get" service operation:

- Common EAS Binding Information Retrieval.

6.4.2.2.2 Common EAS Binding Information Retrieval

1. In order to retrieve the Common EAS Binding information from an ECS, the service consumer shall send an HTTP GET request message to the ECS targeting the URI of the "Common EAS Bindings" collection resource, with query parameters as defined in clause 9.3.3.2.3.1.
- 2a. Upon reception of the HTTP GET request message from the service consumer, the ECS shall:
 - check the identity of the service consumer and whether the service consumer is authorized to retrieve the Common EAS Binding information; and
 - if the service consumer is authorized and upon successful processing of the request, respond with either:
 - an HTTP "200 OK" status code, with the response body including the requested Common EAS Binding information within the CommonEASBindResp data structure; or
 - an HTTP "204 No Content" status code, if there is no Common EAS Binding information corresponding to the received query parameters.
- 2b. On failure, the ECS shall take proper error handling actions, as specified in clause 9.3.7, and respond to the service consumer with an appropriate error status code.

6.4.2.3 Eecs_EASInfoManagement_Store

6.4.2.3.1 General

This service operation is used by the service consumer to store the Common EAS information to the ECS.

The following procedures are supported by the "Eecs_EASInfoManagement_Store" service operation:

- Common EAS Binding Information Storage.

6.4.2.3.2 Common EAS Binding Information Storage

1. In order to store the Common EAS Binding information at the ECS, the service consumer shall send an HTTP POST request message to the ECS targeting the URI of the "Common EAS Bindings" collection resource, with the request body including the CommonEASBindReq data structure as defined in clause 9.3.3.2.3.2.
- 2a. Upon reception of the HTTP POST request message from the service consumer, the ECS shall:
 - check the identity of the service consumer and whether the service consumer is authorized to store the Common EAS Binding information at the ECS; and
 - if the service consumer is authorized and upon successful processing of the request, respond with an HTTP "201 Created" status code with the response body including the stored Common EAS Binding information within the CommonEASBindResp data structure.
- 2b. On failure, the ECS shall take proper error handling actions, as specified in clause 9.3.7, and respond to the service consumer with an appropriate error status code. In particular:
 - if there is already an existing Common EAS Binding information for the targeted application group, the ECS shall reject the request and respond with an HTTP "403 Forbidden" status code with the response body including the ProblemDetailsEIMExt data structure containing:
 - the ProblemDetails data structure containing the "cause" attribute set to the "EXISTING_COMMON_EAS" application error; and
 - the CommonEASBinding data structure containing the existing Common EAS Binding information.

6.5 Eecs_ECSServiceProvisioning

6.5.1 Service Description

The Eecs_ECSServiceProvisioning service exposed by the ECS (e.g., partner ECS) enables a service consumer (e.g., ECS) to:

- request to retrieve service provisioning information;
- create/update/delete a service provisioning subscription; and
- receive service provisioning event(s) related notifications.

This API shall be exposed by an ECS (e.g., partner ECS) only in roaming or federation scenarios.

6.5.2.1 Introduction

The service operations defined for the Eecs_ECSServiceProvisioning service are shown in table 6.5.2.1-1.

Table 6.5.2.1-1: Eecs_ECSServiceProvisioning Service Operations

Service Operation Name	Description	Initiated by
Eecs_ECSServiceProvisioning_Request	This service operation enables a service consumer to request to retrieve service provisioning information from the ECS.	e.g., ECS
Eecs_ECSServiceProvisioning_Subscribe	This service operation enables a service consumer to request the creation of a Service Provisioning Subscription at the ECS.	e.g., ECS
Eecs_ECSServiceProvisioning_UpdateSubscription	This service operation enables a service consumer to request the update of an existing Service Provisioning Subscription at the ECS.	e.g., ECS
Eecs_ECSServiceProvisioning_Unsubscribe	This service operation enables a service consumer to request the deletion of an existing Service Provisioning Subscription at the ECS.	e.g., ECS
Eecs_ECSServiceProvisioning_Notify	This service operation enables a service consumer to receive service provisioning event(s) related notifications from the ECS.	ECS

6.5.2.2 Eecs_ECSServiceProvisioning_Request

6.5.2.2.1 General

This service operation is used by a service consumer to request to retrieve service provisioning information from the ECS.

The following procedures are supported by the "Eecs_ECSServiceProvisioning_Request" service operation:

- Service Provisioning Information Retrieval Request.

6.5.2.2.2 Service Provisioning Information Retrieval Request

This procedure enables a service consumer to send a request to the ECS to request to retrieve service provisioning information (see also clause 8.17 of 3GPP TS 29.558 [2]).

1. In order to request to retrieve service provisioning information, the service consumer shall send an HTTP POST request to the ECS targeting the URI of the corresponding custom operation (i.e., "Request"), with the request body including the ServProvReq data structure.
- 2a. Upon success, the ECS shall respond with an HTTP "200 OK" status code with the response body containing the requested service provisioning information within the ServProvResp 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 9.4.7.

6.5.2.3 Eecs_ECSServiceProvisioning_Subscribe

6.5.2.3.1 General

This service operation is used by a service consumer to request the creation of a Service Provisioning Subscription at the ECS.

The following procedures are supported by the "Eecs_ECSServiceProvisioning_Subscribe" service operation:

- Service Provisioning Subscription Creation.

6.5.2.3.2 Service Provisioning Subscription Creation

This procedure enables a service consumer to send a request to the ECS to request the creation of a Service Provisioning Subscription (see also clause 8.17 of 3GPP°TS°23.558°[2]).

1. In order to create a new Service Provisioning Subscription, the service consumer shall send an HTTP POST request to the ECS targeting the URI of the "Service Provisioning Subscriptions" collection resource, with the request body including the ServProvSubsc data structure.
- 2a. Upon success, the ECS shall respond with an HTTP "201 Created" status code, with the response body containing a representation of the created "Individual Service Provisioning Subscription" resource within the ServProvSubsc 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 9.4.7.

6.5.2.4 Eecs_ECSServiceProvisioning_UpdateSubscription

6.5.2.4.1 General

This service operation is used by a service consumer to request the update of an existing Service Provisioning Subscription at the ECS.

The following procedures are supported by the "Eecs_ECSServiceProvisioning_UpdateSubscription" service operation:

- Service Provisioning Subscription Update.

6.5.2.4.2 Service Provisioning Subscription Update

This procedure enables a service consumer to send a request to the ECS to request the update of an existing Service Provisioning Subscription (see also clause 8.17 of 3GPP°TS°23.558°[2]).

1. In order to request the update of an existing Service Provisioning Subscription, the service consumer shall send an HTTP PUT/PATCH request to the ECS, targeting the URI of the corresponding "Individual Service Provisioning Subscription" resource, with the request body including either:
 - the updated representation of the resource within the ServProvSubsc data structure, in case the HTTP PUT method is used; or
 - the requested modifications to the resource within the ServProvSubscPatch data structure, in case the HTTP PATCH method is used.
- 2a. Upon success, the ECS shall update the targeted "Individual Service Provisioning Subscription" resource accordingly and respond with either:
 - an HTTP "200 OK" status code with the response body containing a representation of the updated "Individual Service Provisioning Subscription" resource within the ServProvSubsc 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 9.4.7.

6.5.2.5 Eecs_ECSServiceProvisioning_Unsubscribe

6.5.2.5.1 General

This service operation is used by a service consumer to request the deletion of an existing Service Provisioning Subscription at the ECS.

The following procedures are supported by the "Eecs_ECSServiceProvisioning_Unsubscribe" service operation:

- Service Provisioning Subscription Deletion.

6.5.2.5.2 Service Provisioning Subscription Deletion

This procedure enables a service consumer to send a request to the ECS to request the deletion of an existing Service Provisioning Subscription (see also clause 8.17 of 3GPP°TS°23.558°[2]).

1. In order to request the deletion of an existing Service Provisioning Subscription, the service consumer shall send an HTTP DELETE request to the ECS targeting the corresponding "Individual Service Provisioning Subscription" resource.
- 2a. Upon success, the ECS 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 9.4.7.

6.5.2.6 Eecs_ECSServiceProvisioning_Notify

6.5.2.6.1 General

This service operation is used by an ECS to notify a previously subscribed service consumer on:

- service provisioning related event(s).

The following procedures are supported by the "Eecs_ECSServiceProvisioning_Notify" service operation:

- Service Provisioning Notification.

6.5.2.6.2 Service Provisioning Notification

This procedure enables the ECS to send a request to notify a previously subscribed service consumer on service provisioning related event(s) (see also clause 8.17 of 3GPP°TS°23.558°[2]).

1. In order to notify a previously subscribed service consumer on service provisioning related event(s), the ECS shall send an HTTP POST request to the service consumer with the request URI set to "{notifUri}", where the "notifUri" is set to the value received from the service consumer during the creation/update of the corresponding Service Provisioning Subscription using the procedures defined in clauses 6.5.2.3 and 6.5.2.4, and the request body including the ServProvNotif data structure.
- 2a. Upon success, the service consumer shall respond to the ECS 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 9.4.7.

6.6 Eecs_ECSDiscovery Service

6.6.1 Service Description

The Eecs_ECSDiscovery API, as defined in 3GPP TS 23.558 [2], allows a service consumer (e.g., partner ECS) to:

- retrieve partner ECS information from the ECS; and
- receive partner ECS information update notifications.

6.6.2 Service Operations

6.6.2.1 Introduction

The service operation defined for Eecs_ECSDiscovery API is shown in the table 6.6.2.1-1.

Table 6.6.2.1-1: Operations of the Eecs_ECSDiscovery API

Service operation name	Description	Initiated by
Eecs_ECSDiscovery_Request	This service operation is used by the service consumer to retrieve partner ECS information.	e.g., ECS
Eecs_ECSDiscovery_Notify	This service operation is used by the ECS to notify a previously subscribed service consumer on partner ECS information.	e.g., ECS

6.6.2.2 Eecs_ECSDiscovery_Request

6.6.2.2.1 General

This service operation is used by the service consumer to retrieve partner ECS information from the ECS.

6.6.2.2.2 Service consumer fetching partner ECS information from the ECS using the Eecs_ECSDiscovery_Request operation

To retrieve partner ECS information, the service consumer shall send an HTTP POST request message to the ECS targeting the "ECS Information" collection resource, with the request body including the ECSInfoDiscoveryReq data structure.

Upon reception of the HTTP POST message from the service consumer, the ECS shall:

1. verify the identity of the service consumer and check if it is authorized to trigger this request;
2. if the service consumer ECS is authorized, the ECS shall:
 - a. determine the ECS information that may be shared with the service consumer based on the federation information and the ECSP policies; and
 - b. return an HTTP "200 OK" status code with the response body including the ECSInfoDiscoveryResp data structure containing the requested ECS information.

On failure, the ECS shall take proper error handling actions, as specified in clause 9.5.6, and respond to the service consumer with an appropriate error status code.

6.6.2.3 Eecs_ECSDiscovery_Request

6.6.2.3.1 General

This service operation is used by the service consumer to notify a previously subscribed service consumer on partner ECS information.

6.6.2.3.2 ECS notifying the ECS information to the service consumer using Eecs_ECSDiscovery_Notification operation

When the ECS determines to notify the service consumers with updated ECS information, the ECS shall send an HTTP POST request message targeting the notification URI received in the corresponding ECS discovery request, with the request body including the EcsInfoDiscNotif data structure.

Upon reception the HTTP POST message, the service consumer shall process the notification and shall respond to the ECS with an HTTP "204 No Content" status code.

On failure, the service consumer shall take proper error handling actions, as specified in clause 9.5.6, and respond to the ECS with an appropriate error status code.

6A Services offered by the Cloud Application Server (CAS)

6A.1 Introduction

The table 6A.1-1 lists the CAS APIs below with the service name. A service description clause for each API gives a general description of the related API.

Table 6A.1-1: List of CAS Service APIs

Service Name	Service Operations	Operation Semantics	Consumer(s)
Ecas_SelectedEES	Declare	Request/Response	EES

Table 6A.1-2 summarizes the corresponding CAS APIs defined in this specification.

Table 6A.1-2: API Descriptions

Service Name	Clause	Description	OpenAPI Specification File	apiName	Annex
Ecas_SelectedEES	8A.1	The service consumer declares the selected EES information to the CAS.	TS29558_Ecas_SelectedEES.yaml	Ecas-selected-ees	A.14

6A.2 Ecas_SelectedEES Service

6A.2.1 Service Description

The Ecas_SelectedEES API, as defined in 3GPP TS 23.558 [2], allows a service consumer (e.g., EES) to inform the CAS of the selected EES during ACR.

6A.2.2 Service Operations

6A.2.2.1 Introduction

The service operation defined for Ecas_SelectedEES API is shown in the table 6A.2.2.1-1.

Table 6A.2.2.1-1: Operations of the Ecas_SelectedEES API

Service operation name	Description	Initiated by
Ecas_SelectedEES_Declare	This service operation is used by the service consumer to inform the CAS of the selected EES during the ACR from EAS to CAS.	e.g., EES

6A.2.2.2 Ecas_SelectedEES_Request

6A.2.2.2.1 General

This service operation is used by a service consumer to inform the CAS of the selected EES.

6A.2.2.2.2 Service consumer informing the CAS of the selected EES using Ecas_SelectedEES_Declare operation

To inform the CAS of the selected EES during the ACR, the service consumer shall send an HTTP POST request to the CAS targeting the URI of the corresponding custom operation (i.e., "Declare"), with the request body including the SeEESDecInfo data structure defined in clause 8A.1.6.2.2.

Upon reception of the HTTP POST request message from the service consumer, the CAS shall:

1. check whether the service consumer is authorized to declare the selected EES information;
2. if the service consumer is authorized, process the request, store the received information and respond with an HTTP "204 No Content" status code; and
3. on failure, the CAS shall take proper error handling actions, as specified in clause 8A.1.7, and respond to the service consumer with an appropriate error status code.

6B Services offered by the Cloud Enabler Server (CES)

6B.1 Introduction

Table 6B.1-1 lists the CES APIs defined in this specification.

Table 6B.1-1: List of CES Service APIs

Service Name	Service Operations	Operation Semantics	Consumer(s)

Table 6B.1-2 summarizes the corresponding CES APIs defined in this specification.

Table 6B.1-2: API Descriptions

Service Name	Clause	Description	OpenAPI Specification File	apiName	Annex

Table 6B.1-3 lists the EES APIs that are defined in this specification and may be reused (i.e., exposed) by the CES.

Table 6B.1-3: API Descriptions of service APIs reused by the CES

Service Name	Clause	OpenAPI Specification File	apiName	Annex
Eees_EASRegistration	5.2	TS29558_Eees_EASRegistration.yaml	eees-easregistration	A.2
Eees_UELocation	5.3	TS29558_Eees_UELocation.yaml	eees-uelocation	A.3
Eees_UEIdentifier	5.4	TS29558_Eees_UEIdentifier.yaml	eees-ueidentifier	A.4
Eees_AppClientInformation	5.5	TS29558_Eees_AppClientInformation.yaml	eees-appclientinformation	A.5
Eees_SessionWithQoS	5.6	TS29558_Eees_SessionWithQoS.yaml	eees-session-with-qos	A.6
Eees_ACRManagementEvent	5.8	TS29558_Eees_ACRManagementEvent.yaml	eees-acrmgmtevent	A.7
Eees_EECContextRelocation	5.10	TS29558_Eees_EECContextRelocation.yaml	eees-eecontextreloc	A.8
Eees_EELManagedACR	5.11	TS29558_Eees_EELManagedACR.yaml	eees-eel-acr	A.9
Eees_ACRStatusUpdate	5.12	TS29558_Eees_ACRStatusUpdate.yaml	eees-acrstatus-update	A.10
Eees_ACRParameterInformation	5.13	TS29558_Eees_ACRParameterInformation.yaml	eees-acr-param	A.13
Eees_CommonEASAnnouncement	5.14	TS29558_Eees_CommonEASAnnouncement.yaml	eees-common-eas	A.15
Eees_TrafficInfluenceEAS	5.15	TS29558_Eees_TrafficInfluenceEAS.yaml	eees-tie	A.17
Eees_EASDiscovery	(NOTE)	TS24558_Eees_EASDiscovery.yaml	eees-easdiscovery	(NOTE)
Eees_AppContextRelocation	(NOTE)	TS24558_AppContextRelocation	eees-appctxreloc	(NOTE)
NOTE: These APIs are defined in 3GPP TS 24.558 [14].				

7 Information applicable to several APIs

7.1 General

The EDGEAPP APIs as specified in this document allow secure access to the capabilities provided by the functional entities, Edge Enabler Server and Edge Configuration Server.

This document specifies the procedures triggered at different functional entities as a result of API invocation requests and event notifications. The stage-2 level requirements and signalling flows are defined in 3GPP TS 23.558 [2].

Several design aspects, as mentioned in the following clauses, are specified in 3GPP TS 29.122 [6] and referenced by this specification.

7.2 Data Types

7.2.1 General

This clause defines structured data types, simple data types and enumerations that are applicable to several APIs defined in the present specification and can be referenced from data structures defined in the subsequent clauses.

In addition, data types that are defined in OpenAPI 3.0.0 Specification [3] can also be referenced from data structures defined in the subsequent clauses.

NOTE: As a convention, data type's names in the present specification are with an upper-case letter in the beginning. Parameters are with a lower-case letter in the beginning. As an exception, data types that are also defined in OpenAPI 3.0.0 Specification [3] can use a lower-case case letter in the beginning for consistency.

Table 7.2.1-1 specifies data types re-used by APIs in this specification from other specifications, including a reference to their respective specifications and when needed, a short description of their use within the APIs of this specification.

Table 7.2.1-1: Re-used Data Types

Data type	Reference	Comments
Uri	3GPP TS 29.122 [6]	

7.2.2 Referenced structured data types

Table 7.2.2-1 lists structured data types defined in this specification referenced by multiple services:

Table 7.2.2-1: Referenced Structured Data Types

Data type	Reference	Description

7.2.3 Referenced simple data types and enumerations

Following simple data types defined in Table 7.2.3-1 are applicable to several APIs in this document:

Table 7.2.3-1: Simple data types applicable to several APIs

Type name	Reference	Description

7.3 Usage of HTTP

For all the APIs in this document, the usage of HTTP shall be as specified in clause 5.2.2 of 3GPP TS 29.122 [6], with the clarification that SCA/AS is the functional entity invoking an EDGEAPP API.

For all the APIs, to provide the interface protection over EDGE-3/6/9/10 interfaces, HTTP over TLS shall be used as specified in 3GPP TS 33.558 [20].

7.4 Content type

The content type for the HTTP messages shall be as specified in clause 5.2.3 of 3GPP TS 29.122 [6].

7.5 URI structure

7.5.1 Resource URI structure

The resource URI structure of all the APIs specified in this document shall be as specified in clause 5.2.4 of 3GPP TS 29.122 [6].

7.5.2 Custom operations URI structure

The custom operation definition is in Annex C of 3GPP TS 29.501 [5].

The URI of a custom operation which is associated with a resource shall have the following structure:

{apiRoot}/<apiName>/<apiVersion>/<apiSpecificResourceUriPart>/<custOpName>

Custom operations can also be associated with the service instead of a resource. The URI of a custom operation which is not associated with a resource shall have the following structure:

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

In the above URI structures, "apiRoot", "apiName", "apiVersion" and "apiSpecificResourceUriPart" are as defined in clause 7.5.1 and "custOpName" represents the name of the custom operation as defined in clause 5.1.3.2 of 3GPP TS 29.501 [5].

7.6 Notifications

The functional entities

- shall support the delivery of notifications using a separate HTTP connection towards an address;
- may support testing delivery of notifications; and
- may support the delivery of notification using WebSocket protocol (see IETF RFC 6455 [7]),

as described in 3GPP TS 29.122 [6], with the following clarifications:

- the SCEF is EES for Eees APIs; and
- the SCS/AS is the Subscriber entity invoking an EDGEAPP API.

7.7 Error handling

Response bodies for error handling, as described in clause 5.2.6 of 3GPP TS 29.122 [6], are applicable to all APIs in the present specification unless specified otherwise, with the following clarifications:

- the SCEF is EES for Eees APIs or ECS for Eecs APIs ; and
- the SCS/AS is the functional entity invoking an EDGEAPP API

7.8 Feature negotiation

The functional entity invoking an API (i.e. the EAS server) and the EDGEAPP server use feature negotiation procedures defined in clause 5.2.7 of 3GPP TS 29.122 [6] to negotiate the supported features, with the following clarifications:

- description of the SCEF applies to the EES for Eees APIs or ECS for Eecs APIs; and
- description of the SCS/AS applies to the functional entity invoking an EDGEAPP API.

7.9 HTTP headers

The HTTP headers described in 3GPP TS 29.122 [6] are applicable to all APIs in this document.

7.10 Conventions for Open API specification files

The conventions for Open API specification files as specified in clause 5.2.9 of 3GPP TS 29.122 [6] shall be applicable for all APIs in this document.

8 Edge Enabler Server API Definitions

8.1 Eees_EASRegistration API

8.1.1 Introduction

The Eees_EASRegistration service shall use the Eees_EASRegistration API.

The API URI of the Eees_EASRegistration API shall be:

{apiRoot}/<apiName>/<apiVersion>

The request URIs used in HTTP requests shall have the Resource URI structure as defined in clause 7.5, i.e.:

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

with the following components:

- The {apiRoot} shall be set as described in clause 7.5.
- The <apiName> shall be "ees-easregistration".
- The <apiVersion> shall be "v1".
- The <apiSpecificResourceUriPart> shall be set as described in clause 8.1.2.

8.1.2 Resources

8.1.2.1 Overview

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

Figure 8.1.2.1-1 depicts the resource URIs structure for the Eees_EASRegistration API.

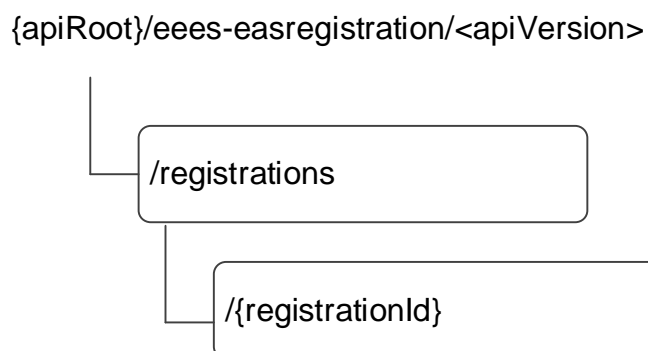


Figure 8.1.2.1-1: Resource URI structure of the Eees_EASRegistration API

Table 8.1.2.1-1 provides an overview of the resources and applicable HTTP methods.

Table 8.1.2.1-1: Resources and methods overview

Resource name	Resource URI	HTTP method or custom operation	Description
EAS Registrations	/registrations	POST	Registers a new EAS at the Edge Enabler Server.
Individual EAS Registration	/registrations/{registrationId}	GET	Fetch an individual EAS registration resource.
		PUT	Fully replace an individual EAS registration resource.
		DELETE	Remove an individual EAS registration resource.
		PATCH	Partially update an individual EAS registration resource.

8.1.2.2 Resource: EAS Registrations

8.1.2.2.1 Description

This resource represents all the Edge Application Servers that are registered at a given Edge Enabler Server.

8.1.2.2.2 Resource Definition

Resource URI: **{apiRoot}/eees-easregistration/<apiVersion>/registrations**

This resource shall support the resource URI variables defined in the table 8.1.2.2.2-1.

Table 8.1.2.2.2-1: Resource URI variables for this resource

Name	Data Type	Definition
apiRoot	string	See clause 7.5

8.1.2.2.3 Resource Standard Methods

8.1.2.2.3.1 POST

This method shall support the URI query parameters specified in table 8.1.2.2.3.1-1.

Table 8.1.2.2.3.1-1: URI query parameters supported by the POST method on this resource

Name	Data type	P	Cardinality	Description
n/a				

This method shall support the request data structures specified in table 8.1.2.2.3.1-2 and the response data structures and response codes specified in table 8.1.2.2.3.1-3.

Table 8.1.2.2.3.1-2: Data structures supported by the POST Request Body on this resource

Data type	P	Cardinality	Description
EASRegistration	M	1	EAS registration request information.

Table 8.1.2.2.3.1-3: Data structures supported by the POST Response Body on this resource

Data type	P	Cardinality	Response codes	Description
EASRegistration	M	1	201 Created	EAS information is registered successfully at EES. EAS information registered with EES is provided in the response body. The URI of the created resource shall be returned in the "Location" HTTP header.
NOTE: The mandatory HTTP error status code for the POST method listed in Table 5.2.6-1 of 3GPP TS 29.122 [6] also apply.				

Table 8.1.2.2.3.1-4: 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}/ees-easregistration/<apiVersion>/registrations/{registrationId}

8.1.2.2.4 Resource Custom Operations

None.

8.1.2.3 Resource: Individual EAS Registration

8.1.2.3.1 Description

This Individual EAS Registration resource represents an individual EAS registered at a given Edge Enabler Server.

8.1.2.3.2 Resource Definition

Resource URI: {apiRoot}/ees-easregistration/<apiVersion>/registrations/{registrationId}

This resource shall support the resource URI variables defined in the table 8.1.2.3.2-1.

Table 8.1.2.3.2-1: Resource URI variables for this resource

Name	Data Type	Definition
apiRoot	string	See clause 7.5
registrationId	string	The EAS registration identifier.

8.1.2.3.3 Resource Standard Methods

8.1.2.3.3.1 GET

This method retrieves the EAS information registered at Edge Enabler Server. This method shall support the URI query parameters specified in table 8.1.2.3.3.1-1.

Table 8.1.2.3.3.1-1: URI query parameters supported by the GET method on this resource

Name	Data type	P	Cardinality	Description
n/a				

This method shall support the request data structures specified in table 8.1.2.3.3.1-2 and the response data structures and response codes specified in table 8.1.2.3.3.1-3.

Table 8.1.2.3.3.1-2: Data structures supported by the GET Request Body on this resource

Data type	P	Cardinality	Description
n/a			

Table 8.1.2.3.3.1-3: Data structures supported by the GET Response Body on this resource

Data type	P	Cardinality	Response codes	Description
EASRegistration	M	1	200 OK	The EAS registration information at the Edge Enabler Server.
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 EES. Redirection handling is described in clause 5.2.10 of TS 29.122 [6].
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 EES. Redirection handling is described in clause 5.2.10 of TS 29.122 [6].
NOTE: The mandatory HTTP error status code for the GET method listed in Table 5.2.6-1 of 3GPP TS 29.122 [6] also apply.				

Table 8.1.2.3.3.1-4: Headers supported by the 307 Response Code on this resource

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

Table 8.1.2.3.3.1-5: Headers supported by the 308 Response Code on this resource

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

8.1.2.3.3.2 PUT

This method updates the EAS registration information at Edge Enabler Server by completely replacing the existing registration data (except the value of "suppFeat" attribute within the EASRegistration data type, and the value of "easId" attribute within the EASProfile data type). This method shall support the URI query parameters specified in the table 8.1.2.3.3.2-1.

Table 8.1.2.3.3.2-1: URI query parameters supported by the PUT method on this resource

Name	Data type	P	Cardinality	Description
n/a				

This method shall support the request data structures specified in table 8.1.2.3.3.2-2 and the response data structures and response codes specified in table 8.1.2.3.3.2-3.

Table 8.1.2.3.3.2-2: Data structures supported by the PUT Request Body on this resource

Data type	P	Cardinality	Description
EASRegistration	M	1	Details of the EAS registration information to be updated

Table 8.1.2.3.3.2-3: Data structures supported by the PUT Response Body on this resource

Data type	P	Cardinality	Response codes	Description
EASRegistration	M	1	200 OK	The EAS registration information updated successfully and the updated EAS registration information is returned in the response.
n/a			204 No Content	The EAS registration information was updated successfully.
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 EES. Redirection handling is described in clause 5.2.10 of TS 29.122 [6].
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 EES. Redirection handling is described in clause 5.2.10 of TS 29.122 [6].
NOTE: The mandatory HTTP error status code for the PUT method listed in Table 5.2.6-1 of 3GPP TS 29.122 [6] also apply.				

Table 8.1.2.3.3.2-4: Headers supported by the 307 Response Code on this resource

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

Table 8.1.2.3.3.2-5: Headers supported by the 308 Response Code on this resource

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

8.1.2.3.3.3 DELETE

This method deregisters an EAS registration from the EES. This method shall support the URI query parameters specified in the table 8.1.2.3.3.3-1.

Table 8.1.2.3.3.3-1: URI query parameters supported by the DELETE method on this resource

Name	Data type	P	Cardinality	Description
n/a				

This method shall support the request data structures specified in table 8.1.2.3.3.3-2 and the response data structures and response codes specified in table 8.1.2.3.3.3-3.

Table 8.1.2.3.3.3-2: Data structures supported by the DELETE Request Body on this resource

Data type	P	Cardinality	Description
n/a			

Table 8.1.2.3.3.3-3: Data structures supported by the DELETE Response Body on this resource

Data type	P	Cardinality	Response codes	Description
n/a			204 No Content	The individual EAS registration information matching the registrationId is 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 EES. Redirection handling is described in clause 5.2.10 of TS 29.122 [6].
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 EES. Redirection handling is described in clause 5.2.10 of TS 29.122 [6].
NOTE: The mandatory HTTP error status code for the DELETE method listed in Table 5.2.6-1 of 3GPP TS 29.122 [6] also apply.				

Table 8.1.2.3.3.3-4: Headers supported by the 307 Response Code on this resource

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

Table 8.1.2.3.3.3-5: Headers supported by the 308 Response Code on this resource

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

8.1.2.3.3.4 PATCH

This method partially updates the EAS registration information (except the easId) at Edge Enabler Server. This method shall support the URI query parameters specified in the table 8.1.2.3.3.4-1.

Table 8.1.2.3.3.4-1: URI query parameters supported by the PATCH method on this resource

Name	Data type	P	Cardinality	Description
n/a				

This method shall support the request data structures specified in table 8.1.2.3.3.4-2 and the response data structures and response codes specified in table 8.1.2.3.3.4-3.

Table 8.1.2.3.3.4-2: Data structures supported by the PATCH Request Body on this resource

Data type	P	Cardinality	Description
EASRegistrationPatch	M	1	Details of the EAS registration information to be updated

Table 8.1.2.3.3.4-3: Data structures supported by the PATCH Response Body on this resource

Data type	P	Cardinality	Response codes	Description
EASRegistration	M	1	200 OK	The Individual EAS registration information was updated successfully and the updated EAS registration information is returned in the response.
n/a			204 No Content	The Individual EAS registration information was updated successfully.
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 EES. Redirection handling is described in clause 5.2.10 of TS 29.122 [6].
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 EES. Redirection handling is described in clause 5.2.10 of TS 29.122 [6].
NOTE: The mandatory HTTP error status code for the PUT method listed in Table 5.2.6-1 of 3GPP TS 29.122 [6] also apply.				

Table 8.1.2.3.3.4-4: Headers supported by the 307 Response Code on this resource

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

Table 8.1.2.3.3.4-5: Headers supported by the 308 Response Code on this resource

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

8.1.2.3.4 Resource Custom Operations

None.

8.1.3 Custom Operations without associated resources

None.

8.1.4 Notifications

None.

8.1.5 Data Model

8.1.5.1 General

This clause specifies the application data model supported by the API. Data types listed in clause 7.2 apply to this API

Table 8.1.5.1-1 specifies the data types defined specifically for the Eees_EASRegistration API service.

Table 8.1.5.1-1: Eees_EASRegistration API specific Data Types

Data type	Section defined	Description	Applicability
Affinity	8.1.5.3.7	Represents the affinity requirements of an EAS bundle.	EdgeApp_2
BdlType	8.1.5.3.6	Represents the EAS bundle type.	EdgeApp_2
CoordinatedAcrReqs	8.1.5.2.10	Represents the coordinated ACR related requirements for an EAS bundle.	EdgeApp_2
EASBdlReqs	8.1.5.2.9	Represents EAS bundle requirements.	EdgeApp_2
EASBundleInfo	8.1.5.2.8	Represents EAS bundle information.	EdgeApp_2
EASCategory	8.1.5.3.4	Used to indicate the category or type of the EAS.	
EASProfile	8.1.5.2.3	The profile information related to the EAS in the EASRegistration data type.	
EASRegistration	8.1.5.2.2	The EAS registration information on EES.	
EASRegistrationPatch	8.1.5.2.6	To partially update the EAS Registration information.	
EASServiceKPI	8.1.5.2.4	Service characteristics provided by EAS, captured in EAS profile information.	
EndPoint	8.1.5.2.5	The end point information of the Edge Application Server in the EAS profile.	
FailureAction	8.1.5.3.8	Represents the EAS bundle related failure action during ACR.	EdgeApp_2
PermissionLevel	8.1.5.3.3	Used to indicate the level of service permissions supported by the EAS.	
TransContSuppDetails	8.1.5.2.7	Represents the detailed information about the EAS (e.g. SEALDD Server) capability for seamless transport layer service continuity.	SEALDDSupport
TransportProtocol	8.1.5.3.5	Indicates the supported transport layer protocol for EAS context transfer.	SEALDDSupport

Table 8.1.5.1-2 specifies data types re-used by the Eees_EASRegistration API service.

Table 8.1.5.1-2: Re-used Data Types

Data type	Reference	Comments	Applicability
SupportedFeatures	3GPP TS 29.571 [8]	Used to negotiate the applicability of optional features defined in table 8.1.7-1.	
DateTime	3GPP TS 29.122 [6]	Used to capture the expiration time of EAS registration.	
DateTimeRm	3GPP TS 29.571 [8]	Used to capture the expiration time EAS registration patch.	
ScheduledCommunicationTime	3GPP TS 29.122 [6]	Used to define the schedule of EAS availability.	
RouteToLocation	3GPP TS 29.571 [8]	Used to define the DNAs associated with EAS and the corresponding N6 routing information for each EAS DNAI.	
DurationSec	3GPP TS 29.122 [6]	Duration in seconds, used to define the availability reporting period for EES to check EAS availability.	
BitRate	3GPP TS 29.571 [8]	Used to express the connection bandwidth of EAS service KPI.	
Ipv4Addr	3GPP TS 29.122 [6]	Identifying the IPv4 address of the Edge Application Server.	
Ipv6Addr	3GPP TS 29.122 [6]	Identifying the IPv6 address of the Edge Application Server.	
PlmnlIdNid	3GPP TS 29.571 [8]	Represents the network identifier.	EdgeApp_2
ServiceArea	Clause 9.1.5.2.5	Represents the topological and geographical service area information of the EAS.	
UInteger	3GPP TS 29.571 [8]	Used to express the maximum response time of EAS service KPI.	
Fqdn	3GPP TS 29.571 [8]	Used to express the Fully Qualified Domain Name of EAS end point.	

8.1.5.2 Structured data types

8.1.5.2.1 Introduction

8.1.5.2.2 Type: EASRegistration

Table 8.1.5.2.2-1: Definition of type EASRegistration

Attribute name	Data type	P	Cardinality	Description	Applicability
easProf	EASProfile	M	1	The profile information of the EAS.	
expTime	DateTime	O	0..1	Identifies the expiration time for the EAS registration. If the expiration time is not present, then it indicates that the registration of EAS never expires.	
suppFeat	Supported Features	C	0..1	Used to negotiate the supported optional features of the API as described in clause 7.8. This attribute shall be provided in the HTTP POST request and in the response of successful resource creation.	

8.1.5.2.3 Type: EASProfile

Table 8.1.5.2.3-1: Definition of type EASProfile

Attribute name	Data type	P	Cardinality	Description	Applicability
easId	string	M	1	The application identifier of the EAS (e.g. URI, FQDN).	
endPt	EndPoint	M	1	Endpoint information (URI, FQDN, IP address) used to communicate with the EAS. This information may be discovered by EEC and exposed to ACs so that ACs can establish contact with the EAS.	
allowedPlmnId	PlmnIdNid	O	0..1	Contains the allowed PLMN ID from which the subscriber can consume the services of the EAS. (NOTE 4)	EdgeApp_2
easBdlInfos	array(EASBundleInfo)	O	1..N	Represents the list of EAS bundle(s) to which the EAS (identified by the "easId" attribute) belongs, and for each one of them, the corresponding EAS bundle information. (NOTE 3)	EdgeApp_2
acIds	array(string)	O	1..N	Identities of the Application Clients that can be served by the EAS	
provId	string	O	0..1	Identifier of the ASP that provides the EAS.	
type	EASCategory	O	0..1	The EAS type with the 3GPP standardized value set. (NOTE 1).	
flexEasType	string	O	0..1	The EAS type with the flexible value set. (NOTE 1)	
scheds	array(ScheduledCommunicationTime)	O	1..N	The availability schedule of the EAS.	
svcArea	ServiceArea	O	0..1	The list of geographical and topological areas that the EAS serves. ACs in the UE that are outside the area shall not be served.	
svckpi	EASServiceKPI	O	0..1	Service characteristics provided by the EAS.	
permLvl	array(PermissionLevel)	O	1..N	Level of service permissions supported by the EAS.	
easFeats	array(string)	O	1..N	Service specific features supported by the EAS (e.g. single vs multi-player gaming service).	
svcContSupp	array(ACRScenario)	O	1..N	The ACR scenarios supported by the EAS for service continuity. If this attribute is not present, then the EAS does not support service continuity.	
svcContSuppExt1	array(EASBundleInfo)	O	1..N	Represents the information related to the EAS ability to handle bundled EAS ACRs. This attribute may be present only when the "svcContSupp" attribute is also present. When this attribute is present, it indicates that the EAS (identified by the "easId" attribute) is able to handle bundled EAS ACRs and contains the information of the EAS bundle(s) for which the EAS is able to handle bundled EAS ACRs.	EdgeApp_2

transContSupp	TransContSuppDetails	O	0..1	Represents the detailed information about the EAS (e.g. SEALDD Server) capability for seamless transport layer service continuity. If this attribute is not present, then the EAS does not support the seamless transport layer service continuity capability.	SEALDDSupport
appLocs	array(RouteToLocation)	O	1..N	List of DNAI(s) and the corresponding N6 traffic routing information/routing profile ID, associated with the EAS. It is a subset of the DNAI(s) associated with the EDN where the EAS resides.	
avlRep	DurationSec	O	0..1	The period indicating to the EES, how often the EES needs to check the EAS's availability after a successful registration.	
status	string	O	0..1	EAS status (e.g. Enabled, Disabled etc.)	
genCtxDur	DurationSec	O	0..1	Contains the general context holding time duration, which indicates the time duration during which the EAS holds the application context in case of an ACR for service continuity planning.	EdgeApp_2
easSyncSupp	boolean	O	0..1	Indicates whether the EAS supports content synchronization between EASs. <ul style="list-style-type: none"> - When set to "true", it indicates that content synchronization between EASs is supported by the EAS. - When set to "false", it indicates that content synchronization between EASs is not supported by the EAS. - The default value when this attribute is omitted is "false". 	EdgeApp_2
<p>NOTE 1: The "flexEasType" attribute and the "type" attribute are mutually exclusive. Either one of them may be provided. The same attribute should be used when this data type is conveyed over the EDGE-1 and EDGE-3 interfaces (i.e. for the Eees_EASRegistration and the Eees_EASDiscovery APIs).</p> <p>NOTE 2: Void.</p> <p>NOTE 3: Within any instance of the EASBundleInfo data structure used to encode an array element of this attribute, the "easIdsList" attribute may be present only when the "bdId" attribute is also present and the "bdType" attribute is set to "PROXY".</p> <p>NOTE 4: In this release of the specification, this attribute shall include only the MNO information of the leading ECSP in case of edge node sharing scenario.</p>					

8.1.5.2.4 Type: EASServiceKPI

Table 8.1.5.2.4-1: Definition of type EASServiceKPI

Attribute name	Data type	P	Cardinality	Description	Applicability
maxReqRate	UInteger	O	0..1	Maximum request rate from the Application Client supported by the EAS. The minimum and maximum value shall be 0 and 100 respectively.	
maxRespTime	UInteger	O	0..1	The maximum response time, in the units of milliseconds, advertised for the AC's service requests. This includes the round trip time of the request and response packet, the processing time at the EAS and time required by EAS to consume any 3GPP core network capabilities.	
avail	UInteger	O	0..1	Advertised percentage of time the server is available for the AC's use. The minimum and maximum value shall be 0 and 100 respectively.	
avlComp	UInteger	O	0..1	The maximum compute resource available for the AC.	
avlGraComp	UInteger	O	0..1	The maximum graphical compute resource available for the AC.	
avlMem	UInteger	O	0..1	The maximum memory resource available for the AC.	
avlStrg	UInteger	O	0..1	The maximum storage resource available for the AC.	
connBand	BitRate	O	0..1	The connection bandwidth in Kbit/s advertised for the AC's use.	

8.1.5.2.5 Type: EndPoint

Table 8.1.5.2.5-1: Definition of type EndPoint

Attribute name	Data type	P	Cardinality	Description	Applicability
fqdn	Fqdn	C	0..1	Fully Qualified Domain Name of the Edge server. (NOTE)	
ipv4Addrs	array(Ipv4 Addr)	C	1..N	IPv4 addresses of the Edge server. (NOTE)	
ipv6Addrs	array(Ipv6 Addr)	C	1..N	IPv6 addresses of the Edge server. (NOTE)	
uri	Uri	C	0..1	URI information of the Edge server (NOTE)	

NOTE: One of the addressing parameters (fqdn, ipv4Addrs, ipv6Addrs, uri attributes) shall be included.

8.1.5.2.6 Type: EASRegistrationPatch

Table 8.1.5.2.6-1: Definition of type EASRegistrationPatch

Attribute name	Data type	P	Cardinality	Description	Applicability
easProf	EASProfile	O	0..1	The profile information of the EAS.	
expTime	DateTimeRm	O	0..1	Identifies the expiration time for the EAS registration. If the expiration time is not present, then it indicates that the registration of EAS never expires.	

8.1.5.2.7 Type: TransContSuppDetails

Table 8.1.5.2.7-1: Definition of type TransContSuppDetails

Attribute name	Data type	P	Cardinality	Description	Applicability
transProtocs	array(TransportProtocol)	M	1..N	Indicates the transport layer protocols supported for EAS (e.g. SEALDD Server) context transfer using the seamless transport layer service continuity capability.	

8.1.5.2.8 Type: EASBundleInfo

Table 8.1.5.2.8-1: Definition of type EASBundleInfo

Attribute name	Data type	P	Cardinality	Description	Applicability
bdlType	BdlType	M	1	Represents the EAS bundle type.	
bdlId	string	C	0..1	Contains the identifier of the EAS bundle. (NOTE)	
easIdsList	array(string)	C	1..N	Contains the list of the identifier(s) of the EAS(s) constituting the EAS bundle. (NOTE)	
easBdlReqs	EASBdlReqs	O	0..1	Contains the EAS Bundle Requirements.	
mainEasId	string	O	0..1	Represents the identifier of the EAS that plays the role of the main EAS within the EAS bundle.	

NOTE: At least one of these attributes shall be present.

8.1.5.2.9 Type: EASBdlReqs

Table 8.1.5.2.9-1: Definition of type EASBdlReqs

Attribute name	Data type	P	Cardinality	Description	Applicability
coordinatedEasDisc	boolean	O	0..1	Indicates whether or not coordinated EAS discovery is required (i.e., when the EAS discovery request for one of the EAS(s) of the bundle is processed, then the corresponding EAS discovery response should include information of all the EAS(s) of the bundle). <ul style="list-style-type: none"> - When set to "true", it indicates that coordinated EAS discovery is required. - When set to "false", it indicates that coordinated EAS discovery is not required. - The default value when this attribute is omitted is "false". 	
coordinatedAcr	CoordinatedAcrReqs	O	0..1	Represents the coordinated ACR requirements for the EAS bundle.	
affinity	Affinity	O	0..1	Represents the affinity requirements of the EAS bundle.	

8.1.5.2.10 Type: CoordinatedAcrReqs

Table 8.1.5.2.10-1: Definition of type CoordinatedAcrReqs

Attribute name	Data type	P	Cardinality	Description	Applicability
coordinatedAcrReq	boolean	M	1	Indicates whether or not coordinated ACR is required (i.e., when ACR is initiated for one of the EAS(s) of the bundle, then ACR should be initiated for all the other EAS(s) of the bundle). - When set to "true", it indicates that coordinated ACR is required. - When set to "false", it indicates that coordinated ACR is not required. - The default value when this attribute is omitted is "false".	
failureAction	FailureAction	O	0..1	Indicates the action to be taken when ACR for one or more EAS(s) of the EAS bundle fails, i.e., whether the ACR for all the other EAS(s) of the bundle shall proceed or be cancelled.	

8.1.5.3 Simple data types and enumerations

8.1.5.3.1 Introduction

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

8.1.5.3.2 Simple data types

The simple data types defined in table 8.1.5.3.2-1 shall be supported.

Table 8.1.5.3.2-1: Simple data types

Type Name	Type Definition	Description	Applicability

8.1.5.3.3 Enumeration: PermissionLevel

Table 8.1.5.3.3-1: Enumeration PermissionLevel

Enumeration value	Description	Applicability
TRIAL	Level of service permission supported is TRIAL.	
GOLD	Level of service permission supported is GOLD.	
SILVER	Level of service permission supported is SILVER.	
OTHER	Any other level of service permissions supported.	

8.1.5.3.4 Enumeration: EASCategory

Table 8.1.5.3.4-1: Enumeration EASCategory

Enumeration value	Description	Applicability
UAS	Indicates that the EAS category is for UAS services.	
V2X	Indicates that the EAS category is for V2X services.	
APP_ENABLER	Indicates that the EAS category is for Application Enabler (e.g., SEAL) services.	
OTHER	Indicates any other EAS category.	

8.1.5.3.5 Enumeration: TransportProtocol

Table 8.1.5.3.5-1: Enumeration TransportProtocol

Enumeration value	Description	Applicability
QUIC	Indicates the QUIC protocol.	
TCP	Indicate the Transmission Control Protocol.(TCP) protocol	
TCP_TLS	Indicates the Transmission Control Protocol (TCP) with Transport Layer Security (TLS) protocol.	

8.1.5.3.6 Enumeration: BdIType

Table 8.1.5.3.6-1: Enumeration BdIType

Enumeration value	Description	Applicability
DIRECT	Indicates that the EAS Bundle type is direct bundle. The AC interacts with multiple EASs of the EAS bundle directly (i.e., with no coordination between the EAS(s)).	
PROXY	Indicates that the EAS Bundle type is proxy bundle. The AC interacts with only one EAS of the EAS bundle, which in turn coordinates with the other EAS(s) of the EAS bundle to provide the services required by the AC.	

8.1.5.3.7 Enumeration: Affinity

Table 8.1.5.3.7-1: Enumeration Affinity

Enumeration value	Description	Applicability
STRONG	Indicates that the affinity is strong, i.e., all the EASs of the bundle shall be in the same EDN.	
PREFERRED	Indicates that the affinity is preferred, i.e., it is preferred to have all the EASs of the bundle in the same EDN, but it is not essential.	
WEAK	Indicates that the affinity is weak, i.e., it is not essential to have all the EASs of the bundle in the same EDN.	

8.1.5.3.8 Enumeration: FailureAction

Table 8.1.5.3.8-1: Enumeration FailureAction

Enumeration value	Description	Applicability
CANCEL	Indicates that ACR shall be cancelled for the other EAS(s) of the bundle for which ACR is not failed.	
PROCEED	Indicates that ACR shall proceed for the other EAS(s) of the bundle for which ACR is not failed.	

8.1.6 Error Handling

General error responses are defined in clause 7.7.

8.1.7 Feature negotiation

General feature negotiation procedures are defined in clause 7.8. Table 8.1.7-1 lists the supported features for Eees_EASRegistration API.

Table 8.1.7-1: Supported Features

Feature number	Feature Name	Description
1	SEALDDSupport	This feature indicates the support of the SEALDD functionality related enhancements. The following functionalities are supported: - Support the EAS capability for seamless transport layer service continuity within the EAS profile.
2	EdgeApp_2	This feature indicates the support of the enhancements to the Edge Applications. The following functionalities are supported: - Support of the indication of the general context holding time. - Support of the EAS bundle functionality. - Support of the indication of the EAS ability to handle bundled EAS ACRs within the EAS profile. - Support of allowed MNO information in the EAS Profile. - Support the provisioning of the indication on EAS support for content synchronization.

8.2 Eees_UELocation API

8.2.1 Introduction

The Eees_UELocation service shall use the Eees_UELocation API.

The API URI of the Eees_UELocation API shall be:

{apiRoot}/<apiName>/<apiVersion>

The request URIs used in HTTP requests shall have the Resource URI structure as defined in clause 7.5, i.e.:

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

with the following components:

- The {apiRoot} shall be set as described in clause 7.5.
- The <apiName> shall be "ees-uelocation".
- The <apiVersion> shall be "v1".

- The <apiSpecificResourceUriPart> shall be set as described in clause 8.2.2.

8.2.2 Resources

8.2.2.1 Overview

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

Figure 8.2.2.1-1 depicts the resource URIs structure for the Eees_UELocation API.

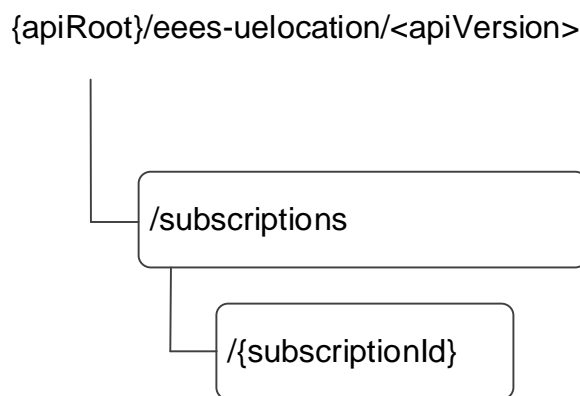


Figure 8.2.2.1-1: Resource URI structure of the Eees_UELocation API

Table 8.2.2.1-1 provides an overview of the resources and applicable HTTP methods.

Table 8.2.2.1-1: Resources and methods overview

Resource name	Resource URI	HTTP method or custom operation	Description
Location Information Subscriptions	/subscriptions	POST	Creates a subscription for continuous reporting of UE(s) location information to the EAS.
Individual Location Information Subscription	/subscriptions/{subscriptionId}	GET	Retrieves the Individual location information subscription information identified by subscriptionId.
		PATCH	Partially updates the Individual location information subscription identified by subscriptionId.
		PUT	Fully replace the Individual location information subscription identified by subscriptionId.
		DELETE	Removes the Individual location information subscription identified by subscriptionId.

8.2.2.2 Resource: Location Information Subscriptions

8.2.2.2.1 Description

This resource represents all location information subscriptions at a given EES.

8.2.2.2.2 Resource Definition

Resource URI: {apiRoot}/eees-uelocation/<apiVersion>/subscriptions

This resource shall support the resource URI variables defined in the table 8.2.2.2.2-1.

Table 8.2.2.2.2-1: Resource URI variables for this resource

Name	Data Type	Definition
apiRoot	string	See clause 7.5

8.2.2.2.3 Resource Standard Methods

8.2.2.2.3.1 POST

This method creates the location information subscription at the EES for continuous reporting of UE(s) location information. This method shall support the URI query parameters specified in the table 8.2.2.2.3.1-1.

Table 8.2.2.2.3.1-1: URI query parameters supported by the POST method on this resource

Name	Data type	P	Cardinality	Description
n/a				

This method shall support the request data structures specified in table 8.2.2.2.3.1-2 and the response data structures and response codes specified in table 8.2.2.2.3.1-3.

Table 8.2.2.2.3.1-2: Data structures supported by the POST Request Body on this resource

Data type	P	Cardinality	Description
LocationSubscription	M	1	Create a new location information subscription.

Table 8.2.2.2.3.1-3: Data structures supported by the POST Response Body on this resource

Data type	P	Cardinality	Response codes	Description
LocationSubscription	M	1	201 Created	The individual location information subscription resource created successfully. The information about the confirmed subscription at the EES is provided in the response body. The URI of the created resource shall be returned in the "Location" HTTP header.
ProblemDetails	O	0..1	403 Forbidden	(NOTE 2)
NOTE 1: The mandatory HTTP error status code for the POST method listed in Table 5.2.6-1 of 3GPP TS 29.122 [6] also apply.				
NOTE 2: Failure cases are described in clause 8.2.6.3.				

Table 8.2.2.2.3.1-4: 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}/eees-uelocation/<apiVersion>/subscriptions/{subscriptionId}

8.2.2.2.4 Resource Custom Operations

None.

8.2.2.3 Resource: Individual Location Information Subscription

8.2.2.3.1 Description

This resource represents the individual location information subscription of an EAS at a given EES.

8.2.2.3.2 Resource Definition

Resource URI: {apiRoot}/eees-uelocation/<apiVersion>/subscriptions/{subscriptionId}

This resource shall support the resource URI variables defined in the table 8.2.2.3.2-1.

Table 8.2.2.3.2-1: Resource URI variables for this resource

Name	Data Type	Definition
apiRoot	string	See clause 7.5
subscriptionId	string	Identifies an individual location information subscription.

8.2.2.3.3 Resource Standard Methods

8.2.2.3.3.1 GET

This method retrieves the location information subscription information at EES. This method shall support the URI query parameters specified in the table 8.2.2.3.3.1-1.

Table 8.2.2.3.3.1-1: URI query parameters supported by the GET method on this resource

Name	Data type	P	Cardinality	Description
n/a				

This method shall support the request data structures specified in table 8.2.2.3.3.1-2 and the response data structures and response codes specified in table 8.2.2.3.3.1-3.

Table 8.2.2.3.3.1-2: Data structures supported by the GET Request Body on this resource

Data type	P	Cardinality	Description
n/a			

Table 8.2.2.3.3.1-3: Data structures supported by the GET Response Body on this resource

Data type	P	Cardinality	Response codes	Description
LocationSubscription	M	1	200 OK	The location information subscription information is returned by the EES.
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 EES. Redirection handling is described in clause 5.2.10 of TS 29.122 [6].
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 EES. Redirection handling is described in clause 5.2.10 of TS 29.122 [6].
NOTE: The mandatory HTTP error status code for the GET method listed in Table 5.2.6-1 of 3GPP TS 29.122 [6] also apply.				

Table 8.2.2.3.3.1-4: Headers supported by the 307 Response Code on this resource

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

Table 8.2.2.3.3.1-5: Headers supported by the 308 Response Code on this resource

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

8.2.2.3.3.2 PATCH

This method partially updates the location information subscription information at the EES. This method shall support the URI query parameters specified in the table 8.2.2.3.3.2-1.

Table 8.2.2.3.3.2-1: URI query parameters supported by the PATCH method on this resource

Name	Data type	P	Cardinality	Description
n/a				

This method shall support the request data structures specified in table 8.2.2.3.3.2-2 and the response data structures and response codes specified in table 8.2.2.3.3.2-3.

Table 8.2.2.3.3.2-2: Data structures supported by the PATCH Request Body on this resource

Data type	P	Cardinality	Description
LocationSubscriptionPatch	M	1	Request to partially update the individual location information subscription matching the subscriptionId at the EES.

Table 8.2.2.3.3.2-3: Data structures supported by the PATCH Response Body on this resource

Data type	P	Cardinality	Response codes	Description
LocationSubscription	M	1	200 OK	The individual Location information subscription matching the subscriptionId was modified successfully and the updated Location subscription information is returned in the response.
n/a			204 No Content	The individual Location information subscription matching the subscriptionId was modified successfully.
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 EES. Redirection handling is described in clause 5.2.10 of TS 29.122 [6].
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 EES. Redirection handling is described in clause 5.2.10 of TS 29.122 [6].
ProblemDetails	O	0..1	403 Forbidden	(NOTE 2)
NOTE 1: The mandatory HTTP error status code for the PATCH method listed in Table 5.2.6-1 of 3GPP TS 29.122 [6] also apply.				
NOTE 2: Failure cases are described in clause 8.2.6.3.				

Table 8.2.2.3.3.2-4: Headers supported by the 307 Response Code on this resource

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

Table 8.2.2.3.3.2-5: Headers supported by the 308 Response Code on this resource

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

8.2.2.3.3.3 PUT

This method updates the location information subscription information at the EES by completely replacing the existing subscription data (except easId, ueId, groupId). This method shall support the URI query parameters specified in the table 8.2.2.3.3.3-1.

Table 8.2.2.3.3.3-1: URI query parameters supported by the PUT method on this resource

Name	Data type	P	Cardinality	Description
n/a				

This method shall support the request data structures specified in table 8.2.2.3.3.3-2 and the response data structures and response codes specified in table 8.2.2.3.3.3-3.

Table 8.2.2.3.3.3-2: Data structures supported by the PUT Request Body on this resource

Data type	P	Cardinality	Description
LocationSubscription	M	1	Details of individual location information subscription matching the subscriptionId to be updated at the EES.

Table 8.2.2.3.3.3-3: Data structures supported by the PUT Response Body on this resource

Data type	P	Cardinality	Response codes	Description
LocationSubscription	M	1	200 OK	The individual Location information subscription matching the subscriptionId was modified successfully and the updated Location subscription information is returned in the response.
n/a			204 No Content	The individual Location information subscription matching the subscriptionId was modified successfully.
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 EES. Redirection handling is described in clause 5.2.10 of TS 29.122 [6].
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 EES. Redirection handling is described in clause 5.2.10 of TS 29.122 [6].
ProblemDetails	O	0..1	403 Forbidden	(NOTE 2)
NOTE 1: The mandatory HTTP error status code for the PUT method listed in Table 5.2.6-1 of 3GPP TS 29.122 [6] also apply.				
NOTE 2: Failure cases are described in clause 8.2.6.3.				

Table 8.2.2.3.3.3-4: Headers supported by the 307 Response Code on this resource

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

Table 8.2.2.3.3.3-5: Headers supported by the 308 Response Code on this resource

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

8.2.2.3.3.4 DELETE

This method removes the location information subscription information from the EES. This method shall support the URI query parameters specified in the table 8.2.2.3.3.4-1.

Table 8.2.2.3.3.4-1: URI query parameters supported by the DELETE method on this resource

Name	Data type	P	Cardinality	Description
n/a				

This method shall support the request data structures specified in table 8.2.2.3.3.4-2 and the response data structures and response codes specified in table 8.2.2.3.3.4-3.

Table 8.2.2.3.3.4-2: Data structures supported by the DELETE Request Body on this resource

Data type	P	Cardinality	Description
n/a			

Table 8.2.2.3.3.4-3: Data structures supported by the DELETE Response Body on this resource

Data type	P	Cardinality	Response codes	Description
n/a			204 No Content	The individual Location information subscription matching the subscriptionId is 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 EES. Redirection handling is described in clause 5.2.10 of TS 29.122 [6].
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 EES. Redirection handling is described in clause 5.2.10 of TS 29.122 [6].
NOTE: The mandatory HTTP error status code for the DELETE method listed in Table 5.2.6-1 of 3GPP TS 29.122 [6] also apply.				

Table 8.2.2.3.3.4-4: Headers supported by the 307 Response Code on this resource

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

Table 8.2.2.3.3.4-5: Headers supported by the 308 Response Code on this resource

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

8.2.2.3.4 Resource Custom Operations

None.

8.2.3 Custom Operations without associated resources

8.2.3.1 Overview

The structure of the custom operation URIs of the Eees_UELocation API is shown in Figure 8.2.3.1-1.

{apiRoot}/ees-uelocation/<apiVersion>

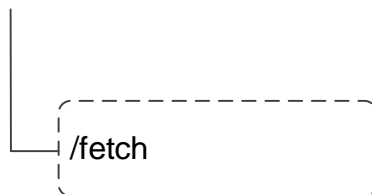


Figure 8.2.3.1-1: Custom operation URI structure of the Eees_UELocation API

Custom operations used for this API are summarized in table 8.2.3.1-1.

Table 8.2.3.1-1: Custom operations without associated resources

Operation name	Custom operation URI	Mapped HTTP method	Description
Fetch	/fetch	POST	Fetch an UE location information.

8.2.3.2 Operation: Fetch

8.2.3.2.1 Description

This custom operation allows the EAS to fetch an UE's location information from the EES.

8.2.3.2.2 Operation Definition

This operation shall support the request data structures and response codes and data structures specified in tables 8.2.3.2.2-1 and 8.2.3.2.2-2.

Table 8.2.3.2.2-1: Data structures supported by the POST Request Body on this resource

Data type	P	Cardinality	Description
LocationRequest	M	1	Parameters to request to fetch the UE location information.

Table 8.2.3.2.2-2: Data structures supported by the POST Response Body on this resource

Data type	P	Cardinality	Response codes	Description
LocationResponse	M	1	200 OK	Upon success, the UE location information returned by the EES.
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 EES. Redirection handling is described in clause 5.2.10 of TS 29.122 [6].
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 EES. Redirection handling is described in clause 5.2.10 of TS 29.122 [6].
ProblemDetails	O	0..1	403 Forbidden	(NOTE 2)
NOTE 1: The mandatory HTTP error status code for the POST method listed in the Table 5.2.6-1 of 3GPP TS 29.122 [6] also apply.				
NOTE 2: Failure cases are described in clause 8.2.6.3.				

Table 8.2.3.2.2-3: Headers supported by the 307 Response Code on this resource

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

Table 8.2.3.2.2-4: Headers supported by the 308 Response Code on this resource

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

8.2.4 Notifications

8.2.4.1 General

Table 8.2.4.1-1: Notifications overview

Notification	Callback URI	HTTP method or custom operation	Description (service operation)
Location Information Notification	{notificationDestination}	POST	Notifies the subscriber EAS the UE(s) location information.
User Consent Revocation Notification	{revocationNotifUri}	POST	The user consent revocation notification from the EES to the EAS to inform about the revocation of user consent for one or several UE(s).

8.2.4.2 Location Information Notification

8.2.4.2.1 Description

Location Information Notification is used by the EES to notify an EAS with location information of UE(s). The EES shall subscribe to the location information for UE(s) via the Individual Location Information Subscription resource.

8.2.4.2.2 Target URI

The callback URI **{notificationDestination}** shall be used with the callback URI variables defined in table 8.2.4.2.2-1.

Table 8.2.4.2.2-1: Callback URI variables

Name	Data type	Definition
notificationDestination	Uri	Callback reference provided by the EAS during the UE location information subscription creation/update/modification procedure.

8.2.4.2.3 Standard Methods

8.2.4.2.3.1 POST

This method shall support the request data structures specified in table 8.2.4.2.3.1-1 and the response data structures and response codes specified in table 8.2.4.2.3.1-2.

Table 8.2.4.2.3.1-1: Data structures supported by the POST Request Body on this resource

Data type	P	Cardinality	Description
LocationNotification	M	1	Notification of UE(s) location information.

Table 8.2.4.2.3.1-2: Data structures supported by the POST Response Body on this resource

Data type	P	Cardinality	Response codes	Description
n/a			204 No Content	The receipt of the Notification is 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 EAS where the notification should be sent. Redirection handling is described in clause 5.2.10 of TS 29.122 [6].
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 EAS where the notification should be sent. Redirection handling is described in clause 5.2.10 of TS 29.122 [6].
NOTE: The mandatory HTTP error status code for the POST method listed in Table 5.2.6-1 of 3GPP TS 29.122 [6] also apply.				

Table 8.2.4.2.3.1-3: Headers supported by the 307 Response Code on this resource

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

Table 8.2.4.2.3.1-4: Headers supported by the 308 Response Code on this resource

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

8.2.4.3 User Consent Revocation Notification

8.2.4.3.1 Description

The User Consent Revocation Notification is used by the EES to report the revocation of user consent for one or several UE(s) to the EAS.

8.2.4.3.2 Target URI

The Callback URI "{revocationNotifUri}" shall be used with the callback URI variables defined in table 8.2.4.3.2-1.

Table 8.2.4.3.2-1: Callback URI variables

Name	Data type	Definition
revocationNotifUri	Uri	Callback reference provided by the EAS during the UE location information subscription creation or modification procedure if the UserConsentRevocation feature is supported, within the LocationSubscription data structure as specified in clauses 8.2.2.2.3.1, 8.2.2.3.3.3 and 8.2.5.2.2, or the LocationSubscriptionPatch data structure as specified in clauses 8.2.2.3.3.2, and 8.2.5.2.3.

8.2.4.3.3 Standard Methods

8.2.4.3.3.1 POST

This method shall support the request data structures specified in table 8.2.4.3.3.1-1 and the response data structures and response codes specified in table 8.2.4.3.3.1-2.

Table 8.2.4.3.3.1-1: Data structures supported by the POST Request Body on this resource

Data type	P	Cardinality	Description
ConsentRevocNotif	M	1	Contains the user consent revocation information.

8.2.4.3.3.1-2: Data structures supported by the POST Response Body on this resource

Data type	P	Cardinality	Response codes	Description
n/a			204 No Content	Successful case. The user consent revocation notification is successfully received.
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 EAS where the notification should be sent. Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [6].
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 EAS where the notification should be sent. Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [6].
NOTE: The mandatory HTTP error status code for the HTTP POST method listed in Table 5.2.6-1 of TS 29.122 [6] also apply.				

Table 8.2.4.3.3.1-3: Headers supported by the 307 Response Code on this resource

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

Table 8.2.4.3.3.1-4: Headers supported by the 308 Response Code on this resource

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

8.2.5 Data Model

8.2.5.1 General

This clause specifies the application data model supported by the API. Data types listed in clause 7.2 apply to this API

Table 8.2.5.1-1 specifies the data types defined specifically for the Eees_UELocation API service.

Table 8.2.5.1-1: Eees_UELocation API specific Data Types

Data type	Section defined	Description	Applicability
ConsentRevoked	8.2.5.2.9	Represents the information related to revoked user consent(s).	UserConsentRevocation
ConsentRevocNotif	8.2.5.2.8	Represents the user consent revocation information conveyed in a user consent revocation notification.	UserConsentRevocation
LocationSubscription	8.2.5.2.2	Represents the location information subscription.	
LocationSubscriptionPatch	8.2.5.2.3	Used to request the partial update of location information subscription.	
LocationNotification	8.2.5.2.4	UE location information notification from EES to EAS.	
LocationEvent	8.2.5.2.5	Location information related an Individual UE.	
LocationRequest	8.2.5.2.6	UE location information request	
LocationResponse	8.2.5.2.7	Contains the response to a UE location information retrieval request.	

Table 8.2.5.1-2 specifies data types re-used by the Eees_UELocation API service.

Table 8.2.5.1-2: Re-used Data Types

Data type	Reference	Comments	Applicability
Gpsi	3GPP TS 29.571 [8]	Used to identify the UE in the query parameter, for which location information is queried.	
LocationQoS	3GPP TS 29.572 [11]	Used to indicate the location quality of service, of the location information queried.	
LocationInfo	3GPP TS 29.122 [6]	The location information related to the UE .	
DateTime	3GPP TS 29.122 [6]	Used to capture the expiration time of EAS subscription for location information reporting.	
ReportingInformation	3GPP TS 29.523 [13]	Used to indicate the reporting requirement, only the following information are applicable: - immRep - notifMethod - maxReportNbr - monDur - repPeriod	
SupportedFeatures	3GPP TS 29.571 [8]	Used to negotiate the applicability of optional features.	
TestNotification	3GPP TS 29.122 [6]	Following differences apply: - The SCEF is the EES; and - The SCS/AS is the subscribing EAS.	
UcPurpose	3GPP TS 29.503 [22]	Represents the purpose of a user consent.	UserConsentRevocation
Uri	3GPP TS 29.122 [6]		
WebsocketNotifConfig	3GPP TS 29.122 [6]	Following differences apply: - The SCEF is the EES; and - The SCS/AS is the subscribing EAS.	
UeMobilityExposure	3GPP TS 29.522 [10]	The predictive location information related to the UE,	
Groupld	3GPP TS 29.571 [8]	Used to present the internal group identifier in location subscription.	
Externalld	TS 29.122 [6]	Represents an external identifier.	
ExternalGroupld	3GPP TS 29.571 [8]	Used to present the external group identifier in location subscription.	
Accuracy	3GPP TS 29.122 [6]	Used by EAS to indicate the desired granularity of the requested location information.	

8.2.5.2 Structured data types

8.2.5.2.1 Introduction

8.2.5.2.2 Type: LocationSubscription

Table 8.2.5.2.2-1: Definition of type LocationSubscription

Attribute name	Data type	P	Cardinality	Description	Applicability
easId	string	M	1	The application identifier of the EAS (e.g. URI, FQDN) subscribing for location information report.	
ueId	Gpsi	O	0..1	Identifier of the UE for which the location information reporting is subscribed for. (NOTE)	
intGrpId	GroupId	O	0..1	The internal group identifier, identifying the group of UEs for which the location information reporting is subscribed for. (NOTE)	
extGrpId	ExternalGroupId	O	0..1	The external group identifier, identifying the group of UEs for which the location information reporting is subscribed for. (NOTE)	
expTime	DateTime	O	0..1	Indicates the expiration time of the subscription. If the expiration time is not present, then it indicates that the EAS subscription never expires.	
locGran	Accuracy	O	0..1	Indicates the format of the location information that the EAS supports. EAS wishes to receive the location information report from the EES in the indicated format.	
locQos	LocationQoS	O	0..1	Indicates the location QoS as specified in 3GPP TS 29.572 [11].	
eventReq	ReportingInformation	O	0..1	Represents the reporting requirements of the location information event subscription.	
notificationDestination	Uri	C	0..1	URI where the location information notification should be delivered to. This attribute shall be present in HTTP POST message to EES and shall be present in HTTP PUT request.	
revocationNotificationUri	Uri	C	0..1	Contains the URI via which the EAS desires to receive user consent revocation notifications. If the "UserConsentRevocation" feature is supported by the EAS, this attribute shall be present in an HTTP POST request/response, and HTTP PUT request/response, and HTTP PATCH responses, and may be present in an HTTP PATCH request, if the revocation notification needs to be updated.	UserConsentRevocation
requestTestNotification	boolean	O	0..1	Set to true by Subscriber to request the EES to send a test notification as defined in clause 7.6. Set to false or omitted otherwise.	Notification_test_event
websocketNotificationConfig	WebsocketNotificationConfig	O	0..1	Configuration parameters to set up notification delivery over Websocket protocol as defined in clause 7.6.	Notification_websocket
supportedFeatures	SupportedFeatures	C	0..1	Used to negotiate the supported optional features of the API as described in clause 7.8. This attribute shall be provided in the HTTP POST request to create a new subscription resource, if at least one feature is supported, and in the HTTP POST response of successful resource creation, if it was present in the associated HTTP POST request.	
NOTE: Only one of UE Identifier (ueId), Internal group identifier (intGrpId), and External group identifier (extGrpId) shall be included.					

NOTE: To protect the privacy of the user, the MSISDN can be used as GPSI only after obtaining user's consent.

8.2.5.2.3 Type: LocationSubscriptionPatch

Table 8.2.5.2.3-1: Definition of type LocationSubscriptionPatch

Attribute name	Data type	P	Cardinality	Description	Applicability
eventReq	ReportingInformation	O	0..1	The reporting requirements of the location information event subscription to be updated.	
expTime	DateTime	O	0..1	Indicates the proposed expiration time of the subscription.	
notificationDestination	Uri	O	0..1	Updated URI where the location information notification should be delivered to.	
revocationNotifUri	Uri	O	0..1	Contains the updated URI via which the EAS desires to receive user consent revocation notifications. This attribute may be present if the "UserConsentRevocation" feature is supported by the EAS.	UserConsentRevocation
locGran	Accuracy	O	0..1	Updated format of the location information that the EAS supports.	
locQos	LocationQoS	O	0..1	Updated location QoS, as specified in 3GPP TS 29.572 [11].	

8.2.5.2.4 Type: LocationNotification

Table 8.2.5.2.4-1: Definition of type LocationNotification

Attribute name	Data type	P	Cardinality	Description	Applicability
subId	string	M	1	String identifying the individual Location information subscription for which the location notification is delivered.	
locEvs	array(LocationEvent)	M	1..N	List of notifications that include the location information of the UE(s).	

8.2.5.2.5 Type: LocationEvent

Table 8.2.5.2.5-1: Definition of type LocationEvent

Attribute name	Data type	P	Cardinality	Description	Applicability
ueld	Gpsi	M	1	Identifier of the UE for which the location information is reported.	
locInf	LocationInfo	C	0..1	Actual Location information of the UE. (NOTE)	
locInfPred	UeMobilityExposure	C	0..1	Predictive location information of the UE. (NOTE)	
NOTE: Only one of "locInf" or "locInfPred" shall be included.					

8.2.5.2.6 Type: LocationRequest

Table 8.2.5.2.6-1: Definition of type LocationRequest

Attribute name	Data type	P	Cardinality	Description	Applicability
ueId	Gpsi	M	1	Identifier of the UE for which the location information is requested.	
gran	Accuracy	O	0..1	Format in which the location information is requested by the EAS.	
locQos	LocationQoS	O	0..1	Indicates the location quality of service of the requested location information.	
suppFeat	Supported Features	C	0..1	Used to negotiate the supported optional features of the API as described in clause 7.8. This attribute shall be provided in the HTTP POST request to retrieve UE location information, if at least one feature is supported.	

8.2.5.2.7 Type: LocationResponse

Table 8.2.5.2.7-1: Definition of type LocationResponse

Attribute name	Data type	P	Cardinality	Description	Applicability
ueLocation	LocationInfo	M	1	Contains the requested UE location information.	
suppFeat	Supported Features	C	0..1	Used to negotiate the supported optional features of the API as described in clause 7.8. This attribute shall be provided in the HTTP POST response for UE location information retrieval, if it was present in the associated HTTP POST request.	

8.2.5.2.8 Type: ConsentRevocNotif

Table 8.2.5.2.8-1: Definition of type ConsentRevocNotif

Attribute name	Data type	P	Cardinality	Description	Applicability
subscriptionId	string	M	1	Contains the identifier of the subscription to which the notification is related.	
consentsRevoked	array(ConsentRevoked)	M	1..N	Indicates the revoked user consents.	

8.2.5.2.9 Type: ConsentRevoked

Table 8.2.5.2.9-1: Definition of type ConsentRevoked

Attribute name	Data type	P	Cardinality	Description	Applicability
ucPurpose	UcPurpose	M	1	Identifies the purpose of the revoked user consent.	
ueld	Gpsi	C	0..1	Contains the identifier of the UE for which user consent was revoked. (NOTE)	
externalId	ExternalId	C	0..1	Indicates the user for which user consent was revoked. (NOTE)	
NOTE: One of the "ueld" or "externalId" attributes shall be present.					

8.2.5.3 Simple data types and enumerations

None.

8.2.6 Error Handling

8.2.6.1 General

For the Eees_UELocation API, HTTP error handling shall be supported as specified in clause 7.7. In addition, the requirements in the following clauses are applicable for the Eees_UELocation API.

8.2.6.2 Protocol Errors

No specific protocol errors for the Eees_UELocation API are specified.

8.2.6.3 Application Errors

The application errors defined for the Eees_UELocation API are listed in Table 8.2.6.3-1.

Table 8.2.6.3-1: Application errors

Application Error	HTTP status code	Description
CONSENT_REVOCATION_NOT_SUPPORTED	403 Forbidden	Indicates that the request is rejected because user consent management and enforcement is not supported by the client.
USER_CONSENT_NOT_GRANTED	403 Forbidden	Indicates that the request is rejected because user consent is not granted.

8.2.7 Feature negotiation

General feature negotiation procedures are defined in clause 7.8. Table 8.2.7-1 lists the supported features for Eees_UELocation API.

Table 8.2.7-1: Supported Features

Feature number	Feature Name	Description
1	Notification_test_event	Testing of notification connection is supported according to clause 7.6.
2	Notification_websocket	The delivery of notifications over Websocket is supported according to clause 7.6. This feature requires that the Notification_test_event feature is also supported.
3	UserConsentRevocation	This feature indicates the support of user consent revocation management and enforcement (e.g. stop data processing).
4	enNB1	This feature indicates the support of enhancements to this application layer API in Rel-18.

8.3 Eees_UIIdentifier API

8.3.1 Introduction

The Eees_UIIdentifier service shall use the Eees_UIIdentifier API.

The API URI of the Eees_UIIdentifier API shall be:

{apiRoot}/<apiName>/<apiVersion>

The request URIs used in HTTP requests shall have the Resource URI structure as defined in clause 7.5, i.e.:

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

with the following components:

- The {apiRoot} shall be set as described in clause 7.5.
- The <apiName> shall be "ees-ueidentifier".
- The <apiVersion> shall be "v1".
- The <apiSpecificResourceUriPart> shall be set as described in clause 8.3.2.

8.3.2 Resources

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

8.3.3 Custom Operations without associated resources

8.3.3.1 Overview

The structure of the custom operation URIs of the Eees_UIIdentifier API is shown in Figure 8.3.3.1-1.

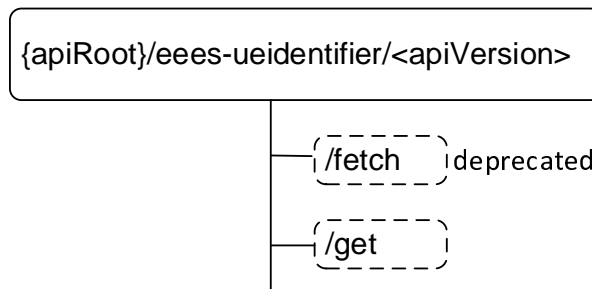


Figure 8.3.3.1-1: Custom operation URI structure of the Eees_UEIdentifier API

Table 8.3.3.1-1 provides an overview of the custom operations and applicable HTTP methods defined for the Eees_UEIdentifier API.

Table 8.3.3.1-1: Custom operations without associated resources

Operation name	Custom operation URI	Mapped HTTP method	Description
Fetch	/fetch	POST	Fetch the identifier of a UE. This custom operation is deprecated. The "Get" operation should be used instead.
Get	/get	POST	EAS fetch the UE Identifier information.

NOTE 1: Based on SA3 specified security mechanisms for EDGE-1 and EDGE-3 interfaces, the EES can identify the initiator of the API (EEC or EAS) and apply the appropriate security procedures as specified in 3GPP TS 33.558 [20].

NOTE 2: The same service API can be implemented on two different interfaces, i.e. EDGE-1 and EDGE-3, which are for separate endpoints, i.e. the EEC and the EAS.

8.3.3.2 Operation: Fetch

This operation is deprecated. The operation defined in clause 8.3.3.3 should be used instead.

8.3.3.2.1 Description

This custom operation allows the EAS to fetch a UE's identifier, which is UE ID as specified in 3GPP TS 23.558 [2], from the EES for a given UE information.

8.3.3.2.2 Operation Definition

This operation shall support the request data structures and the response data structure and response codes specified in the tables 8.3.3.2.2-1 and 8.3.3.2.2-2.

Table 8.3.3.2.2-1: Data structures supported by the POST Request Body on this resource

Data type	P	Cardinality	Description
UserInformation	M	1	Information about the User or the UE, available at the EAS.

Table 8.3.3.2.2-2: Data structures supported by the POST Response Body on this resource

Data type	P	Cardinality	Response codes	Description
Gpsi	M	1	200 OK	The UE Identifier (UE ID), returned by the Edge Enabler Server.
n/a			307 Temporary Redirect	Temporary redirection. The response shall include a Location header field containing an alternative target URI located in an alternative EES. Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [6].
n/a			308 Permanent Redirect	Permanent redirection. The response shall include a Location header field containing an alternative target URI located in an alternative EES. Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [6].
NOTE: The mandatory HTTP error status code for the POST method listed in Table 5.2.6-1 of 3GPP TS 29.122 [6] also apply.				

Table 8.3.3.2.2-3: Headers supported by the 307 Response Code on this resource

Name	Data type	P	Cardinality	Description
Location	string	M	1	An alternative target URI located in an alternative EES.

Table 8.3.3.2.2-4: Headers supported by the 308 Response Code on this resource

Name	Data type	P	Cardinality	Description
Location	string	M	1	An alternative target URI located in an alternative EES.

8.3.3.3 Operation: Get

8.3.3.3.1 Description

This custom operation allows the service consumer to retrieve UE Identifier information from the EES for a given User information as specified in 3GPP TS 23.558 [2].

8.3.3.3.2 Operation Definition

This operation shall support the request data structures and the response data structure and response codes specified in the tables 8.3.3.3.2-1 and 8.3.3.3.2-2.

Table 8.3.3.3.2-1: Data structures supported by the POST Request Body on this resource

Data type	P	Cardinality	Description
UserInfo	M	1	Information about the User or the UE, provided by the service consumer.

Table 8.3.3.3.2-2: Data structures supported by the POST Response Body on this resource

Data type	P	Cardinality	Response codes	Description
UeldInfo	M	1	200 OK	The operation is successful and the corresponding UE Identifier information, returned by the Edge Enabler Server is included in the response body.
n/a			307 Temporary Redirect	Temporary redirection. The response shall include a Location header field containing an alternative target URI located in an alternative EES. Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [6].
n/a			308 Permanent Redirect	Permanent redirection. The response shall include a Location header field containing an alternative target URI located in an alternative EES. Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [6].

NOTE: The mandatory HTTP error status code for the POST method listed in Table 5.2.6-1 of 3GPP TS 29.122 [6] also apply.

Table 8.3.3.3.2-3: Headers supported by the 307 Response Code on this resource

Name	Data type	P	Cardinality	Description
Location	string	M	1	An alternative target URI located in an alternative EES.

Table 8.3.3.3.2-4: Headers supported by the 308 Response Code on this resource

Name	Data type	P	Cardinality	Description
Location	string	M	1	An alternative target URI located in an alternative EES.

8.3.4 Notifications

None.

8.3.5 Data Model

8.3.5.1 General

This clause specifies the application data model supported by the API. Data types listed in clause 7.2 apply to this API

Table 8.3.5.1-1 specifies the data types defined specifically for the Eees_UEIdentifier API service.

Table 8.3.5.1-1: Eees_UEIdentifier API specific Data Types

Data type	Section defined	Description	Applicability
UserInformation	8.3.5.2.2	Information about the User or the UE, that used by EES to use 3GPP CN capability to retrieve the EAS specific UE identifier. Deprecated.	
UserInfo	8.3.5.2.3	Information about the User or the UE, that used by EES to retrieve the UE identifier Information.	
UeldInfo	8.3.5.2.4	UE Identifier Information, including list of UE Identifier related information.	
Ueld	8.3.5.2.5	UE identifier.	
UeldType	8.3.5.3.3	Identifies the UE Identifier type.	

Table 8.3.5.1-2 specifies data types re-used by the Eees_UEIdentifier API service.

Table 8.3.5.1-2: Re-used Data Types

Data type	Reference	Comments	Applicability
Gpsi	3GPP TS 29.571 [8]	Used to identify the UE with GPSI.	
IpAddr	3GPP TS 29.571 [8]	IP address of the UE.	
Port	3GPP TS 29.122 [6]	Identifies a port, unsigned integer with valid values between 0 and 65535.	
SupportedFeatures	3GPP TS 29.571 [8]	Used to negotiate the applicability of optional features defined in table 8.3.7-1.	

8.3.5.2 Structured data types

8.3.5.2.1 Introduction

8.3.5.2.2 Type: UserInformation

This data type is deprecated.

Table 8.3.5.2.2-1: Definition of type UserInformation

Attribute name	Data type	P	Cardinality	Description	Applicability
easId	string	M	1	The application identifier of the EAS (e.g. URI, FQDN) requesting the UE Identifier information.	
easProviderId	string	O	0..1	Identifier of the ASP that provides the EAS.	
ipAddr	IpAddr	M	1	IP address of the UE.	
supFeat	Supported Features	C	0..1	Used to negotiate the supported optional features of the API as described in clause 7.8. This attribute shall be provided in the HTTP POST request and success response.	

8.3.5.2.3 Type: UserInfo

Table 8.3.5.2.3-1: Definition of type UserInfo

Attribute name	Data type	P	Cardinality	Description	Applicability
easIds	array(string)	C	1..N	The list of EAS Identifiers for which the UE IDs are requested by the service consumer for the given user information (e.g. IP address). (NOTE 1)	
easProviderId	String	O	0..1	Identifier of the ASP that provides the EAS.	
ueld	Gpsi	O	0..1	Identify the UE with GPSI. (NOTE 2, NOTE 4)	
ipAddr	IpAddr	C	0..1	IP address of the UE. (NOTE 3, NOTE 4)	
portNumber	Port	C	0..1	Indicates the UDP or TCP port number associated with the UE IP address as provided in the "ipAddr" attribute. (NOTE 5)	
appPortId	Port	O	0..1	Identifier of the Application Port ID associated with the EAS. (NOTE 6)	
suppFeat	SupportedFeatures	C	0..1	Used to negotiate the supported optional features of the API as described in clause 7.8. This attribute shall be provided in the HTTP POST request and success response.	
NOTE 1: This attribute shall be present when the service consumer is an EAS. If this attribute is not present, it shall be interpreted by the EES that it is an EEC that is requesting the UE ID.					
NOTE 2: This attribute may be present only if the service consumer is an EEC.					
NOTE 3: This attribute shall be present when the service consumer is an EAS. When the service consumer is an EEC, this attribute, if provided, may contain both UE's private IPv6 address and UE's private IPv4 address.					
NOTE 4: At least one of these attributes shall be present.					
NOTE 5: This attribute shall be present only when the service consumer is an EAS and the EAS recognizes the UE IP address is a public IP address different from the actual UE IP address (private IP address).					
NOTE 6: This attribute may be present only if the service consumer is an EAS.					

8.3.5.2.4 Type: UeldInfo

Table 8.3.5.2.4-1: Definition of type UeldInfo

Attribute name	Data type	P	Cardinality	Description	Applicability
uelds	array(Ueld)	C	1..N	Represents the UE Identifier(s).	

8.3.5.2.5 Type: Ueid

Table 8.3.5.2.5-1: Definition of type Ueid

Attribute name	Data type	P	Cardinality	Description	Applicability
edgeUeid	string	C	0..1	Represents the EES generated EDGE UE Identifier of the UE. This attribute shall be provided only if it is the Edge UE ID that needs to be returned. (NOTE)	
afSpecUeid	Gpsi	C	0..1	Identifier of the AF specific UE Identifier in the GPSI format of External ID. This attribute shall be provided only if it is the AF-specific UE ID that needs to be returned. (NOTE)	
easId	string	C	0..1	Represents the identifier of the EAS for which the provided UE ID is related. This attribute shall be present only if the "easIds" attribute was provided in the corresponding request.	
NOTE: These attributes are mutually exclusive. Either one of them shall be present.					

8.3.5.3 Simple data types and enumerations

8.3.5.3.1 Introduction

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

8.3.5.3.2 Simple data types

The simple data types defined in table 8.3.5.3.2-1 shall be supported.

Table 8.3.5.3.2-1: Simple data types

Type Name	Type Definition	Description	Applicability

8.3.6 Error Handling

8.3.6.1 General

For the Eees_UEIdentifier API, HTTP error handling shall be supported as specified in clause 7.7. In addition, the requirements in the following clauses are applicable for the Eees_UEIdentifier API.

8.3.6.2 Protocol Errors

No specific protocol errors for the Eees_UEIdentifier API are specified.

8.3.6.3 Application Errors

The application errors defined for the Eees_UEIdentifier API are listed in Table 8.3.6.3-1.

Table 8.3.6.3-1: Application errors

Application Error	HTTP status code	Description	Applicability

8.3.7 Feature negotiation

General feature negotiation procedures are defined in clause 7.8. Table 8.3.7-1 lists the supported features for Eees_UEIdentifier API.

Table 8.3.7-1: Supported Features

Feature number	Feature Name	Description

8.4 Eees_AppClientInformation API

8.4.1 Introduction

The Eees_AppClientInformation service shall use the Eees_AppClientInformation API.

The API URI of the Eees_AppClientInformation API shall be:

{apiRoot}/<apiName>/<apiVersion>

The request URIs used in HTTP requests shall have the Resource URI structure as defined in clause 7.5, i.e.:

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

with the following components:

- The {apiRoot} shall be set as described in clause 7.5.
- The <apiName> shall be "ees-appclientinformation".
- The <apiVersion> shall be "v1".
- The <apiSpecificResourceUriPart> shall be set as described in clause 8.4.2.

8.4.2 Resources

8.4.2.1 Overview

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

Figure 8.4.2.1-1 depicts the resource URIs structure for the Eees_AppClientInformation API.

{apiRoot}/ees-appclientinformation/<apiVersion>

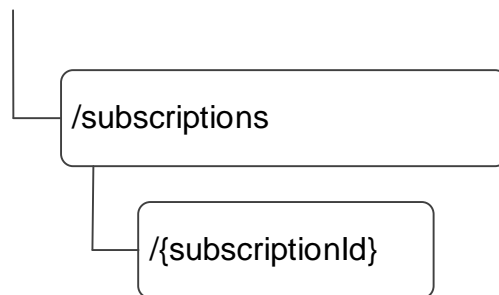


Figure 8.4.2.1-1: Resource URI structure of the Eees_AppClientInformation API

Table 8.4.2.1-1 provides an overview of the resources and applicable HTTP methods.

Table 8.4.2.1-1: Resources and methods overview

Resource name	Resource URI	HTTP method or custom operation	Description
Application Client Information Subscriptions	/subscriptions	POST	Creates a subscription for reporting of AC information to the EAS.
Individual Application Client Information Subscription	/subscriptions/{subscriptionId}	GET	Retrieves the Individual AC information subscription information identified by subscriptionId.
		PATCH	Partially updates the Individual AC information subscription identified by subscriptionId.
		PUT	Fully replaces the Individual AC information subscription identified by subscriptionId.
		DELETE	Removes the Individual AC information subscription identified by subscriptionId.

8.4.2.2 Resource: Application Client Information Subscriptions

8.4.2.2.1 Description

This resource represents all AC information subscriptions at a given EES.

8.4.2.2.2 Resource Definition

Resource URI: {apiRoot}/ees-appclientinformation/<apiVersion>/subscriptions

This resource shall support the resource URI variables defined in the table 8.4.2.2.2-1.

Table 8.4.2.2.2-1: Resource URI variables for this resource

Name	Data Type	Definition
apiRoot	string	See clause 7.5

8.4.2.2.3 Resource Standard Methods

8.4.2.2.3.1 POST

This method creates the AC information subscription at the EES for reporting of the AC capabilities. This method shall support the URI query parameters specified in the table 8.4.2.2.3.1-1.

Table 8.4.2.2.3.1-1: URI query parameters supported by the POST method on this resource

Name	Data type	P	Cardinality	Description
n/a				

This method shall support the request data structures specified in table 8.4.2.2.3.1-2 and the response data structures and response codes specified in table 8.4.2.2.3.1-3.

Table 8.4.2.2.3.1-2: Data structures supported by the POST Request Body on this resource

Data type	P	Cardinality	Description
ACInfoSubscription	M	1	Create a new AC information subscription.

Table 8.4.2.2.3.1-3: Data structures supported by the POST Response Body on this resource

Data type	P	Cardinality	Response codes	Description
ACInfoSubscription	M	1	201 Created	The individual AC information subscription resource created successfully. The information about the confirmed subscription at the EES is provided in the response body. The URI of the created resource shall be returned in the "Location" HTTP header.
NOTE: The mandatory HTTP error status code for the POST method listed in Table 5.2.6-1 of 3GPP TS 29.122 [6] also apply.				

Table 8.4.2.2.3.1-4: 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}/ees-appclientinformation/<apiVersion>/subscriptions/{subscriptionId}

8.4.2.2.4 Resource Custom Operations

None.

8.4.2.3 Resource: Individual Application Client Information Subscription

8.4.2.3.1 Description

This resource represents the individual application client information subscription of an EAS at a given EES.

8.4.2.3.2 Resource Definition

Resource URI: {apiRoot}/ees-appclientinformation/<apiVersion>/subscriptions/{subscriptionId}

This resource shall support the resource URI variables defined in the table 8.4.2.3.2-1.

Table 8.4.2.3.2-1: Resource URI variables for this resource

Name	Data Type	Definition
apiRoot	string	See clause 7.5
subscriptionId	string	Identifies an individual AC information subscription.

8.4.2.3.3 Resource Standard Methods

8.4.2.3.3.1 GET

This method retrieves the AC information subscription information at EES. This method shall support the URI query parameters specified in the table 8.4.2.3.3.1-1.

Table 8.4.2.3.3.1-1: URI query parameters supported by the GET method on this resource

Name	Data type	P	Cardinality	Description
n/a				

This method shall support the request data structures specified in table 8.4.2.3.3.1-2 and the response data structures and response codes specified in table 8.4.2.3.3.1-3.

Table 8.4.2.3.3.1-2: Data structures supported by the GET Request Body on this resource

Data type	P	Cardinality	Description
n/a			

Table 8.4.2.3.3.1-3: Data structures supported by the GET Response Body on this resource

Data type	P	Cardinality	Response codes	Description
ACInfoSubscription	M	1	200 OK	The AC information subscription information is returned by the EES.
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 EES. Redirection handling is described in clause 5.2.10 of TS 29.122 [6].
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 EES. Redirection handling is described in clause 5.2.10 of TS 29.122 [6].
NOTE: The mandatory HTTP error status code for the GET method listed in Table 5.2.6-1 of 3GPP TS 29.122 [6] also apply.				

Table 8.4.2.3.3.1-4: Headers supported by the 307 Response Code on this resource

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

Table 8.4.2.3.3.1-5: Headers supported by the 308 Response Code on this resource

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

8.4.2.3.3.2 PATCH

This method partially updates the individual AC information subscription information at the EES. This method shall support the URI query parameters specified in the table 8.4.2.3.3.2-1.

Table 8.4.2.3.3.2-1: URI query parameters supported by the PATCH method on this resource

Name	Data type	P	Cardinality	Description
n/a				

This method shall support the request data structures specified in table 8.4.2.3.3.2-2 and the response data structures and response codes specified in table 8.4.2.3.3.2-3.

Table 8.4.2.3.3.2-2: Data structures supported by the PATCH Request Body on this resource

Data type	P	Cardinality	Description
ACInfoSubscriptionPatch	M	1	Request to partially update the individual AC information subscription matching the subscriptionId at the EES.

Table 8.4.2.3.3.2-3: Data structures supported by the PATCH Response Body on this resource

Data type	P	Cardinality	Response codes	Description
ACInfoSubscription	M	1	200 OK	The individual AC information subscription matching the subscriptionId was modified successfully and the updated AC information subscription information is returned in the response.
n/a			204 No Content	The individual AC information subscription matching the subscriptionId was modified successfully.
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 EES. Redirection handling is described in clause 5.2.10 of TS 29.122 [6].
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 EES. Redirection handling is described in clause 5.2.10 of TS 29.122 [6].
NOTE: The mandatory HTTP error status code for the PATCH method listed in Table 5.2.6-1 of 3GPP TS 29.122 [6] also apply.				

Table 8.4.2.3.3.2-4: Headers supported by the 307 Response Code on this resource

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

Table 8.4.2.3.3.2-5: Headers supported by the 308 Response Code on this resource

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

8.4.2.3.3.3 PUT

This method updates the AC information subscription information at the EES by completely replacing the existing subscription data (except easId). This method shall support the URI query parameters specified in the table 8.4.2.3.3.3-1.

Table 8.4.2.3.3.3-1: URI query parameters supported by the PUT method on this resource

Name	Data type	P	Cardinality	Description
n/a				

This method shall support the request data structures specified in table 8.4.2.3.3.3-2 and the response data structures and response codes specified in table 8.4.2.3.3.3-3.

Table 8.4.2.3.3.3-2: Data structures supported by the PUT Request Body on this resource

Data type	P	Cardinality	Description
ACInfoSubscription	M	1	Details of individual AC information subscription matching the subscriptionId to be updated at the EES.

Table 8.4.2.3.3.3-3: Data structures supported by the PUT Response Body on this resource

Data type	P	Cardinality	Response codes	Description
ACInfoSubscription	M	1	200 OK	The individual AC information subscription matching the subscriptionId was modified successfully and the updated AC subscription information is returned in the response.
n/a			204 No Content	The individual AC information subscription matching the subscriptionId was modified successfully.
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 EES. Redirection handling is described in clause 5.2.10 of TS 29.122 [6].
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 EES. Redirection handling is described in clause 5.2.10 of TS 29.122 [6].
NOTE: The mandatory HTTP error status code for the PUT method listed in Table 5.2.6-1 of 3GPP TS 29.122 [6] also apply.				

Table 8.4.2.3.3.3-4: Headers supported by the 307 Response Code on this resource

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

Table 8.4.2.3.3.3-5: Headers supported by the 308 Response Code on this resource

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

8.4.2.3.3.4 DELETE

This method removes the AC information subscription information from the EES. This method shall support the URI query parameters specified in the table 8.4.2.3.3.4-1.

Table 8.4.2.3.3.4-1: URI query parameters supported by the DELETE method on this resource

Name	Data type	P	Cardinality	Description
n/a				

This method shall support the request data structures specified in table 8.4.2.3.3.4-2 and the response data structures and response codes specified in table 8.4.2.3.3.4-3.

Table 8.4.2.3.3.4-2: Data structures supported by the DELETE Request Body on this resource

Data type	P	Cardinality	Description
n/a			

Table 8.4.2.3.3.4-3: Data structures supported by the DELETE Response Body on this resource

Data type	P	Cardinality	Response codes	Description
n/a			204 No Content	The individual AC information subscription matching the subscriptionId is 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 EES. Redirection handling is described in clause 5.2.10 of TS 29.122 [6].
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 EES. Redirection handling is described in clause 5.2.10 of TS 29.122 [6].
NOTE: The mandatory HTTP error status code for the DELETE method listed in Table 5.2.6-1 of 3GPP TS 29.122 [6] also apply.				

Table 8.4.2.3.3.4-4: Headers supported by the 307 Response Code on this resource

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

Table 8.4.2.3.3.4-5: Headers supported by the 308 Response Code on this resource

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

8.4.2.3.4 Resource Custom Operations

None.

8.4.3 Custom Operations without associated resources

None.

8.4.4 Notifications

8.4.4.1 General

Table 8.4.4.1-1: Notifications overview

Notification	Callback URI	HTTP method or custom operation	Description (service operation)
AC Information Notification	{notificationDestination}	POST	Notifies the subscriber EAS the AC information.

8.4.4.2 AC Information Notification

8.4.4.2.1 Description

AC Information Notification is used by the EES to notify an EAS with AC information matching the filter criteria.

8.4.4.2.2 Target URI

The callback URI {**notificationDestination**} shall be used with the callback URI variables defined in table 8.4.4.2.2-1.

Table 8.4.4.2.2-1: Callback URI variables

Name	Data type	Definition
notificationDestination	Uri	Callback reference provided by the EAS during AC information subscription creation/update/modification procedure.

8.4.4.2.3 Standard Methods

8.4.4.2.3.1 POST

This method shall support the request data structures specified in table 8.4.4.2.3.1-1 and the response data structures and response codes specified in table 8.4.4.2.3.1-2.

Table 8.4.4.2.3.1-1: Data structures supported by the POST Request Body on this resource

Data type	P	Cardinality	Description
ACInfoNotification	M	1	Notification of AC(s) information.

Table 8.4.4.2.3.1-2: Data structures supported by the POST Response Body on this resource

Data type	P	Cardinality	Response codes	Description
n/a			204 No Content	The receipt of the Notification is 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 EAS where the notification should be sent. Redirection handling is described in clause 5.2.10 of TS 29.122 [6].
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 EAS where the notification should be sent. Redirection handling is described in clause 5.2.10 of TS 29.122 [6].
NOTE: The mandatory HTTP error status code for the POST method listed in Table 5.2.6-1 of 3GPP TS 29.122 [6] also apply.				

Table 8.2.4.4.3.1-3: Headers supported by the 307 Response Code on this resource

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

Table 8.2.4.4.3.1-4: Headers supported by the 308 Response Code on this resource

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

8.4.5 Data Model

8.4.5.1 General

This clause specifies the application data model supported by the API. Data types listed in clause 7.2 apply to this API

Table 8.4.5.1-1 specifies the data types defined specifically for the Eees_AppClientInformation API service.

Table 8.4.5.1-1: Eees_AppClientInformation API specific Data Types

Data type	Section defined	Description	Applicability
ACInfoSubscription	8.4.5.2.2	Represents the AC information subscription.	
ACInfoSubscriptionPatch	8.4.5.2.3	Used to request the partial update of AC information subscription.	
ACFilters	8.4.5.2.4	Used to list the set of characteristics to discover the ACs.	
ACInfoNotification	8.4.5.2.5	AC information notification matching the filter criteria.	
ACInformation	8.4.5.2.6	Used to represent the AC information in the AC information notification.	
EASBdlInd	8.4.5.2.7	Represents the EAS Bundle indication information.	EdgeApp_2
TrigCondParams	8.4.5.3.3	Represents the notification triggering conditions.	EdgeApp_2

Table 8.4.5.1-2 specifies data types re-used by the Eees_AppClientInformation API service.

Table 8.4.5.1-2: Re-used Data Types

Data type	Reference	Comments	Applicability
DateTime	3GPP TS 29.122 [6]	Used to capture the expiration time of EAS subscription for application client information reporting.	
ReportingInformation	3GPP TS 29.523 [13]	Used to indicate the reporting requirement, only the following information are applicable: - immRep - notifMethod - maxReportNbr - monDur - repPeriod	
Uri	3GPP TS 29.122 [6]		
WebsocketNotifConfig	3GPP TS 29.122 [6]	Following differences apply: - The SCEF is the EES; and - The SCS/AS is the subscribing EAS.	
SupportedFeatures	3GPP TS 29.571 [8]	Used to negotiate the applicability of optional features.	
TestNotification	3GPP TS 29.122 [6]	Following differences apply: - The SCEF is the EES; and - The SCS/AS is the subscribing EAS.	
LocationArea5G	3GPP TS 29.122 [6]	Used to define the geographic and topological area.	
ScheduledCommunicationTime	3GPP TS 29.122 [6]	Used to define the operation schedule of AC.	
Gpsi	3GPP TS 29.571 [8]	Used to identify the UE in the query parameter, for which location information is queried.	
ACProfile	3GPP TS 24.558 [14]	Used to represent the profile the information of the Application Client.	
ServiceArea	Clause 9.1.5.2.5	Used to represent the EAS service area in ACFilters data type.	
ACServiceKPIs	3GPP TS 24.558 [14]	Used to represent the minimum and maximum AC service KPI information of the Application Client.	
EASBdlReqs	Clause 8.1.5.2.9	Used to represent the EAS bundle requirements	EdgeApp_2
BdlType	Clause 8.1.5.3.6	Used to represent the EAS bundle type.	EdgeApp_2

8.4.5.2 Structured data types

8.4.5.2.1 Introduction

8.4.5.2.2 Type: ACInfoSubscription

Table 8.4.5.2.2-1: Definition of type ACInfoSubscription

Attribute name	Data type	P	Cardinality	Description	Applicability
easId	string	M	1	The application identifier of the EAS (e.g. URI, FQDN) subscribing for AC information report.	
acFltrs	array(ACFilters)	O	1..N	Filters to retrieve the information about particular ACs.	
expTime	DateTime	O	0..1	Indicates the expiration time of the subscription. If the expiration time is not present, then it indicates that the EAS subscription never expires.	
eventReq	ReportingInformation	O	0..1	Represents the reporting requirements of the AC information subscription. (NOTE 1)	
notificationDestination	Uri	C	0..1	URI where the notification on information about particular ACs should be delivered to. This attribute shall be present in HTTP POST message to EES and maybe present in HTTP PUT request.	
requestTestNotification	boolean	O	0..1	Set to true by Subscriber to request the EES to send a test notification as defined in clause 7.6. Set to false or omitted otherwise.	Notification_test_event
websocketNotificationConfig	WebsocketNotificationConfig	O	0..1	Configuration parameters to set up notification delivery over Websocket protocol as defined in clause 7.6.	Notification_websocket
suppFeat	SupportedFeatures	C	0..1	Used to negotiate the supported optional features of the API as described in clause 7.8. This attribute shall be provided in the HTTP POST request and in the response of successful resource creation.	
trigCondParams	array(TrigCondParams)	O	1..N	Contains the notification triggering conditions. (NOTE 2)	EdgeApp_2
NOTE 1: The applicable values of the ReportingInformation data type are, "immRep", "notifMethod", "maxReportNbr", "monDur", "repPeriod".					
NOTE 2: This attribute may be present only when the "eventReq" attribute is present and the "notifMethod" attribute within the provided "eventReq" attribute is present and set to "ON_EVENT_DETECTION". When the "eventReq" attribute is present and the "notifMethod" attribute within the provided "eventReq" attribute is present and set to "ON_EVENT_DETECTION" and this attribute is either not present or present and set to "UNSPECIFIED", then the triggering conditions to be used are implementation specific.					

8.4.5.2.3 Type: ACInfoSubscriptionPatch

Table 8.4.5.2.3-1: Definition of type ACInfoSubscriptionPatch

Attribute name	Data type	P	Cardinality	Description	Applicability
eventReq	ReportingInformation	O	0..1	The reporting requirements of the AC information event subscription to be updated.	
expTime	DateTime	O	0..1	Indicates the proposed expiration time of the subscription.	
notificationDestination	Uri	O	0..1	Updated URI where the AC information notification should be delivered to.	
acFiltrs	array(ACFilters)	O	1..N	Filters to retrieve the information about particular ACs.	
trigCondParams	array(TrigCondParams)	O	1..N	Contains the updated notification triggering conditions. (NOTE)	EdgeApp_2
NOTE: This attribute may be present only when the "eventReq" attribute is present and the "notifMethod" attribute within the provided "eventReq" attribute is present and set to "ON_EVENT_DETECTION". When the "eventReq" attribute is present and the "notifMethod" attribute within the provided "eventReq" attribute is present and set to "ON_EVENT_DETECTION" and this attribute is either not present or present and set to "UNSPECIFIED", then the triggering conditions to be used are implementation specific.					

8.4.5.2.4 Type: ACFilters

Table 8.4.5.2.4-1: Definition of type ACFilters

Attribute name	Data type	P	Cardinality	Description	Applicability
acTypesList	array(string)	O	1..N	List of AC types or categories to be matched.	
ecspIdsList	array(string)	O	1..N	The list of identifiers of the ECSPs associated with the EEC.	
acIdsList	array(string)	O	1..N	List of the identifiers of the AC(s) to be matched.	
svcArea	ServiceArea	O	0..1	EAS service area for identifying the UEs with matching expected geographical and topological location(s).	
maxAckpi	ACServiceKPIs	O	0..1	Maximum value of the AC service KPIs to identify the matched ACs. The service KPI values in this attribute need to be higher than the service KPIs information of the AC profiles provided during registrations and/or discovery need to be lower.	
minAckpi	ACServiceKPIs	O	0..1	Minimum value of the AC service KPIs to identify the matched ACs. The service KPI values in this attribute need to be lower than the service KPIs information of the AC profiles provided during registrations and/or discovery need to be lower.	
opSchds	array(ScheduledCommunicationTime)	O	1..N	The operation schedule of the EAS to be matched with operation schedule of the AC.	
ueIds	array(Gpsi)	O	1..N	List of UE identifiers hosting the AC.	
locInfs	LocationArea5G	O	0..1	List of location(s) of the UE(s) hosting the AC.	
easBundInd	EASBdInd	O	0..1	Contains the EAS bundle indication related information. (NOTE)	EdgeApp_2
NOTE: If the "bdInd" attribute or the "easBdReqs" attribute within the "easBundInd" attribute are not included, then the presence of this attribute indicates that all ACs that include EAS bundle information are targeted.					

8.4.5.2.5 Type: ACInfoNotification

Table 8.4.5.2.5-1: Definition of type ACInfoNotification

Attribute name	Data type	P	Cardinality	Description	Applicability
subId	string	M	1	String identifying the individual AC information subscription for which the AC information notification is delivered.	
acInfs	array(AC information)	M	1..N	List of notifications that include the information of the ACs matching the filter criteria.	

8.4.5.2.6 Type: ACInformation

Table 8.4.5.2.6-1: Definition of type ACInformation

Attribute name	Data type	P	Cardinality	Description	Applicability
acProfs	array(ACP profile)	M	1..N	List of ACs profile information.	
ueIds	array(Gpsi)	O	1..N	List of UE identifiers hosting the ACs.	
ueLocInfs	LocationArea5G	O	0..1	Location information of the UEs hosting the AC.	

8.4.5.2.7 Type: EASBdlInd

Table 8.4.5.2.7-1: Definition of type EASBdlInd

Attribute name	Data type	P	Cardinality	Description	Applicability
bdlType	BdlType	C	0..1	Represents the EAS bundle type. (NOTE)	
bdlId	string	C	0..1	Contains the identifier of the EAS bundle for identifying ACs with EAS bundle information in the AC Profile and with matching bundle EAS identification information. (NOTE)	
easBdlReqs	EASBdlReqs	C	0..1	Contains the EAS Bundle Requirements for identifying ACs with EAS bundle information in the AC Profile and with matching bundle requirements. (NOTE)	
parBundDet	boolean	C	0..1	Indicates partial bundle determination, for identifying ACs which include EAS bundle information in the AC Profile but for which only an EAS subset has been determined by EES. <ul style="list-style-type: none"> - When set to "true", it indicates that the partial bundle determination is requested. - When set to "false", it indicates that the partial bundle determination is not requested. - The default value when this attribute is omitted is "false". (NOTE)	
NOTE: At least one of these attributes shall be present.					

8.4.5.3 Simple data types and enumerations

8.4.5.3.1 Introduction

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

8.4.5.3.2 Simple data types

The simple data types defined in table 8.4.5.3.2-1 shall be supported.

Table 8.4.5.3.2-1: Simple data types

Type Name	Type Definition	Description	Applicability

8.4.5.3.3 Enumeration: TrigCondParams

Table 8.4.5.3.3-1: Enumeration TrigCondParams

Enumeration value	Description	Applicability
ANALYTICS_INFO	Indicates the resource load predictive analytics trigger condition.	
EEC_REGISTRATION	Indicates the EEC registration trigger condition.	
EAS_DISCOVERY	Indicates the EAS discovery trigger condition.	
UNSPECIFIED	Indicates that the triggering conditions are unspecified.	

8.4.6 Error Handling

8.4.6.1 General

For the Eees_AppClientInformation API, HTTP error responses, protocol errors and application errors shall be supported as specified in clause 7.7.

In addition, the requirements in the following clauses are applicable for the Eees_AppClientInformation API.

8.4.6.2 Protocol Errors

No specific protocol errors for the Eees_AppClientInformation API are specified.

8.4.6.3 Application Errors

The application errors defined for the Eees_AppClientInformation API are listed in Table 8.4.6.3-1.

Table 8.4.6.3-1: Application errors

Application Error	HTTP status code	Description
REGISTRATION_REQUIRED	403 Forbidden	Indicates that registration at the EES is required for the EAS to be authorized to perform the operation.

8.4.7 Feature negotiation

General feature negotiation procedures are defined in clause 7.8. Table 8.4.7-1 lists the supported features for Eees_AppClientInformation API.

Table 8.4.7-1: Supported Features

Feature number	Feature Name	Description
1	Notification_test_event	Testing of notification connection is supported according to clause 7.6.
2	Notification_websocket	The delivery of notifications over Websocket is supported according to clause 7.6. This feature requires that the Notification_test_event feature is also supported.
3	EdgeApp_2	This feature indicates the support of the enhancement to the Edge Applications. Within this feature the following enhancements are covered: <ul style="list-style-type: none"> - Support of the provisioning of the triggering conditions parameters. - Support of provisioning the EAS bundle indication information.

8.5 Eees_SessionWithQoS API

8.5.1 Introduction

The Eees_SessionWithQoS service shall use the Eees_SessionWithQoS API.

The API URI of the Eees_SessionWithQoS API shall be:

{apiRoot}/<apiName>/<apiVersion>

The request URIs used in HTTP requests shall have the Resource URI structure as defined in clause 7.5, i.e.:

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

with the following components:

- The {apiRoot} shall be set as described in clause 7.5.
- The <apiName> shall be "ees-session-with-qos".
- The <apiVersion> shall be "v1".
- The <apiSpecificResourceUriPart> shall be set as described in clause 8.5.2.

8.5.2 Resources

8.5.2.1 Overview

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

Figure 8.5.2.1-1 depicts the resource URIs structure for the Eees_SessionWithQoS API.

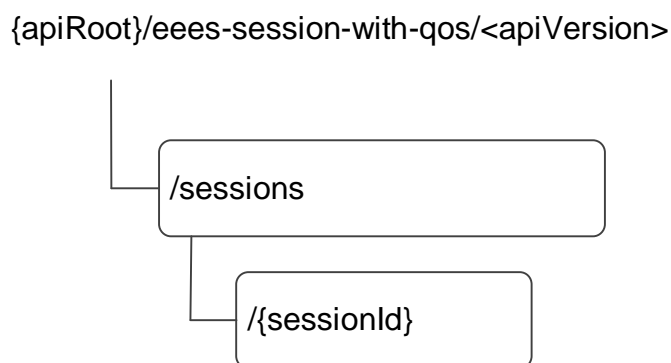


Figure 8.5.2.1-1: Resource URI structure of the Eees_SessionWithQoS API

Table 8.5.2.1-1 provides an overview of the resources and applicable HTTP methods.

Table 8.5.2.1-1: Resources and methods overview

Resource name	Resource URI	HTTP method or custom operation	Description
Sessions with QoS	/sessions	POST	Create a new individual Session with QoS
		GET	Read all subscription resources for given EAS.
Individual Session with QoS	/sessions/{sessionId}	PUT	Fully replace an existing Individual Session with QoS resource identified by a sessionId.
		PATCH	Partially update an existing Individual Session with QoS resource identified by a sessionId
		DELETE	Remove an Individual Session with QoS resource identified by a sessionId.
		GET	Read a subscription resource for a sessionId.

8.5.2.2 Resource: Sessions with QoS

8.5.2.2.1 Description

This resource represents session information of all the data sessions with a specific QoS setting at a given Edge Enabler Server.

8.5.2.2.2 Resource Definition

Resource URI: {apiRoot}/eees-session-with-qos/<apiVersion>/sessions

This resource shall support the resource URI variables defined in the table 8.5.2.2.2-1.

Table 8.5.2.2.2-1: Resource URI variables for this resource

Name	Data Type	Definition
apiRoot	string	See clause 7.5

8.5.2.2.3 Resource Standard Methods

8.5.2.2.3.1 POST

This method requests resources for a data session between AC and EAS with a specific QoS and may create the session information subscription at the Edge Enabler Server for receiving the user plane event notification of the session information. This method shall support the URI query parameters specified in table 8.5.2.2.3.1-1.

Table 8.5.2.2.3.1-1: URI query parameters supported by the POST method on this resource

Name	Data type	P	Cardinality	Description
n/a				

This method shall support the request data structures specified in table 8.5.2.2.3.1-2 and the response data structures and response codes specified in table 8.5.2.2.3.1-3.

Table 8.5.2.2.3.1-2: Data structures supported by the POST Request Body on this resource

Data type	P	Cardinality	Description
SessionWithQoS	M	1	Parameters to create a subscription for a session with required QoS for the service requirement.

Table 8.5.2.2.3.1-3: Data structures supported by the POST Response Body on this resource

Data type	P	Cardinality	Response codes	Description
SessionWithQoS	M	1	201 Created	The session is successfully set up with requested QoS, and the session information is provided in the response body. The URI of the created resource shall be returned in the "Location" HTTP header.
ProblemDetails	O	0..1	403 Forbidden	(NOTE 2)
NOTE 1: The mandatory HTTP error status code for the POST method listed in Table 5.2.6-1 of 3GPP TS 29.122 [6] also apply.				
NOTE 2: Failure cases are described in clause 8.5.6.3.				

Table 8.5.2.2.3.1-4: 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}/ ees-session-with-qos/<apiVersion>/sessions/{sessionId}

8.5.2.2.3.2 GET

The GET method allows to read all active subscriptions for a given EAS. The EAS shall initiate the HTTP GET request message and the EES shall respond to the message. This method shall support the URI query parameters specified in table 8.5.2.2.3.2-1.

Table 8.5.2.2.3.2-1: URI query parameters supported by the GET method on this resource

Name	Data type	P	Cardinality	Description
eas-id	string	M	1	Represents the application identifier of the EAS , e.g. URI, FQDN, that is querying the status of subscriptions.

This method shall support the request data structures specified in table 8.5.2.2.3.2-2 and the response data structures and response codes specified in table 8.5.2.2.3.2-3.

Table 8.5.2.2.3.2-2: Data structures supported by the GET Request Body on this resource

Data type	P	Cardinality	Description
n/a			

Table 8.5.2.2.3.2-3: Data structures supported by the GET Response Body on this resource

Data type	P	Cardinality	Response codes	Description
array(SessionWithQoS)	M	1..N	200 OK	The subscription information related to the request URI is 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 EES. Redirection handling is described in clause 5.2.10 of TS 29.122 [6].
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 EES. Redirection handling is described in clause 5.2.10 of TS 29.122 [6].
NOTE: The mandatory HTTP error status code for the GET method listed in Table 5.2.6-1 of 3GPP TS 29.122 [6] also apply.				

Table 8.5.2.2.3.2-4: Headers supported by the 307 Response Code on this resource

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

Table 8.5.2.2.3.2-5: Headers supported by the 308 Response Code on this resource

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

8.5.2.2.4 Resource Custom Operations

None.

8.5.2.3 Resource: Individual Session with QoS

8.5.2.3.1 Description

This resource represents an individual session information of the data session with a specific QoS setting at a given Edge Enabler Server.

8.5.2.3.2 Resource Definition

Resource URI: {apiRoot}/ees-session-with-qos/<apiVersion>/sessions/{sessionId}

This resource shall support the resource URI variables defined in the table 8.5.2.3.2-1.

Table 8.5.2.3.2-1: Resource URI variables for this resource

Name	Data Type	Definition
apiRoot	string	See clause 7.5.
sessionId	string	Contains the identifier of a Session with QoS.

8.5.2.3.3 Resource Standard Methods

8.5.2.3.3.1 PATCH

This method partially updates the QoS of the data session between AC and EAS. This method shall support the URI query parameters specified in the table 8.5.2.3.3.1-1.

Table 8.5.2.3.3.1-1: URI query parameters supported by the PATCH method on this resource

Name	Data type	P	Cardinality	Description
n/a				

This method shall support the request data structures specified in table 8.5.2.3.3.1-2 and the response data structures and response codes specified in table 8.5.2.3.3.1-3.

Table 8.5.2.3.3.1-2: Data structures supported by the PATCH Request Body on this resource

Data type	P	Cardinality	Description
SessionWithQoS Patch	M	1	Request to partially update the data session between AC and EAS with a specific QoS

Table 8.5.2.3.3.1-3: Data structures supported by the PATCH Response Body on this resource

Data type	P	Cardinality	Response codes	Description
SessionWithQoS	M	1	200 OK	The individual Session with QoS is successfully modified and the updated session with QoS context information is returned in the response
n/a			204 No Content	The individual Session with QoS is successfully modified.
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 EES. Redirection handling is described in clause 5.2.10 of TS 29.122 [6].
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 EES. Redirection handling is described in clause 5.2.10 of TS 29.122 [6].
ProblemDetails	O	0..1	403 Forbidden	(NOTE 2)
NOTE 1: The mandatory HTTP error status code for the PATCH method listed in Table 5.2.6-1 of 3GPP TS 29.122 [6] also apply.				
NOTE 2: Failure cases are described in clause 8.5.6.3.				

Table 8.5.2.3.3.1-4: Headers supported by the 307 Response Code on this resource

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

Table 8.5.2.3.3.1-5: Headers supported by the 308 Response Code on this resource

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

8.5.2.3.3.2 PUT

This method requests modification of QoS of the data session between AC and EAS and may modify the subscription of the event monitoring by subscribing to new events or removing subscriptions to existing events at the Edge Enabler Server for receiving the user plane event notification of the session information. This method shall support the URI query parameters specified in the table 8.5.2.3.3.2-1.

Table 8.5.2.3.3.2-1: URI query parameters supported by the PUT method on this resource

Name	Data type	P	Cardinality	Description
n/a				

This method shall support the request data structures specified in table 8.5.2.3.3.2-2 and the response data structures and response codes specified in table 8.5.2.3.3.2-3.

Table 8.5.2.3.3.2-2: Data structures supported by the PUT Request Body on this resource

Data type	P	Cardinality	Description
SessionWithQoS	M	1	Parameters to create a subscription for a session with required QoS for the service requirement.

Table 8.5.2.3.3.2-3: Data structures supported by the PUT Response Body on this resource

Data type	P	Cardinality	Response codes	Description
SessionWithQoS	M	1	200 OK	The individual Session with QoS is successfully modified and the updated session with QoS context information is returned in the response.
n/a			204 No Content	The individual Session with QoS is successfully modified.
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 EES. Redirection handling is described in clause 5.2.10 of TS 29.122 [6].
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 EES. Redirection handling is described in clause 5.2.10 of TS 29.122 [6].
ProblemDetails	O	0..1	403 Forbidden	(NOTE 2)
NOTE 1: The mandatory HTTP error status code for the PUT method listed in Table 5.2.6-1 of 3GPP TS 29.122 [6] also apply.				
NOTE 2: Failure cases are described in clause 8.5.6.3.				

Table 8.5.2.3.3.2-4: Headers supported by the 307 Response Code on this resource

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

Table 8.5.2.3.3.2-5: Headers supported by the 308 Response Code on this resource

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

8.5.2.3.3.3 DELETE

This method revokes the data session between AC and EAS with a specific QoS and unsubscribes to the related session with user plane event notification. This method shall support the URI query parameters specified in table 8.5.2.3.3.3-1.

Table 8.5.2.3.3.3-1: URI query parameters supported by the DELETE method on this resource

Name	Data type	P	Cardinality	Description
n/a				

This method shall support the request data structures specified in table 8.5.2.3.3.3-2 and the response data structures and response codes specified in table 8.5.2.3.3.3-3.

Table 8.5.2.3.3.3-2: Data structures supported by the DELETE Request Body on this resource

Data type	P	Cardinality	Description
n/a			

Table 8.5.2.3.3.3-3: Data structures supported by the DELETE Response Body on this resource

Data type	P	Cardinality	Response codes	Description
n/a			204 No Content	The individual Session with QoS resource matching the sessionId 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 EES. Redirection handling is described in clause 5.2.10 of TS 29.122 [6].
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 EES. Redirection handling is described in clause 5.2.10 of TS 29.122 [6].

NOTE: The mandatory HTTP error status code for the DELETE method listed in Table 5.2.6-1 of 3GPP TS 29.122 [6] also apply.

Table 8.5.2.3.3.3-4: Headers supported by the 307 Response Code on this resource

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

Table 8.5.2.3.3.3-5: Headers supported by the 308 Response Code on this resource

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

8.5.2.3.3.4 GET

The GET method allows to read a subscription. The EAS shall initiate the HTTP GET request message and the EES shall respond to the message. This method shall support the URI query parameters specified in table 8.5.2.3.3.4-1.

Table 8.5.2.3.3.4-1: URI query parameters supported by the GET method on this resource

Name	Data type	P	Cardinality	Description
n/a				

This method shall support the request data structures specified in table 8.5.2.3.3.4-2 and the response data structures and response codes specified in table 8.5.2.3.3.4-3.

Table 8.5.2.3.3.4-2: Data structures supported by the GET Request Body on this resource

Data type	P	Cardinality	Description
n/a			

Table 8.5.2.3.3.4-3: Data structures supported by the GET Response Body on this resource

Data type	P	Cardinality	Response codes	Description
SessionWithQoS	M	1	200 OK	The subscription information related to the request URI is 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 EES. Redirection handling is described in clause 5.2.10 of TS 29.122 [6].
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 EES. Redirection handling is described in clause 5.2.10 of TS 29.122 [6].
NOTE: The mandatory HTTP error status code for the GET method listed in Table 5.2.6-1 of 3GPP TS 29.122 [6] also apply.				

Table 8.5.2.3.3.4-4: Headers supported by the 307 Response Code on this resource

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

Table 8.5.2.3.3.4-5: Headers supported by the 308 Response Code on this resource

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

8.5.2.3.4 Resource Custom Operations

None.

8.5.3 Custom Operations without associated resources

None.

8.5.4 Notifications

8.5.4.1 General

Table 8.5.4.1-1: Notifications overview

Notification	Callback URI	HTTP method or custom operation	Description (service operation)
User Plane Event Notification	{notificationDestination}	POST	Notifies the EAS the subscribed user plane event(s).

8.5.4.2 User Plane Event Notification

8.5.4.2.1 Description

8.5.4.2.2 TargetURI

The callback URI {**notificationDestination**} shall be used with the callback URI variables defined in table 8.5.4.2.2-1.

Table 8.5.4.2.2-1: Callback URI variables

Name	Data type	Definition
notificationDestination	Uri	Callback reference provided by the EAS during session with QoS creation/update/modification procedure.

8.5.4.2.3 Standard Methods

8.5.4.2.3.1 POST

This method shall support the request data structures specified in table 8.5.4.2.3.1-1 and the response data structures and response codes specified in table 8.5.4.2.3.1-2.

Table 8.5.4.2.3.1-1: Data structures supported by the POST Request Body on this resource

Data type	P	Cardinality	Description
UserPlaneEventNotification	M	1	Notification of the user plane event on the data session.

Table 8.5.4.2.3.1-2: Data structures supported by the POST Response Body on this resource

Data type	P	Cardinality	Response codes	Description
n/a			204 No Content	The receipt of the Notification is 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 EAS where the notification should be sent. Redirection handling is described in clause 5.2.10 of TS 29.122 [6].
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 EAS where the notification should be sent. Redirection handling is described in clause 5.2.10 of TS 29.122 [6].
NOTE: The mandatory HTTP error status codes for the POST method listed in table 5.2.6-1 of 3GPP TS 29.122 [6] also apply.				

Table 8.5.4.2.3.1-3: Headers supported by the 307 Response Code on this resource

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

Table 8.5.4.2.3.1-4: Headers supported by the 308 Response Code on this resource

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

8.5.5 Data Model

8.5.5.1 General

This clause specifies the application data model supported by the API. Data types listed in clause 7.2 apply to this API

Table 8.5.5.1-1 specifies the data types defined specifically for the Eees_SessionWithQoS API service.

Table 8.5.5.1-1: Eees_SessionWithQoS API specific Data Types

Data type	Section defined	Description	Applicability
SessionWithQoS	8.5.5.2.2		
SessionWithQoSPatch	8.5.5.2.3		
UserPlaneEventNotification	8.5.5.2.4		

Table 8.5.5.1-2 specifies data types re-used by the Eees_SessionWithQoS API service.

Table 8.5.5.1-2: Re-used Data Types

Data type	Reference	Comments	Applicability
Gpsi	3GPP TS 29.571 [8]	Used to identify the UE, for which the related session with QoS is requested to.	
Ipv4Addr	3GPP TS 29.122 [6]	Identifying the IPv4 address of the UE.	
Ipv6Addr	3GPP TS 29.122 [6]	Identifying the IPv6 address of the UE.	
UserPlaneEvent	3GPP TS 29.122 [6]	Indicates the event reported by the EES.	
SponsorInformation	3GPP TS 29.122 [6]	Indicates a sponsor information	
QosMonitoringInformation	3GPP TS 29.122 [6]	Indicates the Qos Monitoring information	
DurationSecRm	3GPP TS 29.571 [8]	This data type is defined in the same way as the "DurationSec" data type, but with the OpenAPI "nullable: true" property.	
SupportedFeatures	3GPP TS 29.571 [8]	Used to negotiate the applicability of optional features.	
TestNotification	3GPP TS 29.122 [6]	This type represents a notification that can be sent to test whether a chosen notification mechanism works	
Uri	3GPP TS 29.122 [6]		
WebsocketNotifConfig	3GPP TS 29.122 [6]	This type represents configuration for the delivery of notifications over Websockets.	
Dnn	3GPP TS 29.571 [8]	Identifies a DNN.	
GroupId	3GPP TS 29.571 [8]	Used to present the internal group identifier in the AS session with QoS subscription/request.	
ExternalGroupId	3GPP TS 29.571 [8]	Used to present the external group identifier in the AS session with QoS subscription/request.	
Snsai	3GPP TS 29.571 [8]	Identifies a S-NSSAI	
FlowDescription	3GPP TS 29.514 [16]	Identifies an IP flow description.	
BitRateRm	3GPP TS 29.571 [8]	This data type is defined in the same way as the "BitRate" data type, but with the OpenAPI "nullable: true" property.	
UserPlaneEventReport	3GPP TS 29.122 [6]	Represents an event report for user plane.	
SupportedFeatures	3GPP TS 29.571 [8]	Used to negotiate the applicability of optional features.	
TrafficFilterInfo	8.6.5.2.12	Represents the traffic filter information.	EdgeApp_2

8.5.5.2 Structured data types

8.5.5.2.1 Introduction

8.5.5.2.2 Type: SessionWithQoS

Table 8.5.5.2.2-1: Definition of type SessionWithQoS

Attribute name	Data type	P	Cardinality	Description	Applicability
self	Uri	C	0..1	Link to the "Individual Session with QoS" resource. Shall only be present in the HTTP GET response on the "Sessions with QoS" resource.	
easId	string	M	1	The application identifier of the EAS (e.g. URI, FQDN).	
ueIpv4Addr	Ipv4Addr	O	0..1	IPv4 address of the UE. (NOTE 1)	
ueIpv6Addr	Ipv6Addr	O	0..1	IPv6 address of the UE. (NOTE 1)	
ipDomain	string	O	0..1	Identifies the IP domain. The attribute may only be provided if the ueIpv4Addr attribute is present.	
ueId	Gpsi	O	0..1	Identifier of the UE for which related session with QoS is requested to. (NOTE 1)	
intGrpId	GroupId	O	0..1	The internal group identifier, identifying the group of UEs for which related session with QoS is requested to. (NOTE 1)	
extGrpId	ExternalGroupId	O	0..1	The external group identifier, identifying the group of UEs for which the related session with QoS is requested to. (NOTE 1)	
ipFlows	array(FlowDescription)	M	1..N	Contains the flow description for the Uplink and/or Downlink IP flows. (NOTE 3)	
qosReference	string	O	0..1	Identifies a pre-defined QoS information (NOTE 2)	
trafFilterInfo	TrafficFilterInfo	O	0..1	Represents the traffic filter information. This attribute may be present only if the "event" attribute is set to "UP_PATH_CHG", "ACR_MONITORING" and/or "ACR_FACILITATION". (NOTE 3)	EdgeApp_2
altQosReference	array(string)	O	1..N	Identifies an ordered list of pre-defined QoS information. The lower the index of the array for a given entry, the higher the priority.	
events	array(UserPlaneEvent)	O	1..N	Indicates the events subscribed by the EAS.	
sponsorInformation	SponsorInformation	O	0..1	Describes the sponsor information.	
qosMonInfo	QosMonitoringInformation	O	0..1	Qos Monitoring information. It may be present when the event "QOS_MONITORING" is subscribed.	
notificationDestination	Uri	C	0..1	URI where the event notification shall be delivered to. This attribute shall be present if the "events" attribute is included.	
dnn	Dnn	O	0..1	Dnn of the PDU session, a full DNN with both the Network Identifier and Operator Identifier, or a DNN with the Network Identifier only.	
snssai	Snssai	O	0..1	S-NSSAI of the PDU session.	
maxbrUl	BitRate	O	0..1	Indicates the (requested) maximum bandwidth in uplink. (NOTE 2)	
maxbrDl	BitRate	O	0..1	Indicates the (requested) maximum bandwidth in downlink. (NOTE 2)	

disUeNotif	boolean	O	0..1	Indicates to disable QoS flow parameters signalling to the UE when the SMF is notified by the NG-RAN of changes in the fulfilled QoS situation when it is included and set to "true". The fulfilled situation is either the QoS profile or an Alternative QoS Profile. The default value "false" shall apply, if the attribute is not present and has not been supplied previously.	
requestTestNotification	boolean	O	0..1	Set to true by Subscriber to request the EES to send a test notification as defined in 3GPP TS 29.122 [6]. Set to false or omitted otherwise.	Notification_test_event
websocketNotification	Websocket Notification	O	0..1	Configuration parameters to set up notification delivery over Websocket protocol as defined in 3GPP TS 29.122 [6].	Notification_websocket
supFeat	Supported Features	C	0..1	Used to negotiate the supported optional features of the API as described in clause 7.8. This attribute shall be provided in the HTTP POST request and in the response of successful resource creation.	
NOTE 1: Only one of UE IP address (ipv4Addr or ipv6Addr), UE Identifier (ueld), Internal group identifier (intGrpId), or External group identifier (extGrpId) shall be included.					
NOTE 2: Only one of requested QoS (qosReference) or Requested bandwidth (maxbuUI and/or maxbtDI) shall be included.					
NOTE 3: If the "EdgeApp_2" feature is supported, the "ipFlows" attribute within the "trafFilterInfo" attribute shall take precedence over the "ipFlows" attribute when both are provided.					

8.5.5.2.3 Type: SessionWithQoSpatch

Table 8.5.5.2.3-1: Definition of type SessionWithQoSpatch

Attribute name	Data type	P	Cardinality	Description	Applicability
ipFlows	array(Flow Description)	O	1..N	Contains the flow description for the Uplink and/or Downlink IP flows. (NOTE)	
trafFilterInfo	TrafficFilterInfo	O	0..1	Represents the traffic filter information. This attribute may be present only if the "event" attribute is set to "UP_PATH_CHG", "ACR_MONITORING" and/or "ACR_FACILITATION". (NOTE)	EdgeApp_2
qosReference	string	O	0..1	Identifies a pre-defined QoS information.	
altQosReference	array(string)	O	1..N	Identifies an ordered list of pre-defined QoS information. The lower the index of the array for a given entry, the higher the priority.	
events	array(UserPlaneEvent)	O	1..N	Indicates the event subscribed by the EAS.	
sponsorInformation	SponsorInformation	O	0..1	Describes the sponsor information such as who is sponsoring the traffic.	
qosMonInfo	QosMonitoringInformationRm	O	0..1	Qos Monitoring information. It can be present when the event "QOS_MONITORING" is subscribed.	
notificationDestination	Uri	O	0..1	URI where the monitoring event notification should be delivered to.	
maxbrUl	BitRateRm	O	0..1	Indicates the (requested) maximum bandwidth in uplink.	
maxbrDl	BitRateRm	O	0..1	Indicates the (requested) maximum bandwidth in downlink.	
disUeNotif	boolean	O	0..1	Indicates to disable QoS flow parameters signalling to the UE when the SMF is notified by the NG-RAN of changes in the fulfilled QoS situation when it is included and set to "true". The fulfilled situation is either the QoS profile or an Alternative QoS Profile. The default value "false" shall apply, if the attribute is not present and has not been supplied previously.	
NOTE: If the "EdgeApp_2" feature is supported, the "ipFlows" attribute within the "trafFilterInfo" attribute shall take precedence over the "ipFlows" attribute when both are provided.					

8.5.5.2.4 Type: UserPlaneEventNotification

Table 8.5.5.2.4-1: Definition of type UserPlaneEventNotification

Attribute name	Data type	P	Cardinality	Description	Applicability
sessionId	string	M	1	String identifying the individual data session information for which the QoS event notification is delivered.	
eventReports	array(UserPlaneEventReport)	M	1..N	List of user plane event reports and application information that include the QoS event information of the data session.	

8.5.5.3 Simple data types and enumerations

None.

8.5.6 Error Handling

8.5.6.1 General

For the Eees_SessionWithQoS API, HTTP error handling shall be supported as specified in clause 7.7. In addition, the requirements in the following clauses are applicable for the Eees_SessionWithQoS API.

8.5.6.2 Protocol Errors

No specific protocol errors for the Eees_SessionWithQoS API are specified.

8.5.6.3 Application Errors

The application errors defined for the Eees_SessionWithQoS API are listed in Table 8.5.6.3-1.

Table 8.5.6.3-1: Application errors

Application Error	HTTP status code	Description
PFD_MNGT_NOT_SUPPORTED	403 Forbidden	Indicates that the AS Session with QoS Subscription creation/update is rejected because PFD Management is needed to fulfill the request but it is not supported by the 3GPP network.

8.5.7 Feature negotiation

General feature negotiation procedures are defined in clause 7.8. Table 8.5.7-1 lists the supported features for Eees_SessionWithQoS API.

Table 8.5.7-1: Supported Features

Feature number	Feature Name	Description
1	Notification_test_event	Testing of notification connection is supported according to clause 7.6.
2	Notification_websocket	The delivery of notifications over Websocket is supported according to clause 7.6. This feature requires that the Notification_test_event feature is also supported.

8.6 Eees_ACRManagementEvent API

8.6.1 Introduction

The Eees_ACRManagementEvent service shall use the Eees_ACRManagementEvent API.

The API URI of the Eees_ACRManagementEvent API shall be:

{apiRoot}/<apiName>/<apiVersion>

The request URIs used in HTTP requests shall have the Resource URI structure as defined in clause 7.5, i.e:

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

with the following components:

- The {apiRoot} shall be set as described in clause 7.5.
- The <apiName> shall be "ees-acrmngntevent".
- The <apiVersion> shall be "v1".
- The <apiSpecificResourceUriPart> shall be set as described in clause 8.6.2.

8.6.2 Resources

8.6.2.1 Overview

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

Figure 8.6.2.1-1 depicts the resource URIs structure for the Eees_ACRManagementEvent API.

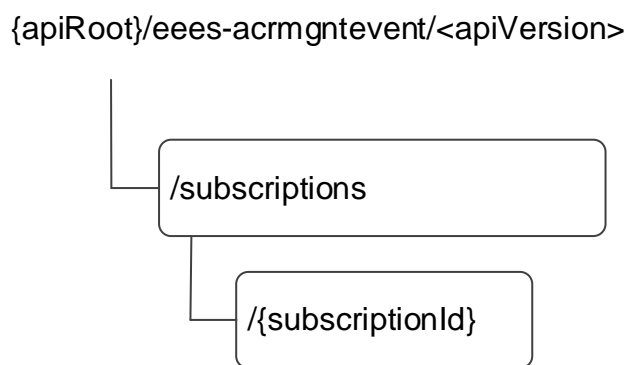


Figure 8.6.2.1-1: Resource URI structure of the Eees_ACRManagementEvent API

Table 8.6.2.1-1 provides an overview of the resources and applicable HTTP methods.

Table 8.6.2.1-1: Resources and methods overview

Resource name	Resource URI	HTTP method or custom operation	Description
ACR Management Events Subscriptions	/subscriptions	GET	Query all the subscriptions.
		POST	Create a new Individual ACR Management Events Subscription resource.
Individual ACR Management Events Subscription	/subscriptions/{subscriptionId}	GET	Query an existing Individual ACR Management Events Subscription resource identified by a subscriptionId.
		PUT	Fully replace an existing Individual ACR Management Events Subscription resource identified by a subscriptionId.
		PATCH	Partially update an existing Individual ACR Management Events Subscription resource identified by a subscriptionId.
		DELETE	Remove an Individual ACR Management Events Subscription resource identified by a subscriptionId.

8.6.2.2 Resource: ACR Management Events Subscriptions

8.6.2.2.1 Description

This resource represents ACR Management Events Subscriptions at a given Edge Enabler Server.

8.6.2.2.2 Resource Definition

Resource URI: **{apiRoot}/eees-acrmgntevent/<apiVersion>/subscriptions**

This resource shall support the resource URI variables defined in the table 8.6.2.2.2-1.

Table 8.6.2.2.2-1: Resource URI variables for this resource

Name	Data Type	Definition
apiRoot	string	See clause 7.5

8.6.2.2.3 Resource Standard Methods

8.6.2.2.3.1 POST

This method requests to create an Individual ACR Management Event Subscription resource at the EES for receiving the notifications of ACR management events. This method shall support the URI query parameters specified in table 8.6.2.2.3.1-1.

Table 8.6.2.2.3.1-1: URI query parameters supported by the POST method on this resource

Name	Data type	P	Cardinality	Description
n/a				

This method shall support the request data structures specified in table 8.6.2.2.3.1-2 and the response data structures and response codes specified in table 8.6.2.2.3.1-3.

Table 8.6.2.2.3.1-2: Data structures supported by the POST Request Body on this resource

Data type	P	Cardinality	Description
AcrMgntEventsSubscription	M	1	Parameters to create a subscription for notifications of ACR management events.

Table 8.6.2.2.3.1-3: Data structures supported by the POST Response Body on this resource

Data type	P	Cardinality	Response codes	Description
AcrMgntEventsSubscription	M	1	201 Created	An Individual ACR Management Events Subscription resource is successfully created, and the subscription information is provided in the response body. The URI of the created resource shall be returned in the "Location" HTTP header.
ProblemDetails	O	0..1	403 Forbidden	(NOTE 2)
NOTE 1: The mandatory HTTP error status code for the POST method listed in Table 5.2.6-1 of 3GPP TS 29.122 [6] also apply.				
NOTE 2: Failure cases are described in clause 8.6.6.3.				

Table 8.6.2.3.1-4: 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}/ees-acrmgntevent/<apiVersion>/subscriptions/{subscriptionId}

8.6.2.3.2 GET

This method retrieves all the ACR Management Events Subscriptions information at EES. This method shall support the URI query parameters specified in the table 8.6.2.3.2-1.

Table 8.6.2.3.2-1: URI query parameters supported by the GET method on this resource

Name	Data type	P	Cardinality	Description
supp-feat	SupportedFeatures	O	0..1	The features supported by the EAS.

This method shall support the request data structures specified in table 8.6.2.3.2-2 and the response data structures and response codes specified in table 8.6.2.3.2-3.

Table 8.6.2.3.2-2: Data structures supported by the GET Request Body on this resource

Data type	P	Cardinality	Description
n/a			

Table 8.6.2.3.2-3: Data structures supported by the GET Response Body on this resource

Data type	P	Cardinality	Response codes	Description
array(AcrMgmtEventsSubscription)	M	1..N	200 OK	All the ACR Management Events Subscriptions information is returned by the EES.
n/a			307 Temporary Redirect	Temporary redirection, during subscription retrieval. The response shall include a Location header field containing an alternative URI of the resource located in an alternative EES. Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [6].
n/a			308 Permanent Redirect	Permanent redirection, during subscription retrieval. The response shall include a Location header field containing an alternative URI of the resource located in an alternative EES. Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [6].
NOTE: The mandatory HTTP error status code for the GET method listed in Table 5.2.6-1 of 3GPP TS 29.122 [6] also apply.				

Table 8.6.2.3.2-4: Headers supported by the 307 Response Code on this resource

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

Table 8.6.2.2.3.2-5: Headers supported by the 308 Response Code on this resource

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

8.6.2.2.4 Resource Custom Operations

None.

8.6.2.3 Resource: Individual ACR Management Events Subscription

8.6.2.3.1 Description

This resource represents an existing Individual ACR Management Events Subscription at a given EES.

8.6.2.3.2 Resource Definition

Resource URI: {apiRoot}/eees-acrmgntevent/<apiVersion>/subscriptions/{subscriptionId}

This resource shall support the resource URI variables defined in the table 8.6.2.3.2-1.

Table 8.6.2.3.2-1: Resource URI variables for this resource

Name	Data Type	Definition
apiRoot	string	See clause 7.5.
subscriptionId	string	Contains the identifier of an ACR Management Events Subscription.

8.6.2.3.3 Resource Standard Methods

8.6.2.3.3.1 PATCH

This method partially updates an existing Individual ACR Management Events Subscription. This method shall support the URI query parameters specified in the table 8.6.2.3.3.1-1.

Table 8.6.2.3.3.1-1: URI query parameters supported by the PATCH method on this resource

Name	Data type	P	Cardinality	Description
n/a				

This method shall support the request data structures specified in table 8.6.2.3.3.1-2 and the response data structures and response codes specified in table 8.6.2.3.3.1-3.

Table 8.6.2.3.3.1-2: Data structures supported by the PATCH Request Body on this resource

Data type	P	Cardinality	Description
AcrMgntEventsSubscriptionPatch	M	1	Request to partially update an existing Individual ACR Management Events Subscription.

Table 8.6.2.3.3.1-3: Data structures supported by the PATCH Response Body on this resource

Data type	P	Cardinality	Response codes	Description
AcrMgmtEventsSubscription	M	1	200 OK	The Individual ACR Management Events Subscription is successfully modified and the updated subscription information is returned in the response.
n/a			204 No Content	The Individual ACR Management Events Subscription is successfully modified.
n/a			307 Temporary Redirect	Temporary redirection, during subscription modification. The response shall include a Location header field containing an alternative URI of the resource located in an alternative EES. Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [6].
n/a			308 Permanent Redirect	Permanent redirection, during subscription modification. The response shall include a Location header field containing an alternative URI of the resource located in an alternative EES. Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [6].
ProblemDetails	O	0..1	403 Forbidden	(NOTE 2)
NOTE 1: The mandatory HTTP error status code for the PATCH method listed in Table 5.2.6-1 of 3GPP TS 29.122 [6] also apply.				
NOTE 2: Failure cases are described in clause 8.6.6.3.				

Table 8.6.2.3.3.1-4: Headers supported by the 307 Response Code on this resource

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

Table 8.6.2.3.3.1-5: Headers supported by the 308 Response Code on this resource

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

8.6.2.3.3.2 PUT

This method requests fully replacement of an existing Individual ACR Management Events Subscription at the EES. The request shall not change the values of the "easId", "tgtUeId", "requestTestNotification", "websocketNotifConfig" and/or "suppFeat" attributes within the AcrMgmtEventsSubscription data type. This method shall support the URI query parameters specified in the table 8.6.2.3.3.2-1.

Table 8.6.2.3.3.2-1: URI query parameters supported by the PUT method on this resource

Name	Data type	P	Cardinality	Description
n/a				

This method shall support the request data structures specified in table 8.6.2.3.3.2-2 and the response data structures and response codes specified in table 8.6.2.3.3.2-3.

Table 8.6.2.3.3.2-2: Data structures supported by the PUT Request Body on this resource

Data type	P	Cardinality	Description
AcrMgmtEventsSubscription	M	1	Parameters to replace an existing Individual ACR Management Events Subscription.

Table 8.6.2.3.3.2-3: Data structures supported by the PUT Response Body on this resource

Data type	P	Cardinality	Response codes	Description
AcrMgmtEventsSubscription	M	1	200 OK	The existing Individual ACR Management Events Subscription is successfully replaced and the updated subscription information is returned in the response.
n/a			204 No Content	The existing Individual ACR Management Events Subscription is successfully modified.
n/a			307 Temporary Redirect	Temporary redirection, during subscription modification. The response shall include a Location header field containing an alternative URI of the resource located in an alternative EES. Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [6].
n/a			308 Permanent Redirect	Permanent redirection, during subscription modification. The response shall include a Location header field containing an alternative URI of the resource located in an alternative EES. Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [6].
ProblemDetails	O	0..1	403 Forbidden	(NOTE 2)
NOTE 1: The mandatory HTTP error status code for the PUT method listed in Table 5.2.6-1 of 3GPP TS 29.122 [6] also apply.				
NOTE 2: Failure cases are described in clause 8.6.6.3				

Table 8.6.2.3.3.2-4: Headers supported by the 307 Response Code on this resource

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

Table 8.6.2.3.3.2-5: Headers supported by the 308 Response Code on this resource

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

8.6.2.3.3.3 DELETE

This method deletes an existing Individual ACR Management Events Subscription. This method shall support the URI query parameters specified in table 8.6.2.3.3.3-1.

Table 8.6.2.3.3.3-1: URI query parameters supported by the DELETE method on this resource

Name	Data type	P	Cardinality	Description
n/a				

This method shall support the request data structures specified in table 8.6.2.3.3.3-2 and the response data structures and response codes specified in table 8.6.2.3.3.3-3.

Table 8.6.2.3.3.3-2: Data structures supported by the DELETE Request Body on this resource

Data type	P	Cardinality	Description
n/a			

Table 8.6.2.3.3.3-3: Data structures supported by the DELETE Response Body on this resource

Data type	P	Cardinality	Response codes	Description
n/a			204 No Content	The existing Individual ACR Management Events Subscription is successfully deleted.
n/a			307 Temporary Redirect	Temporary redirection, during subscription termination. The response shall include a Location header field containing an alternative URI of the resource located in an alternative EES. Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [6].
n/a			308 Permanent Redirect	Permanent redirection, during subscription termination. The response shall include a Location header field containing an alternative URI of the resource located in an alternative EES. Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [6].
NOTE: The mandatory HTTP error status code for the DELETE method listed in Table 5.2.6-1 of 3GPP TS 29.122 [6] also apply.				

Table 8.6.2.3.3.3-4: Headers supported by the 307 Response Code on this resource

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

Table 8.6.2.3.3.3-5: Headers supported by the 308 Response Code on this resource

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

8.6.2.3.3.4 GET

This method retrieves the location information subscription information at EES. This method shall support the URI query parameters specified in the table 8.6.2.3.3.4-1.

Table 8.6.2.3.3.4-1: URI query parameters supported by the GET method on this resource

Name	Data type	P	Cardinality	Description
supp-feat	SupportedFeatures	O	0..1	The features supported by the service consumer.

This method shall support the request data structures specified in table 8.6.2.3.3.4-2 and the response data structures and response codes specified in table 8.6.2.3.3.4-3.

Table 8.6.2.3.3.4-2: Data structures supported by the GET Request Body on this resource

Data type	P	Cardinality	Description
n/a			

Table 8.6.2.3.3.4-3: Data structures supported by the GET Response Body on this resource

Data type	P	Cardinality	Response codes	Description
AcrMgmtEventsSubscription	M	1	200 OK	The Individual ACR Management Events Subscription is returned by the EES.
n/a			307 Temporary Redirect	Temporary redirection, during subscription retrieval. The response shall include a Location header field containing an alternative URI of the resource located in an alternative EES. Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [6].
n/a			308 Permanent Redirect	Permanent redirection, during subscription retrieval. The response shall include a Location header field containing an alternative URI of the resource located in an alternative EES. Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [6].
NOTE: The mandatory HTTP error status code for the GET method listed in Table 5.2.6-1 of 3GPP TS 29.122 [6] also apply.				

Table 8.6.2.3.3.4-4: Headers supported by the 307 Response Code on this resource

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

Table 8.6.2.3.3.4-5: Headers supported by the 308 Response Code on this resource

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

8.6.2.3.4 Resource Custom Operations

None.

8.6.3 Custom Operations without associated resources

None.

8.6.4 Notifications

8.6.4.1 General

Table 8.6.4.1-1: Notifications overview

Notification	Callback URI	HTTP method or custom operation	Description (service operation)
ACR Management Events Notification	{notificationDestination}	POST	Notifies the service consumer the subscribed ACR management event(s).
User Plane Path Change Availability Notification	{notificationDestination}/report-availability	report-availability (POST)	Notifies the service consumer of the availability of user plane path management events monitoring via the 3GPP 5GC network (e.g. due to UE mobility from 5GC to EPC).

8.6.4.2 ACR Management Events Notification

8.6.4.2.1 Description

8.6.4.2.2 Notification definition

The POST method is used by the EES for the notifications of subscribed ACR management event(s) and the callback URI shall be provided by the service consumer during the creation of the Individual ACR Management Events Subscription resource.

Callback URI: {notificationDestination}

This method shall support the URI query parameters specified in table 8.6.4.2.2-1.

Table 8.6.4.2.2-1: URI query parameters supported by the POST method on this resource

Name	Data type	P	Cardinality	Description

This method shall support the request data structures specified in table 8.6.4.2.2-2 and the response data structures and response codes specified in table 8.6.4.2.2-3.

Table 8.6.4.2.2-2: Data structures supported by the POST Request Body on this resource

Data type	P	Cardinality	Description
AcrMgntEventsNotification	M	1	Notification of the ACR management events.

Table 8.6.4.2.2-3: Data structures supported by the POST Response Body on this resource

Data type	P	Cardinality	Response codes	Description
n/a			204 No Content	The receipt of the Notification is acknowledged.
EasAckInformation	M	1	200 OK	The receipt of the Notification is acknowledged and includes the acknowledgement information.
N/A			307 Temporary Redirect	Temporary redirection, during event notification. 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 [6].
N/A			308 Permanent Redirect	Permanent redirection, during event notification. 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 [6].
NOTE: The mandatory HTTP error status codes for the POST method listed in table 5.2.6-1 of 3GPP TS 29.122 [6] also apply.				

Table 8.6.4.2.2-4: Headers supported by the 307 Response Code on this resource

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

Table 8.6.4.2.2-5: Headers supported by the 308 Response Code on this resource

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

8.6.4.3 User Plane Path Change Availability Notification

8.6.4.3.1 Description

The User Plane Path Change Availability Notification is used by the EES to notify the service consumer of the availability of user plane path management events monitoring via the 3GPP 5GC network (e.g. due to UE mobility from 5GC to EPC).

8.6.4.3.2 Target URI

The Callback URI "{notificationDestination}/report-availability" shall be used with the callback URI variables defined in table 8.6.4.3.2-1.

Table 8.6.4.3.2-1: Callback URI variables

Name	Data type	Definition
notificationDestination	Uri	Callback reference provided by the service consumer during the ACR Management Event subscription creation/update/modification procedure.

8.6.4.3.3 Standard Methods

8.6.4.3.3.1 POST

This method shall support the request data structures specified in table 8.6.4.3.3.1-1 and the response data structures and response codes specified in table 8.6.4.3.3.1-2.

Table 8.6.4.3.3.1-1: Data structures supported by the POST Request Body on this resource

Data type	P	Cardinality	Description
AvailabilityNotif	M	1	Notification of the ACR management events.

Table 8.6.4.3.3.1-2: Data structures supported by the POST Response Body on this resource

Data type	P	Cardinality	Response codes	Description
n/a			204 No Content	The notification is successfully received.
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 [6].
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 [6].
NOTE: The mandatory HTTP error status codes for the POST method listed in table 5.2.6-1 of 3GPP TS 29.122 [6] also apply.				

Table 8.6.4.3.3.1-3: Headers supported by the 307 Response Code on this resource

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

Table 8.6.4.3.3.1-4: Headers supported by the 308 Response Code on this resource

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

8.6.5 Data Model

8.6.5.1 General

This clause specifies the application data model supported by the API. Data types listed in clause 7.2 apply to this API

Table 8.6.5.1-1 specifies the data types defined specifically for the Eees_ACRManagementEvent API service.

Table 8.6.5.1-1: Eees_ACRManagementEvent API specific Data Types

Data type	Section defined	Description	Applicability
AcrMgntEventFailureCode	8.6.5.3.6	Represents the reason for ACR Management subscription failure for an event.	
AcrMgntEventFilter	8.6.5.3.4	Represents the ACR Management Event filter.	
AcrMgntEventsSubscription	8.6.5.2.2		
AcrMgntEventSubsc	8.6.5.2.3		
AcrMgntEventsSubscriptionPatch	8.6.5.2.4		
AcrMgntEventsNotification	8.6.5.2.5		
AcrMgntEventReport	8.6.5.2.6		
ACRParameters	8.6.5.2.13	Represents ACR parameters.	EdgeApp_2
ActStatus	8.6.5.3.5	Represents ACT status, i.e. ACT start or stop.	
AvailabilityNotif	8.6.5.2.11	Represents the availability information of user plane path management events monitoring via the 3GPP 5GC network.	
AvailabilityStatus	8.6.5.3.7	Represents the availability status.	
EasAckInformation	8.6.5.2.15	Represents the acknowledgement information from EAS in response to ACR notifications.	EdgeApp_2
EasInBundleInfo	8.6.5.2.16	Represents EAS in a bundle information.	EdgeApp_2
FailureAcrMgntEventInfo	8.6.5.2.7		
AcrMgntEvent	8.6.5.3.3		
IndtUeIdentification	8.6.5.2.10	Contains individual UE identification information.	
ResultCode	8.6.5.3.8	Contains the EAS acknowledgement response message.	EdgeApp_2
SelectedACRScenarios	8.6.5.2.12	Represents the selected ACR scenario(s) applicable for a given combination of AC and UE.	EdgeApp_2
TargetUeIdentification	8.6.5.2.8	Contains target UE(s) identification information.	
TrafficFilterInfo	8.6.5.2.14	Represents the traffic filter information.	EdgeApp_2
UpPathChangeInfo	8.6.5.2.9	Contains user plane path change information.	

Table 8.6.5.1-2 specifies data types re-used by the Eees_ACRManagementEvent API service.

Table 8.6.5.1-2: Re-used Data Types

Data type	Reference	Comments	Applicability
ACRScenario	Clause 9.1.5.3.3	Represent the ACR scenarios.	EdgeApp_2
EasCharacteristics	3GPP TS 24.558 [14]	Represents the EAS characteristics.	
DateTime	3GPP TS 29.122 [6]		
Dnai	3GPP TS 29.571 [8]	Identifies a DNAI.	
DnaiChangeType	3GPP TS 29.571 [8]		
DnaiChangeTypeRm	3GPP TS 29.571 [8]		
DomainNameProtocol	3GPP TS 29.122 [6]	Represents the additional protocol and protocol field for domain names to be matched.	EdgeApp_2
Endpoint	Clause 8.1.5.2.5	Represents the endpoint information.	
ExternalGroupId	3GPP TS 29.571 [8]	Represents an external group of UEs.	
ExternalId	3GPP TS 29.122 [6]	Represents an external identifier of a UE.	
Gpsi	3GPP TS 29.571 [8]		
GroupId	3GPP TS 29.571 [8]	Represents an internal group of UEs.	
IpAddr	3GPP TS 29.571 [8]		
Ipv4Addr	3GPP TS 29.122 [6]	Identifying the IPv4 address of the UE.	
Ipv6Prefix	3GPP TS 29.571 [8]	Identifies an IPv6 Prefix.	
ReportingInformation	3GPP TS 29.523 [13]		
RouteToLocation	3GPP TS 29.571 [8]	Describes the traffic routes to the locations of the application.	
SupportedFeatures	3GPP TS 29.571 [8]	Used to negotiate the applicability of optional features.	
ServiceArea	Clause 9.1.5.2.5	Represents the topological and geographic areas.	EdgeApp_2
TestNotification	3GPP TS 29.122 [6]	This type represents a notification that can be sent to test whether a chosen notification mechanism works	
Uri	3GPP TS 29.122 [6]		
WebsocketNotifConfig	3GPP TS 29.122 [6]	This type represents configuration for the delivery of notifications over Websockets.	

8.6.5.2 Structured data types

8.6.5.2.1 Introduction

8.6.5.2.2 Type: AcrMgntEventsSubscription

Table 8.6.5.2.2-1: Definition of type AcrMgntEventsSubscription

Attribute name	Data type	P	Cardinality	Description	Applicability
self	Uri	C	0..1	Link to the "Individual ACR Management Events Subscription" resource. Shall only be present in the HTTP GET response on the "ACR Management Events Subscriptions" resource.	
easId	string	M	1	Contains the application identifier of the EAS (e.g. URI, FQDN).	
eventSubscs	array(AcrMgmtEventSubsc)	M	1..N	Indicates the subscribed ACR management events and the related information.	
evtReq	ReportingInformation	O	0..1	Indicates the event reporting information. (NOTE 1, NOTE 2, NOTE 3)	
notificationDestination	Uri	M	1	Contains the URI towards which the event notifications shall be delivered.	
eventReports	array(AcrMgmtEventReport)	C	1..N	Represents ACR management event report(s). This attribute shall be present in an HTTP POST response if the immediate reporting indication in the "immRep" attribute within the "evtReq" attribute sets to true in the corresponding HTTP POST request, and the report(s) are available. This attribute may be present in an HTTP PUT or PATCH response when the report(s) are available.	
availabilityInfo	AvailabilityNotification	C	0..1	Indicates the availability information of user plane path management events monitoring via the 3GPP 5GC network. This attribute may only be present in an HTTP POST/PUT/PATCH response, if the availability status information is available.	
failEventReports	array(FailureAcrMgmtEventInfo)	O	1..N	Represents the event(s) for which the subscription is not successful including the failure reason(s).	
requestTestNotification	boolean	O	0..1	Set to true by the EAS to request the EES to send a test notification as defined in 3GPP TS 29.122 [6]. Set to false or omitted otherwise.	Notification_test_event
websocketNotificationConfig	WebsocketNotificationConfig	O	0..1	Configuration parameters to set up notification delivery over WebSocket protocol as defined in 3GPP TS 29.122 [6].	Notification_websocket
supFeat	SupportedFeatures	C	0..1	Represents the list of Supported features. This attribute shall be present in the HTTP POST request if at least one feature is supported by the consumer. It shall be present in an HTTP POST response if it was provided in the corresponding HTTP POST request, or in the HTTP GET response if the "sup-feat" attribute query parameter is included in the corresponding HTTP GET request.	

- NOTE 1: The "evtReq" of an AcrMgmtEventSubsc data structure within the "eventSubscs" attribute takes precedence over the "evtReq" attribute defined in this data structure when both are present.
- NOTE 2: When the "evtReq" is not provided in an AcrMgmtEventSubsc data structure within the "eventSubscs" attribute, the "evtReq" attribute defined in this data structure applies for the corresponding ACR management event subscription.
- NOTE 3: This attribute is not applicable to neither the "ACT_START_STOP" event nor the "ACR_SELECTION" event when one of them or both of them is/are part of the subscribed event(s) within the "eventSubscs" attribute.

8.6.5.2.3 Type: AcrMgntEventSubsc

Table 8.6.5.2.3-1: Definition of type AcrMgntEventSubsc

Attribute name	Data type	P	Cardinality	Description	Applicability
event	AcrMgmtEvent	M	1	Indicates the subscribed ACR management event.	
eventFilter	AcrMgmtEventFilter	O	0..1	Represents the event filter for the subscribed ACR management event. This attribute may be provided only if the "event" attribute is set to "ACR_MONITORING".	
evtReq	ReportingInformation	O	0..1	Indicates the event reporting requirements (e.g. reporting periodicity, immediate reporting indication, etc). (NOTE 1, NOTE 2)	
tgtUeId	TargetUeIdentification	C	0..1	Contains the UE identification information. This attribute shall be provided only if the "event" attribute is set to either "UP_PATH_CHG", "ACR_MONITORING" or "ACR_FACILITATION".	
dnaiChgType	DnaiChangeType	O	0..1	Identifies a type of notification regarding UP path management event. This attribute may be provided only if the "event" attribute is set to "UP_PATH_CHG".	
easAckInd	boolean	O	0..1	Identifies whether EAS acknowledgement of UP path change event notifications is to be expected. Set to "true" if the EAS acknowledgement is expected. Set to "false" if the EAS acknowledgement is not expected. Default value is "false". This attribute may be provided only if the "event" attribute is set to "UP_PATH_CHG".	
easChars	array(EasCharacteristics)	O	1..N	Represents a list of EAS characteristics. This attribute may be provided only if the "event" attribute is set to either "ACR_MONITORING" or "ACR_FACILITATION".	
trafFilterInfo	TrafficFilterInfo	O	0..1	Represents the traffic filter information. This attribute may be present only if the "event" attribute is set to "UP_PATH_CHG", "ACR_MONITORING" and/or "ACR_FACILITATION".	EdgeApp_2

servContPlanInd	boolean	O	0..1	<p>Contains the service continuity planning indication (i.e., whether or not the EES shall monitor whether the UE(s) enter the predicted location).</p> <ul style="list-style-type: none"> - When set to "true", it indicates that service continuity planning is required. - When set to "false", it indicates that service continuity planning is not required. - The default value when this attribute is omitted is false. <p>This attribute may be present only when the "event" attribute is set to "ACR_MONITORING" or "ACR_FACILITATION".</p>	EdgeApp_2
easAckSvcCont	boolean	O	0..1	<p>Indicates Whether the EAS will provide an acknowledgement as a response to the notification of ACR management notification related to service continuity planning.</p> <ul style="list-style-type: none"> - When set to "true", it indicates that the EAS acknowledgement is expected. - When set to "false", it indicates the EAS acknowledgement is not expected. - The default value is "false", when this attribute is omitted. <p>This attribute may be present only if the "event" attribute is set to "ACR_MONITORING" or "ACR_FACILITATION".</p>	EdgeApp_2
<p>NOTE 1: The "evtReq" takes precedence over the "evtReq" attribute of the AcrMgntEventsSubscription data structure when both are present.</p> <p>NOTE 2: This attribute shall not be present when the "event" attribute is set to "ACT_START_STOP" or "ACR_SELECTION".</p>					

8.6.5.2.4 Type: AcrMgntEventsSubscriptionPatch

Table 8.6.5.2.4-1: Definition of type AcrMgntEventsSubscriptionPatch

Attribute name	Data type	P	Cardinality	Description	Applicability
eventSubscs	array(AcrMgntEventSubsc)	O	1..N	Indicates the subscribed ACR management events.	
evtReq	ReportingInformation	O	0..1	Indicates the event reporting information. (NOTE)	
notificationDestination	Uri	O	0..1	URI where the event notification shall be delivered to.	
<p>NOTE: This attribute is not applicable to neither the "ACT_START_STOP" event nor the "ACR_SELECTION" event when one of them or both or them is/are part of the existing or newly subscribed event(s) within the "eventSubscs" attribute.</p>					

8.6.5.2.5 Type: AcrMgntEventsNotification

Table 8.6.5.2.5-1: Definition of type AcrMgntEventsNotification

Attribute name	Data type	P	Cardinality	Description	Applicability
subpld	string	M	1	String identifying the Individual ACR Management Events Subscription to which the notification is related.	
eventReports	array(AcrMgntEventReport)	M	1..N	Represents a list of ACR management event `report(s).	

8.6.5.2.6 Type: AcrMgntEventReport

Table 8.6.5.2.6-1: Definition of type AcrMgntEventReport

Attribute name	Data type	P	Cardinality	Description	Applicability
event	AcrMgntEvent	M	1	Indicates the subscribed ACR management event.	
timeStamp	DateTime	O	0..1	Represents the time stamp of the detected event.	
easEndPoint	EndPoint	C	0..1	Represents the endpoint information of the EAS. This attribute shall be provided either: <ul style="list-style-type: none"> - when the "event" attribute is set to either "ACR_MONITORING" or "ACR_FACILITATION". In such case, it shall contain the endpoint information of the T-EAS; or - when the "event" attribute is set to "ACT_START_STOP". In such case, it shall contain the endpoint information of the EAS to/from which the ACT needs to be started/stopped. 	
actStatus	ActStatus	C	0..1	Represents the reported ACT status, i.e. ACT start or ACT stop. This attribute shall be provided only when the "event" attribute is set to "ACT_START_STOP".	
acId	string	C	0..1	Represents the identifier of the concerned AC. This attribute shall be present only when the "event" attribute is set to "ACT_START_STOP", or when the "EdgeApp_2" feature is supported, "ACR_SELECTION".	
ueId	TargetUeIdentification	C	0..1	Represents the identifier of the UE. This attribute shall be present only when the "event" attribute is set to "ACT_START_STOP" or "ACR_SELECTION". (NOTE)	EdgeApp_2
selACRScen	array(SelectedACRScenarios)	C	1..N	Represents the selected ACR scenario(s) for a given combination of AC and UE. This attribute shall be provided only when the "event" attribute is set to "ACR_SELECTION".	EdgeApp_2
easInBdlInfoList	array(EasInBundleInfo)	C	1..N	Represents the list of EAS in a bundle related information. This attribute shall be provided only when the "event" attribute is set to "ACR_SELECTION".	EdgeApp_2
acrParams	ACRParameters	O	0..1	Represents the ACR Parameters. This attribute may be present only when the "actStatus" attribute is present and set to "ACT_START".	EdgeApp_2
upPathChgInfo	UpPathChangeInfo	C	0..1	Represents the UP Path change information. This attribute shall be provided when the "event" attribute is set to "UP_PATH_CHG".	

servContPlanInd	boolean	O	0..1	<p>Contains the service continuity planning indication (i.e., whether or not the EES shall monitor whether the UE(s) enter the predicted location or not).</p> <ul style="list-style-type: none"> - When set to "true", it indicates that service continuity planning shall be performed. - When set to "false", it indicates that service continuity planning shall not be performed. - The default value when this attribute is omitted is false. <p>This attribute may be present only when the "event" attribute is set to "ACT_START_STOP".</p>	EdgeApp_2
<p>NOTE: Only the GPSI, within the "gpsi" attribute, or the Edge UE ID, within the "edgeUeld" attribute, are applicable for this attribute as it shall convey the identifier of a single UE.</p>					

8.6.5.2.7 Type: FailureAcrMgmtEventInfo

Table 8.6.5.2.7-1: Definition of type FailureAcrMgmtEventInfo

Attribute name	Data type	P	Cardinality	Description	Applicability
event	AcrMgmtEvent	M	1	Indicates the subscribed ACR management event.	
failureCode	AcrMgmtEventFailureCode	M	1	Identifies the failure reason.	

8.6.5.2.8 Type: TargetUeldidentification

Table 8.6.5.2.8-1: Definition of type TargetUeldidentification

Attribute name	Data type	P	Cardinality	Description	Applicability
gpsi	Gpsi	C	0..1	Represents external UE identifier. (NOTE)	
edgeUeld	string	C	0..1	Represents the Edge UE ID. (NOTE)	EdgeApp_2
intGrpId	GroupId	C	0..1	Represents a group of UEs identified by an Internal Group Identifier. (NOTE)	
extGrpId	ExternalGroupId	C	0..1	Represents a group of UEs identified by an External Group Identifier. (NOTE)	
uelpAddr	IpAddr	C	0..1	Represents the UE IP address. (NOTE)	
<p>NOTE: These attributes are mutually exclusive. Either one of them shall be present.</p>					

8.6.5.2.9 Type: UpPathChangeInfo

Table 8.6.5.2.9-1: Definition of type UpPathChangeInfo

Attribute name	Data type	P	Cardinality	Description	Applicability
ueld	IndUeldentification	M	1	Contains the concerned UE's identification information.	
dnaiChgType	DnaiChangeType	M	1	Identifies the type of notification regarding UP path management event.	
sourceTrafficRoute	RouteToLocation	O	0..1	Identifies the N6 traffic routing information associated to the source DNAI.	
targetTrafficRoute	RouteToLocation	O	0..1	Identifies the N6 traffic routing information associated to the target DNAI.	
sourceDnai	Dnai	O	0..1	Source DN Access Identifier.	
targetDnai	Dnai	O	0..1	Target DN Access Identifier.	
srcUelpv4Addr	Ipv4Addr	O	0..1	The IPv4 Address of the served UE for the source DNAI.	
srcUelpv6Prefix	Ipv6Prefix	O	0..1	The Ipv6 Address Prefix of the served UE for the source DNAI.	
tgtUelpv4Addr	Ipv4Addr	O	0..1	The IPv4 Address of the served UE for the target DNAI.	
tgtUelpv6Prefix	Ipv6Prefix	O	0..1	The Ipv6 Address Prefix of the served UE for the target DNAI.	

8.6.5.2.10 Type: IndUeldentification

Table 8.6.5.2.10-1: Definition of type IndUeldentification

Attribute name	Data type	P	Cardinality	Description	Applicability
gpsi	Gpsi	O	0..1	Represents the GPSI of the UE.	
externalId	ExternalId	O	0..1	Represents the External Identifier of the UE.	
uelpAddr	IpAddr	O	0..1	Represents the UE IP address.	
NOTE: Only one of the above attributes shall be present.					

8.6.5.2.11 Type: AvailabilityNotif

Table 8.6.5.2.11-1: Definition of type AvailabilityNotif

Attribute name	Data type	P	Cardinality	Description	Applicability
availabilityStatus	AvailabilityStatus	M	1	Indicates the availability information of user plane path management events monitoring via the 3GPP 5GC network.	

8.6.5.2.12 Type: SelectedACRScenarios

Table 8.6.5.2.12-1: Definition of type SelectedACRScenarios

Attribute name	Data type	P	Cardinality	Description	Applicability
acrList	array(ACRScenario)	M	0..N	Indicates the list of selected ACR scenario(s) for the combination of AC (identified by the "acld" attribute) and UE (identified by the "ueld" attribute). If no ACR scenario applies, an empty array is provided within this attribute.	
acld	string	M	1	The identifier of the AC for which the selected ACR scenario(s) provided within the "acrList" attribute apply.	
ueld	Gpsi	M	1	Represents identifier of the UE for which the selected ACR scenario(s) provided within the "acrList" attribute apply.	

8.6.5.2.13 Type: ACRParameters

Table 8.6.5.2.13-1: Definition of type ACRParameters

Attribute name	Data type	P	Cardinality	Description	Applicability
predictExpTime	DateTime	O	0..1	The estimated time at which the UE may reach the Predicted/Expected UE location or EAS service area at the latest.	

8.6.5.2.14 Type: TrafficFilterInfo

Table 8.6.5.2.14-1: Definition of type TrafficFilterInfo

Attribute name	Data type	P	Cardinality	Description	Applicability
ipFlows	array(string)	C	1..N	Represents a 3-tuple with protocol, server ip and server port for UL/DL application traffic. The content of the string has the same encoding as the IPFilterRule AVP value as defined in IETF RFC 6733 [25]. (NOTE)	
uris	array(string)	C	1..N	Indicates URI(s) matching criteria. (NOTE)	
domainNames	array(string)	C	1..N	Indicates domain name(s) matching criteria. (NOTE)	
dnProtocol	DomainNameProtocol	C	0..1	Indicates the additional protocol and protocol field for domain names to be matched. This attribute may only be provided when "domainNames" attribute is present.	
NOTE: At least one of these attributes shall be present. If more than one of these attributes are present, the traffic flow is matched only when every provided attribute has a matching value.					

8.6.5.2.15 Type: EasAckInformation

Table 8.6.5.2.15-1: Definition of type EasAckInformation

Attribute name	Data type	P	Cardinality	Description	Applicability
resCode	ResultCode	M	1	Indicates the acceptance or rejection of the ACT.	

8.6.5.2.16 Type: EasInBundleInfo

Table 8.6.5.2.16-1: Definition of type EasInBundleInfo

Attribute name	Data type	P	Cardinality	Description	Applicability
easId	string	M	1	Contains the identifier of the EAS that is within an EAS bundle.	
dnais	array(Dnai)	O	1..N	Contains the List of DNAI(s) associated with the EAS.	
svcArea	ServiceArea	O	0..1	Contains the list of geographical and/or topological area(s) that the EAS serves.	

8.6.5.3 Simple data types and enumerations

8.6.5.3.1 Introduction

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

8.6.5.3.2 Simple data types

The simple data types defined in table 8.6.5.3.2-1 shall be supported.

Table 8.6.5.3.2-1: Simple data types

Type Name	Type Definition	Description	Applicability

8.6.5.3.3 Enumeration: AcrMgntEvent

Table 8.6.5.3.3-1: Enumeration AcrMgntEvent

Enumeration value	Description	Applicability
UP_PATH_CHG	Indicates that the ACR Management Event is user plane path change.	
ACR_MONITORING	Indicates that the ACR Management Event is ACR monitoring.	
ACR_FACILITATION	Indicates that the ACR Management Event is ACR facilitation.	
ACT_START_STOP	Indicates that the ACR Management Event is ACT start/stop.	
ACR_SELECTION	Indicates that the ACR Management Event is ACR selection.	EdgeApp_2

8.6.5.3.4 Enumeration: AcrMgntEventFilter

Table 8.6.5.3.4-1: Enumeration AcrMgntEventFilter

Enumeration value	Description	Applicability
INTRA_EDN_MOBILITY	Indicates that the ACR Management Event filter is intra-EDN mobility.	
INTER_EDN_MOBILITY	Indicates that the ACR Management Event filter is inter-EDN mobility.	

8.6.5.3.5 Enumeration: ActStatus

Table 8.6.5.3.5-1: Enumeration ActStatus

Enumeration value	Description	Applicability
ACT_START	Indicates ACT start.	
ACT_STOP	Indicates ACT stop.	

8.6.5.3.6 Enumeration: AcrMgntEventFailureCode

Table 8.6.5.3.6-1: Enumeration AcrMgntEventFailureCode

Enumeration value	Description	Applicability
3GPP_UP_PATH_CHANGE_MON_NOT_AVAILABLE	Indicates that the ACR Management Event Subscription failed because user plane path management event notifications from the 3GPP network is NOT available. This value is only applicable for the "UP_PATH_CHG", "ACR_MONITORING" and "ACR_FACILITATION" events.	
OTHER_REASONS	Indicates that the ACR Management Event Subscription failed for other reasons. This value is applicable for all events.	

8.6.5.3.7 Enumeration: AvailabilityStatus

Table 8.6.5.3.7-1: Enumeration AvailabilityStatus

Enumeration value	Description	Applicability
AVAILABLE	Indicates availability.	
NOT_AVAILABLE	Indicates unavailability.	

8.6.5.3.8 Enumeration: ResultCode

Table 8.6.5.3.8-1: Enumeration ResultCode

Enumeration value	Description	Applicability
ACCEPTED	Indicates acceptance of the ACT.	
REJECTED	Indicates rejection of the ACT.	

8.6.6 Error Handling

8.6.6.1 General

For the Eees_ACRManagementEvent API, HTTP error handling shall be supported as specified in clause 7.7. In addition, the requirements in the following clauses are applicable for the Eees_ACRManagementEvent API.

8.6.6.2 Protocol Errors

No specific protocol errors for the Eees_ACRManagementEvent API are specified.

8.6.6.3 Application Errors

The application errors defined for the Eees_ACRManagementEvent API are listed in Table 8.6.6.3-1.

Table 8.6.6.3-1: Application errors

Application Error	HTTP status code	Description	Applicability
PFD_MNGT_NOT_SUPPORTED	403 Forbidden	Indicates that the ACR Management Events Subscription creation/update is rejected because PFD Management is needed to fulfill the request but it is not supported by the 3GPP network.	EdgeApp_2

8.6.7 Feature negotiation

General feature negotiation procedures are defined in clause 7.8. Table 8.6.7-1 lists the supported features for Eees_ACRManagementEvent API.

Table 8.6.7-1: Supported Features

Feature number	Feature Name	Description
1	Notification_test_event	Testing of notification connection is supported according to clause 7.6.
2	Notification_websocket	The delivery of notifications over Websocket is supported according to clause 7.6. This feature requires that the Notification_test_event feature is also supported.
3	EdgeApp_2	This feature indicates the support of the enhancements to the Edge Applications. Within this feature the following enhancements are covered: <ul style="list-style-type: none"> - Support of the "ACR Selection" event reporting. - Support of additional ACT Start/Stop event related information. - Support of the service continuity planning support indication. - Support of the EAS acknowledgement for service continuity planning indication. - Support of EAS bundle information reporting. - Support of the Edge UE ID as a possible UE ID.

8.7 Eees_EECContextRelocation API

8.7.1 API URI

The Eees_EECContextRelocation service shall use the Eees_EECContextRelocation API.

The request URIs used in HTTP requests shall have the Resource URI structure as defined in clause 7.5 with the following clarifications:

- The <apiName> shall be "ees-eecontextreloc".
- The <apiVersion> shall be "v1".

- The <apiSpecificResourceUriPart> shall be set as described in clause 8.7.2.

8.7.1A Usage of HTTP

The provisions of clause 5.2.2 of 3GPP TS 29.122 [6] shall apply for the Eees_EECContextRelocation API.

8.7.2 Resources

8.7.2.1 Overview

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

Figure 8.7.2.1-1 depicts the resource URIs structure for the Eees_EECContextRelocation API.

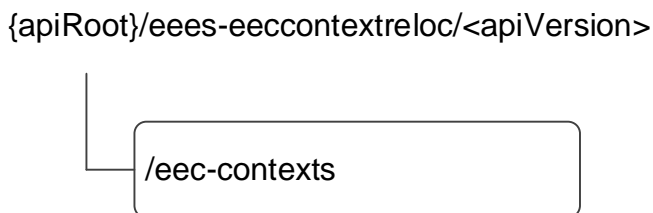


Figure 8.7.2.1-1: Resource URI structure of the Eees_EECContextRelocation API

Table 8.7.2.1-1 provides an overview of the resources and applicable HTTP methods.

Table 8.7.2.1-1: Resources and methods overview

Resource name	Resource URI	HTTP method or custom operation	Description
EEC Contexts	/eec-contexts	GET	Pull the EEC Context information.
		POST	Push the EEC Context information.

8.7.2.2 Resource: EEC Contexts

8.7.2.2.1 Description

This resource represents the collection of EEC Contexts managed by the EES.

8.7.2.2.2 Resource Definition

Resource URI: `{apiRoot}/ees-eecontextreloc/<apiVersion>/eec-contexts`

This resource shall support the resource URI variables defined in the table 8.7.2.2.2-1.

Table 8.7.2.2.2-1: Resource URI variables for this resource

Name	Data Type	Definition
apiRoot	string	See clause 7.5

8.7.2.2.3 Resource Standard Methods

8.7.2.2.3.1 GET

This method allows a service consumer to pull the EEC Context information from the EES.

This method shall support the URI query parameters specified in table 8.7.2.2.3.1-1.

Table 8.7.2.2.3.1-1: URI query parameters supported by the GET method on this resource

Name	Data type	P	Cardinality	Description
ees-id	string	M	1	The identifier of the requesting entity (e.g., T-EES, CES).
eec-cntx-id	string	M	1	Unique identifier of the EEC Context to authorize the transfer.
sess-cntxs	SessionContexts	O	0..1	List of service session context information being requested. (NOTE)
NOTE: Within each array element of the "sessCntxs" attribute (encoded using the IndividualSessionContext data structure) provided within this query parameter, the "aclId" and "acrList" attributes shall not be applicable.				

This method shall support the request data structures specified in table 8.7.2.2.3.1-2 and the response data structures and response codes specified in table 8.7.2.2.3.1-3.

Table 8.7.2.2.3.1-2: Data structures supported by the GET Request Body on this resource

Data type	P	Cardinality	Description
n/a			

Table 8.7.2.2.3.1-3: Data structures supported by the GET Response Body on this resource

Data type	P	Cardinality	Response codes	Description
EEContext	M	1	200 OK	Successful case. The EEC context information matching the query parameters in the request is returned.
NOTE: The mandatory HTTP error status codes for the HTTP GET method listed in Table 5.2.6-1 of 3GPP TS 29.122 [6] shall also apply.				

8.7.2.2.3.2 POST

This method allows a service consumer to push the EEC Context to the EES.

This method shall support the URI query parameters specified in table 8.7.2.2.3.2-1.

Table 8.7.2.2.3.2-1: URI query parameters supported by the POST method on this resource

Name	Data type	P	Cardinality	Description
n/a				

This method shall support the request data structures specified in table 8.7.2.2.3.2-2 and the response data structures and response codes specified in table 8.7.2.2.3.2-3.

Table 8.7.2.2.3.2-2: Data structures supported by the POST Request Body on this resource

Data type	P	Cardinality	Description
EEContextPush	M	1	Represents the EEC Context information to be pushed.

Table 8.7.2.3.2-3: Data structures supported by the POST Response Body on this resource

Data type	P	Cardinality	Response codes	Description
n/a			204 No Content	Successful case. The EEC context information is successfully pushed to the EES, and no content is returned in the response body.
EECContextPush Res	M	1	200 OK	Successful case. The EEC context information is successfully pushed to the EES and related information is returned in the response body.
NOTE: The mandatory HTTP error status codes for the HTTP POST method listed in Table 5.2.6-1 of 3GPP TS 29.122 [6] shall also apply.				

8.7.2.2.4 Resource Custom Operations

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

8.7.3 Custom Operations without associated resources

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

8.7.4 Notifications

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

8.7.5 Data Model

8.7.5.1 General

This clause specifies the application data model supported by the API. Data types listed in clause 7.2 apply to this API

Table 8.7.5.1-1 specifies the data types defined specifically for the Eees_EECContextRelocation API service.

Table 8.7.5.1-1: Eees_EECContextRelocation API specific Data Types

Data type	Section defined	Description	Applicability
EECContext	8.7.5.2.5	To represent the EEC context information to be relocated.	
EECContextPush	8.7.5.2.4	To represent the EEC context information to be pushed.	
EECContextPushRes	8.7.5.2.6	Represents the EEC context push relocation response.	
EECSrvContinuitySupport	8.7.5.2.8	Represents the EEC service continuity support and the supported ACR scenarios.	
ImplicitRegDetails	8.7.5.2.7	Represents the EEC implicit registration information.	
IndividualSessionContext	8.7.5.2.3	To represent single Service session context information.	
SessionContexts	8.7.5.2.2	To represent the Service session contexts information in the EEC context pull request.	

Table 8.7.5.1-2 specifies data types re-used by the Eees_EECContextRelocation API from other specifications, including a reference to their respective specifications and when needed, a short description of their use within the Eees_EECContextRelocation API.

Table 8.7.5.1-2: Eees_EECContextRelocation API re-used Data Types

Data type	Reference	Comments	Applicability
EndPoint	8.1.5.2.5	To represent the end point information of an entity.	
ACProfile	3GPP TS 24.558 [14]	Represents the application clients profiles in EEC context.	
ACRScenario	9.1.5.3.3	Represents the ACR scenarios.	EdgeApp_2
Gpsi	3GPP TS 29.571 [8]	Represents the identifier of a UE in GPSI format.	
LocationArea5G	3GPP TS 29.122 [6]	Represents the location information of the UE in the EEC context.	
DateTime	3GPP TS 29.122 [6]	Represents a date and a time.	

8.7.5.2 Structured data types

8.7.5.2.1 Introduction

The data type for the Eees_EECContextRelocation API are defined in the clauses below.

8.7.5.2.2 Type: SessionContexts

Table 8.7.5.2.2-1: Definition of type SessionContexts

Attribute name	Data type	P	Cardinality	Description	Applicability
sessCntxs	array(IndividualSessionContext)	M	1..N	Contains the list of service session context information.	

8.7.5.2.3 Type: IndividualSessionContext

Table 8.7.5.2.3-1: Definition of type IndividualSessionContext

Attribute name	Data type	P	Cardinality	Description	Applicability
easId	string	M	1	Contains the application identifier (e.g., URI, FQDN) of the Application Server (e.g., EAS, CAS) providing the application services.	
endPt	EndPoint	M	1	Contains the end point information of the Application Server provided within the "easId" attribute.	
acId	string	O	0..1	Contains the identifier of the AC for which the service session information is provided.	
acrList	array(ACR scenario)	O	1..N	Contains the list of the selected ACR scenario(s).	EdgeApp_2
eeId	string	O	0..1	Contains the identifier of the EEC.	enNB1

8.7.5.2.4 Type: EEContextPush

Table 8.7.5.2.4-1: Definition of type EEContextPush

Attribute name	Data type	P	Cardinality	Description	Applicability
eesId	string	M	1	Contains the identifier of the requesting entity (e.g., S-EES, CES) pushing the EEC context.	
eecCntx	EEContext	M	1	Contains the EEC Context to be relocated.	
tgtEas	EndPoint	O	0..1	Contains the endpoint information of the selected Application Server (e.g., T-EAS, CAS).	EdgeApp_2
acrScenariosSelReq	boolean	O	0..1	Contains the ACR scenarios selection request. <ul style="list-style-type: none"> - When set to "true", this attribute indicates to the EES to select the ACR scenarios list. - When set to "false", this attribute indicates to the EES not to select the ACR scenarios list. - The default value when this attribute is omitted is "false". 	EdgeApp_2

8.7.5.2.5 Type: EEContext

Table 8.7.5.2.5-1: Definition of type EEContext

Attribute name	Data type	P	Cardinality	Description	Applicability
eeclId	string	M	1	Contains the unique identifier of the EEC	
cntxId	string	M	1	Contains the unique identifier assigned to the EEC Context	
ueId	Gpsi	O	0..1	Contains the identifier of the UE hosting the EEC.	
e1Subs	array(string)	O	1..N	Contains the list of subscription IDs for the capability exposure for the EEC ID.	
ueLoc	LocationArea5G	O	0..1	Contains the latest available location information of the UE hosting the EEC.	
acProfs	array(ACProfile)	O	1..N	Contains the list of ACs profiles.	
sessCntxs	SessionContexts	O	0..1	Contains the list of associated Service Session Contexts. (NOTE)	
eecSrvContSupp	EECSrvContextSupport	O	0..1	Represents the service continuity support related information.	EdgeApp_2
ueMobSupportInd	boolean	O	0..1	Contains the UE Mobility Support indication. <ul style="list-style-type: none"> - When set to "true", this attribute indicates that UE Mobility Support is required. - When set to "false" or omitted, this attribute indicates that UE Mobility Support is not required. - The default value when this attribute is omitted is "false". 	EdgeApp_2
NOTE:	Within each array element of the "sessCntxs" attribute (encoded using the IndividualSessionContext data structure) provided within this attribute, the "eeclId" attribute shall not be applicable.				

8.7.5.2.6 Type: EECContextPushRes

Table 8.7.5.2.6-1: Definition of type EECContextPushRes

Attribute name	Data type	P	Cardinality	Description	Applicability
implReg	ImplicitRegDetails	C	0..1	Contains implicit registration details. (NOTE)	
selAcrScenariosList	array(ACRS scenario)	O	1..N	Contains the list of ACR scenarios selected by the EES.	EdgeApp_2
NOTE: This attribute shall be included if the EES has performed implicit registration of the EEC.					

8.7.5.2.7 Type: ImplicitRegDetails

Table 8.7.5.2.7-1: Definition of type ImplicitRegDetails

Attribute name	Data type	P	Cardinality	Description	Applicability
regId	string	M	1	Represents the registration ID of the EEC whose EEC context is pushed	
expTime	DateTime	O	0..1	Represents the expiration time of the registration. If absent, then it indicates that the registration of the EEC never expires.	

8.7.5.2.8 Type: EECSrvContinuitySupport

Table 8.7.5.2.8-1: Definition of type EECSrvContinuitySupport

Attribute name	Data type	P	Cardinality	Description	Applicability
srvContSupp	boolean	M	1	This attribute is to indicate EEC service continuity support. When set to "true", this attribute indicates EEC supports service continuity. When set to "false", this attribute indicates EEC does not support service continuity. The default value when omitted is "false".	
acrScenarios	array(ACRS scenario)	C	1..N	This attribute indicates the list of ACR scenarios supported by the EEC. This attribute shall be present only when the "srvContSupp" attribute is set to "true".	

8.7.5.3 Simple data types and enumerations

8.7.5.3.1 Introduction

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

8.7.5.3.2 Simple data types

The simple data types defined in table 8.7.5.3.2-1 shall be supported.

Table 8.7.5.3.2-1: Simple data types

Type Name	Type Definition	Description	Applicability

8.7.5.4 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.

8.7.5.5 Binary data

8.7.5.5.1 Binary Data Types

Table 8.7.5.5.1-1: Binary Data Types

Name	Clause defined	Content type

8.7.6 Error Handling

8.7.6.1 General

For the Eees_EECContextRelocation API, HTTP error responses shall be supported as specified in clause 5.2.6 of 3GPP TS 29.122 [6]. Protocol errors and application errors specified in clause 5.2.6 of 3GPP TS 29.122 [6] shall be supported for the HTTP status codes specified in table 5.2.6-1 of 3GPP TS 29.122 [6].

In addition, the requirements in the following clauses are applicable for the Eees_EECContextRelocation API.

8.7.6.2 Protocol Errors

No specific protocol errors for the Eees_EECContextRelocation API are specified.

8.7.6.3 Application Errors

The application errors defined for the Eees_EECContextRelocation API are listed in Table 8.7.6.3-1.

Table 8.7.6.3-1: Application errors

Application Error	HTTP status code	Description	Applicability

8.7.7 Feature negotiation

General feature negotiation procedures are defined in clause 7.8. Table 8.7.7-1 lists the supported features for Eees_EECContextRelocation API.

Table 8.7.7-1: Supported Features

Feature number	Feature Name	Description
1	EdgeApp_2	This feature indicates the support of the phase 2 of the definition of EDGE applications support. Within this feature, the following enhancements are covered: - Support the "ACR Selection" event subscription and reporting.
2	enNB1	This feature indicates the support of the enhancements of this application layer API. Within this feature, the following enhancements are covered: - Support the the EEC ID within the IndividualSessionContext data type.

8.8 Eees_EELManagedACR API

8.8.1 Introduction

The Eees_EELManagedACR service shall use the Eees_EELManagedACR API.

The API URI of the Eees_EELManagedACR 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 [6], 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 [6].
- The <apiName> shall be "ees-eel-acr".
- The <apiVersion> shall be "v1".
- The <apiSpecificSuffixes> shall be set as described in clause 5.2.4 of 3GPP TS 29.122 [6].

8.8.2 Usage of HTTP

The provisions of clause 5.2.2 of 3GPP TS 29.122 [6] shall apply for the Eees_EELManagedACR API.

8.8.3 Resources

8.8.3.1 Overview

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

Figure 8.8.3.1-1 depicts the resource URIs structure for the Eees_EELManagedACR API.

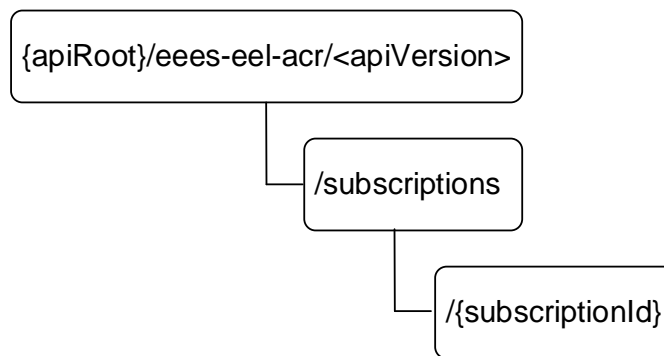


Figure 8.8.3.1-1: Resource URIs structure of the Eees_EELManagedACR API

Table 8.8.3.1-1 provides an overview of the resources and applicable HTTP methods for the Eees_EELManagedACR API.

Table 8.8.3.1-1: Resources and methods overview

Resource name	Resource URI	HTTP method or custom operation	Description
ACT Status Subscriptions	/subscriptions	GET	Retrieve all the active ACT Status Subscription resources managed by the EES.
		POST	Request the creation of a subscription to ACT status reporting during an EEL Managed ACR.
Individual ACT Status Subscription	/subscriptions/{subscriptionId}	GET	Retrieve an Individual ACT Status Subscription resource identified by the provided subscription identifier.

8.8.3.2 Resource: ACT Status Subscriptions

8.8.3.2.1 Description

This resource represents the collection of ACT Status Subscriptions managed by the EES.

8.8.3.2.2 Resource Definition

Resource URI: **{apiRoot}/ees-eel-acr/<apiVersion>/subscriptions**

This resource shall support the resource URI variables defined in table 8.8.3.2.2-1.

Table 8.8.3.2.2-1: Resource URI variables for this resource

Name	Data type	Definition
apiRoot	string	See clause 5.2.4 of 3GPP TS 29.122 [6].

8.8.3.2.3 Resource Standard Methods

The following clauses specify the standard methods supported by the resource.

8.8.3.2.3.1 GET

The GET method allows a service consumer to retrieve all the active ACT Status Subscriptions managed by the EES. This method shall support the URI query parameters specified in table 8.8.3.2.3.1-1.

Table 8.8.3.2.3.1-1: 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 8.8.3.2.3.1-2 and the response data structures and response codes specified in table 8.8.3.2.3.1-3.

Table 8.8.3.2.3.1-2: Data structures supported by the GET Request Body on this resource

Data type	P	Cardinality	Description
n/a			

Table 8.8.3.2.3.1-3: Data structures supported by the GET Response Body on this resource

Data type	P	Cardinality	Response codes	Description
array(ACTStatusSubsc)	M	0..N	200 OK	Successful case. All the active ACT Status Subscriptions managed by the EES are 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 EES. Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [6].
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 EES. Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [6].
NOTE: The mandatory HTTP error status code for the HTTP GET method listed in table 5.2.6-1 of 3GPP TS 29.122 [6] also apply.				

Table 8.8.3.2.3.1-4: Headers supported by the 307 Response Code on this resource

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

Table 8.8.3.2.3.1-5: Headers supported by the 308 Response Code on this resource

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

8.8.3.2.3.2 POST

The POST method allows a service consumer (i.e. T-EAS) to request the creation of a subscription to ACT status reporting at the EES (i.e. T-EES). This method shall support the URI query parameters specified in table 8.8.3.2.3.2-1.

Table 8.8.3.2.3.2-1: 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 8.8.3.2.3.2-2 and the response data structures and response codes specified in table 8.8.3.2.3.2-3.

Table 8.8.3.2.3.2-2: Data structures supported by the POST Request Body on this resource

Data type	P	Cardinality	Description
ACTStatusSubsc	M	1	Represents the parameters to request the creation of a subscription to ACT status reporting.

Table 8.8.3.2.3.2-3: Data structures supported by the POST Response Body on this resource

Data type	P	Cardinality	Response codes	Description
ACTStatusSubsc	M	1	201 Created	Successful case. The subscription is successfully created and a representation of the created Individual ACT Status Subscription resource is returned. An HTTP "Location" header that contains the resource URI of the created Individual ACT Status Subscription resource shall also be included.
NOTE: The mandatory HTTP error status code for the HTTP POST method listed in table 5.2.6-1 of 3GPP TS 29.122 [6] also apply.				

Table 8.8.3.2.3.2-4: 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}/eees-eel-act/<apiVersion>/subscriptions/{subscriptionId}

8.8.3.2.4 Resource Custom Operations

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

8.8.3.3 Resource: Individual ACT Status Subscription

8.8.3.3.1 Description

This resource represents an Individual ACT Status subscription managed by the EES.

8.8.3.3.2 Resource Definition

Resource URI: {apiRoot}/eees-eel-act/<apiVersion>/subscriptions/{subscriptionId}

This resource shall support the resource URI variables defined in table 8.8.3.3.2-1.

Table 8.8.3.3.2-1: Resource URI variables for this resource

Name	Data type	Definition
apiRoot	string	See clause 5.2.4 of 3GPP TS 29.122 [6].
subscriptionId	string	Represents the subscription identifier.

8.8.3.3.3 Resource Standard Methods

The following clauses specify the standard methods supported by the resource.

8.8.3.3.3.1 GET

The GET method allows a service consumer to retrieve an ACT 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 8.8.3.3.3.1-1.

Table 8.8.3.3.3.1-1: 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 8.8.3.3.3.1-2 and the response data structures and response codes specified in table 8.8.3.3.3.1-3.

Table 8.8.3.3.3.1-2: Data structures supported by the GET Request Body on this resource

Data type	P	Cardinality	Description
n/a			

Table 8.8.3.3.3.1-3: Data structures supported by the GET Response Body on this resource

Data type	P	Cardinality	Response codes	Description
ACTStatusSubsc	M	1	200 OK	Successful case. The requested Individual ACT Status Subscription resource is 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 EES. Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [6].
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 EES. Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [6].
NOTE: The mandatory HTTP error status code for the HTTP GET method listed in table 5.2.6-1 of 3GPP TS 29.122 [6] also apply.				

Table 8.8.3.3.3.1-4: Headers supported by the 307 Response Code on this resource

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

Table 8.8.3.3.3.1-5: Headers supported by the 308 Response Code on this resource

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

8.8.3.3.4 Resource Custom Operations

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

8.8.4 Custom Operations without associated resources

8.8.4.1 Overview

The structure of the custom operation URIs of the Eees_EELManagedACR API is shown in Figure 8.8.4.1-1.

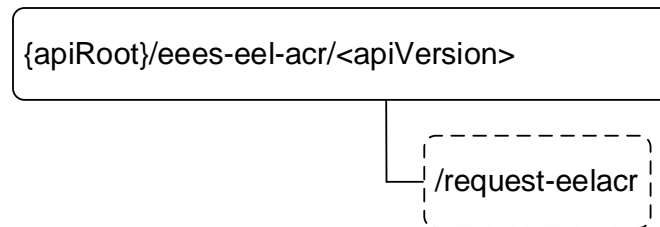


Figure 8.8.4.1-1: Custom operation URI structure of the Eees_EELManagedACR API

Table 8.8.4.1-1 provides an overview of the custom operations and applicable HTTP methods defined for the Eees_EELManagedACR API.

Table 8.8.4.1-1: Custom operations without associated resources

Operation name	Custom operation URI	Mapped HTTP method	Description
RequestEELManagedACR	/request-eelacr	POST	Enables a service consumer (i.e. S-EAS) to request the EES (i.e. S-EES) to handle all the operations of an ACR.

8.8.4.2 Operation: RequestEELManagedACR

8.8.4.2.1 Description

The custom operation enables a service consumer (i.e. S-EAS) to request the EES (i.e. S-EES) to handle all the operations of an ACR.

8.8.4.2.2 Operation Definition

This operation shall support the request data structures and the response data structures and response codes specified in tables 8.8.4.2.2-1 and 8.8.4.2.2-2.

Table 8.8.4.2.2-1: Data structures supported by the POST Request Body on this resource

Data type	P	Cardinality	Description
EELACRReq	M	1	Parameters to request the EES (i.e. S-EES) to handle all the operations of an ACR.

Table 8.8.4.2.2-2: Data structures supported by the POST Response Body on this resource

Data type	P	Cardinality	Response codes	Description
EELACRResp	M	1	200 OK	The requested EEL Managed ACR initiation was successfully received and processed. The response body contains the feedback of the EES.
n/a			307 Temporary Redirect	Temporary redirection. The response shall include a Location header field containing an alternative target URI located in an alternative EES. Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [6].
n/a			308 Permanent Redirect	Permanent redirection. The response shall include a Location header field containing an alternative target URI located in an alternative EES. Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [6].

NOTE: The mandatory HTTP error status code for the HTTP POST method listed in Table 5.2.6-1 of 3GPP TS 29.122 [6] also apply.

Table 8.8.4.2.2-3: Headers supported by the 307 Response Code on this resource

Name	Data type	P	Cardinality	Description
Location	string	M	1	An alternative target URI located in an alternative EES.

Table 8.8.4.2.2-4: Headers supported by the 308 Response Code on this resource

Name	Data type	P	Cardinality	Description
Location	string	M	1	An alternative target URI located in an alternative EES.

8.8.5 Notifications

8.8.5.1 General

Notifications shall comply to clause 5.2.5 of 3GPP TS 29.122 [6].

Table 8.8.5.1-1: Notifications overview

Notification	Callback URI	HTTP method or custom operation	Description (service operation)
ACT Status Notification	{notificationUri}/act-status	act-status (POST)	This service operation enables an EES to notify a previously subscribed a service consumer (i.e. EAS) on ACT status information.

8.8.5.2 ACT Status Notification

8.8.5.2.1 Description

The ACT Status Notification is used by an EES to notify a previously subscribed service consumer (i.e. EAS) on ACT status information.

8.8.5.2.2 Target URI

The Callback URI "{notificationUri}/act-status" shall be used with the callback URI variables defined in table 8.8.5.2.2-1.

Table 8.8.5.2.2-1: Callback URI variables

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

8.8.5.2.3 Standard Methods

8.8.5.2.3.1 POST

This method shall support the request data structures specified in table 8.8.5.2.3.1-1 and the response data structures and response codes specified in table 8.8.5.2.3.1-2.

Table 8.8.5.2.3.1-1: Data structures supported by the POST Request Body

Data type	P	Cardinality	Description
ACTStatusNotif	M	1	Represents an ACT status notification.

Table 8.8.5.2.3.1-2: Data structures supported by the POST Response Body

Data type	P	Cardinality	Response codes	Description
n/a			204 No Content	Successful case. The ACT 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 EAS where the notification should be sent. Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [6].
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 EAS where the notification should be sent. Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [6].
NOTE: The mandatory HTTP error status codes for the POST method listed in Table 5.2.6-1 of 3GPP TS 29.122 [6] also apply.				

Table 8.8.5.2.3.1-3: Headers supported by the 307 Response Code on this resource

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

Table 8.8.5.2.3.1-4: Headers supported by the 308 Response Code on this resource

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

8.8.6 Data Model

8.8.6.1 General

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

Table 8.8.6.1-1 specifies the data types defined for the Eees_EELManagedACR API.

Table 8.8.6.1-1: Eees_EELManagedACR API specific Data Types

Data type	Clause defined	Description	Applicability
EELACRReq	8.8.6.2.2	Represents the parameters to request the EES (e.g. S-EES) to handle all the operations of an ACR.	
EELACRResp	8.8.6.2.3	Represents the feedback of the EES on EEL Managed ACR request.	
ACTStatusSubsc	8.8.6.2.4	Represents the parameters to request the creation of a subscription to ACT status reporting.	
ACTStatusNotif	8.8.6.2.5	Represents an ACT status notification.	

Table 8.8.6.1-2 specifies data types re-used by the Eees_EELManagedACR API from other specifications, including a reference to their respective specifications and when needed, a short description of their use within the Eees_EELManagedACR API.

Table 8.8.6.1-2: Eees_EELManagedACR API re-used Data Types

Data type	Reference	Comments	Applicability
ACTResult	Clause 8.11.6.3.3	Represents the result of ACT.	
EasCharacteristics	3GPP TS 24.558 [14]	Represents the EAS characteristics.	
Gpsi	3GPP TS 29.571 [8]	Represents the identifier of a UE.	
SupportedFeatures	3GPP TS 29.571 [8]	Used to negotiate the applicability of the optional features.	
Uri	3GPP TS 29.122 [6]	Represents a URI.	

8.8.6.2 Structured data types

8.8.6.2.1 Introduction

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

8.8.6.2.2 Type: EELACRReq

Table 8.8.6.2.2-1: Definition of type EELACRReq

Attribute name	Data type	P	Cardinality	Description	Applicability
ueId	Gpsi	M	1	Contains the UE identifier in the form of a GPSI.	
easCharacs	array(EasCharacteristics)	M	1	Contains a set of EAS characteristics to be used to determine the required EASs.	
appCtxtStoreAddr	Uri	O	0..1	Contains the URI via which the Application Context can be accessed for ACT.	
suppFeat	SupportedFeatures	C	0..1	Contains the list of supported features among the ones defined in clause 8.8.8. This parameter shall be provided if at least one feature is supported by the EAS.	

8.8.6.2.3 Type: EELACRResp

Table 8.8.6.2.3-1: Definition of type EELACRResp

Attribute name	Data type	P	Cardinality	Description	Applicability
appCtxtStoreAddr	Uri	C	0..1	Contains the URI via which the Application Context can be accessed for ACT. This attribute shall be included if it was not received from the EAS in the related EEL Managed ACR request.	
suppFeat	SupportedFeatures	C	0..1	Indicates the list of negotiated supported features. This parameter shall be provided by the EES in the response to a request in which the EAS provided the list of features that it supports.	

8.8.6.2.4 Type: ACTStatusSubsc

Table 8.8.6.2.4-1: Definition of type ACTStatusSubsc

Attribute name	Data type	P	Cardinality	Description	Applicability
easId	string	M	1	Contains the application identifier of the EAS (e.g. URI, FQDN).	
notificationUri	Uri	M	1	Contains the URI via which the EAS desires to receive ACT status notifications.	
suppFeat	SupportedFeatures	C	0..1	Contains the list of supported features among the ones defined in clause 8.8.8. This parameter shall be provided if at least one feature is supported by the EAS.	

8.8.6.2.5 Type: ACTStatusNotif

Table 8.8.6.2.5-1: Definition of type ACTStatusNotif

Attribute name	Data type	P	Cardinality	Description	Applicability
subscriptionId	string	M	1	Subscription identifier.	
actStatus	ACTResult	M	1	Contains the reported ACT status.	

8.8.6.3 Simple data types and enumerations

8.8.6.3.1 Introduction

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

8.8.6.3.2 Simple data types

The simple data types defined in table 8.8.6.3.2-1 shall be supported.

Table 8.8.6.3.2-1: Simple data types

Type Name	Type Definition	Description	Applicability

8.8.6.4 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.

8.8.6.5 Binary data

8.8.6.5.1 Binary Data Types

Table 8.8.6.5.1-1: Binary Data Types

Name	Clause defined	Content type

8.8.7 Error Handling

8.8.7.1 General

For the Eees_EELManagedACR API, HTTP error responses shall be supported as specified in clause 5.2.6 of 3GPP TS 29.122 [6]. Protocol errors and application errors specified in clause 5.2.6 of 3GPP TS 29.122 [6] shall be supported for the HTTP status codes specified in table 5.2.6-1 of 3GPP TS 29.122 [6].

In addition, the requirements in the following clauses are applicable for the Eees_EELManagedACR API.

8.8.7.2 Protocol Errors

No specific protocol errors for the Eees_EELManagedACR API are specified.

8.8.7.3 Application Errors

The application errors defined for the Eees_EELManagedACR API are listed in Table 8.8.7.3-1.

Table 8.8.7.3-1: Application errors

Application Error	HTTP status code	Description

8.8.8 Feature negotiation

The optional features in table 8.8.8-1 are defined for the Eees_EELManagedACR API. They shall be negotiated using the extensibility mechanism defined in clause 5.2.7 of 3GPP TS 29.122 [6].

Table 8.8.8-1: Supported Features

Feature number	Feature Name	Description

8.9 Eees_ACRStatusUpdate API

8.9.1 Introduction

The Eees_ACRStatusUpdate service shall use the Eees_ACRStatusUpdate API.

The API URI of the Eees_ACRStatusUpdate 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 [6], 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 [6].
- The <apiName> shall be "ees-acrstatus-update".
- The <apiVersion> shall be "v1".
- The <apiSpecificSuffixes> shall be set as described in clause 5.2.4 of 3GPP TS 29.122 [6].

8.9.2 Usage of HTTP

The provisions of clause 5.2.2 of 3GPP TS 29.122 [6] shall apply for the Eees_ACRStatusUpdate API.

8.9.3 Resources

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

8.9.4 Custom Operations without associated resources

8.9.4.1 Overview

The structure of the custom operation URIs of the Eees_ACRStatusUpdate API is shown in Figure 8.9.4.1-1.

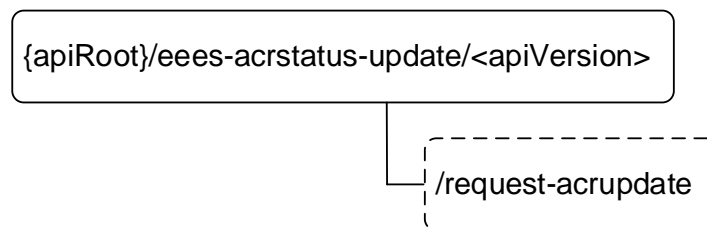


Figure 8.9.4.1-1: Custom operation URI structure of the Eees_ACRStatusUpdate API

Table 8.9.4.1-1 provides an overview of the custom operations and applicable HTTP methods defined for the Eees_ACRStatusUpdate API.

Table 8.9.4.1-1: Custom operations without associated resources

Operation name	Custom operation URI	Mapped HTTP method	Description
RequestACRUpdate	/request-acrupdate	POST	Enables a service consumer to update the information related to ACR (e.g. indicate the status of ACT, update the notification target address) at the EES.

8.9.4.2 Operation: RequestACRUpdate

8.9.4.2.1 Description

The custom operation enables a service consumer to update the information related to ACR (e.g. indicate the status of ACT, update the notification target address) at the EES.

8.9.4.2.2 Operation Definition

This operation shall support the request data structures and the response data structures and response codes specified in tables 8.9.4.2.2-1 and 8.9.4.2.2-2.

Table 8.9.4.2.2-1: Data structures supported by the POST Request Body on this resource

Data type	P	Cardinality	Description
ACRUpdateData	M	1	Parameters to update the information related to ACR (e.g. indicate the status of ACT, update the notification target address).

Table 8.9.4.2.2-2: Data structures supported by the POST Response Body on this resource

Data type	P	Cardinality	Response codes	Description
ACRDataStatus	M	1	200 OK	The communicated ACR update information was successfully received. The response body contains the feedback of the EES.
n/a			204 No Content	The communicated ACR update information was successfully received.
n/a			307 Temporary Redirect	Temporary redirection. The response shall include a Location header field containing an alternative target URI located in an alternative EES. Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [6].
n/a			308 Permanent Redirect	Permanent redirection. The response shall include a Location header field containing an alternative target URI located in an alternative EES. Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [6].
NOTE: The mandatory HTTP error status code for the HTTP POST method listed in Table 5.2.6-1 of 3GPP TS 29.122 [6] also apply.				

Table 8.9.4.2.2-3: Headers supported by the 307 Response Code on this resource

Name	Data type	P	Cardinality	Description
Location	string	M	1	An alternative target URI located in an alternative EES.

Table 8.9.4.2.2-4: Headers supported by the 308 Response Code on this resource

Name	Data type	P	Cardinality	Description
Location	string	M	1	An alternative target URI located in an alternative EES.

8.9.5 Notifications

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

8.9.6 Data Model

8.9.6.1 General

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

Table 8.9.6.1-1 specifies the data types defined for the Eees_ACRStatusUpdate API.

Table 8.9.6.1-1: Eees_ACRStatusUpdate API specific Data Types

Data type	Clause defined	Description	Applicability
ACRUpdateData	8.9.6.2.2	Represents the parameters to update the information related to ACR (e.g. indicate the status of ACT, update the notification target address).	
ACRDataStatus	8.9.6.2.3	Represents the ACR status information.	
ACTFailureCause	8.9.6.3.5	Represents the cause of ACT failure.	
ACTResult	8.9.6.3.3	Represents the result of ACT.	
ACTResultInfo	8.9.6.2.4	Represents the result of ACT and the related information.	
E3SubscsStatus	8.9.6.3.4	Represents the status of the initialization of EDGE-3 subscriptions.	

Table 8.9.6.1-2 specifies data types re-used by the Eees_ACRStatusUpdate API from other specifications, including a reference to their respective specifications and when needed, a short description of their use within the Eees_ACRStatusUpdate API.

Table 8.9.6.1-2: Eees_ACRStatusUpdate API re-used Data Types

Data type	Reference	Comments	Applicability
EndPoint	Clause 8.1.5.2.5	Represents the endpoint information.	
Gpsi	3GPP TS 29.571 [8]	Represents the identifier of a UE.	
Uri	3GPP TS 29.122 [6]	Represents a URI.	

8.9.6.2 Structured data types

8.9.6.2.1 Introduction

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

8.9.6.2.2 Type: ACRUpdateData

Table 8.9.6.2.2-1: Definition of type ACRUpdateData

Attribute name	Data type	P	Cardinality	Description	Applicability
easId	string	M	1	Contains the application identifier of the service consumer (e.g. URI, FQDN) that is sending the ACR status update request.	
acId	string	O	0..1	Contains the identifier of the concerned AC.	
actResultInfo	ACTResultInfo	O	0..1	Contains the status of ACT, i.e. whether it was successful or failed, and the related information. This attribute may be included if the service consumer is the S-EAS, CAS or the T-EAS. In the case of an EEL Managed ACR, this attribute shall not be included by a T-EAS acting as the service consumer. (NOTE)	
e3SubscIds	array(string)	O	1..N	Contains a list of EDGE-3 subscription identifiers. This attribute may be included only if the service consumer sending the request is the T-EAS. (NOTE)	
e3NotificationUri	Uri	O	0..1	Contains the updated notification URI via which the service consumer desires to receive notifications (related to EDGE-3 subscriptions) from the EES. This attribute may be included only if the service consumer sending the request is the T-EAS. (NOTE)	
NOTE: At least one of the "actResultInfo", "e3SubscIds" or "e3NotificationUri" attributes shall be present.					

8.9.6.2.3 Type: ACRDataStatus

Table 8.9.6.2.3-1: Definition of type ACRDataStatus

Attribute name	Data type	P	Cardinality	Description	Applicability
e3SubscsStatus	E3SubscsStatus	M	1	Contains the status of the initialization of EDGE-3 subscriptions, i.e. whether it was successful or failed.	
e3SubscIds	array(string)	O	1..N	Contains an updated list of EDGE-3 subscription identifiers. The absence of a subscription identifier implies no change for this subscription identifier. This attribute may be provided if the "e3SubscsStatus" attribute is set to "SUCCESSFUL".	

8.9.6.2.4 Type: ACTResultInfo

Table 8.9.6.2.4-1: Definition of type ACTResultInfo

Attribute name	Data type	P	Cardinality	Description	Applicability
actResult	ACTResult	M	1	Contains the status of ACT, i.e. whether it was successful or failed.	
actFailureCause	ACTFailureCause	C	0..1	Contains the cause of ACT failure. This attribute shall be provided only if the "actResult" attribute is set to "FAILED".	
ueId	Gpsi	M	1	Contains the identifier of the concerned UE.	
easEndPoint	EndPoint	M	1	Contains the endpoint of the other EAS to or from which the ACT was performed.	

8.9.6.3 Simple data types and enumerations

8.9.6.3.1 Introduction

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

8.9.6.3.2 Simple data types

The simple data types defined in table 8.9.6.3.2-1 shall be supported.

Table 8.9.6.3.2-1: Simple data types

Type Name	Type Definition	Description	Applicability

8.9.6.3.3 Enumeration: ACTResult

The enumeration ACTResult represents the result of ACT. It shall comply with the provisions defined in table 8.9.6.3.3-1.

Table 8.9.6.3.3-1: Enumeration ACTResult

Enumeration value	Description	Applicability
SUCCESSFUL	Indicates that the ACT was successful.	
FAILED	Indicates that the ACT failed.	

8.9.6.3.4 Enumeration: E3SubscsStatus

The enumeration E3SubscsStatus represents the status of the initialization of EDGE-3 subscriptions. It shall comply with the provisions defined in table 8.9.6.3.4-1.

Table 8.9.6.3.4-1: Enumeration E3SubscsStatus

Enumeration value	Description	Applicability
SUCCESSFUL	Indicates that the initialization of EDGE-3 subscriptions was successful.	
FAILED	Indicates that the initialization of EDGE-3 subscriptions failed.	

8.9.6.3.5 Enumeration: ACTFailureCause

The enumeration ACTFailureCause represents the cause of ACT failure. It shall comply with the provisions defined in table 8.9.6.3.5-1.

Table 8.9.6.3.5-1: Enumeration ACTFailureCause

Enumeration value	Description	Applicability
ACR_CANCELLATION	Indicates that the ACT failed due to the cancellation of the ACR.	
OTHER	Indicates that the ACT failed for other reasons.	

8.9.6.4 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.

8.9.6.5 Binary data

8.9.6.5.1 Binary Data Types

Table 8.9.6.5.1-1: Binary Data Types

Name	Clause defined	Content type

8.9.7 Error Handling

8.9.7.1 General

For the Eees_ACRStatusUpdate API, HTTP error responses shall be supported as specified in clause 5.2.6 of 3GPP TS 29.122 [6]. Protocol errors and application errors specified in clause 5.2.6 of 3GPP TS 29.122 [6] shall be supported for the HTTP status codes specified in table 5.2.6-1 of 3GPP TS 29.122 [6].

In addition, the requirements in the following clauses are applicable for the Eees_ACRStatusUpdate API.

8.9.7.2 Protocol Errors

No specific protocol errors for the Eees_ACRStatusUpdate API are specified.

8.9.7.3 Application Errors

The application errors defined for the Eees_ACRStatusUpdate API are listed in Table 8.9.7.3-1.

Table 8.9.7.3-1: Application errors

Application Error	HTTP status code	Description

8.9.8 Feature negotiation

The optional features in table 8.9.8-1 are defined for the Eees_ACRStatusUpdate API. They shall be negotiated using the extensibility mechanism defined in clause 5.2.7 of 3GPP TS 29.122 [6].

Table 8.10.4.1-1 provides an overview of the custom operations and applicable HTTP methods defined for the Ees_ACRParameterInformation API.

Table 8.10.4.1-1: Custom operations without associated resources

Operation name	Custom operation URI	Mapped HTTP method	Description
Request	/send-acrparamsinfo	POST	Enables a service consumer to send ACR parameters information to the EES.

8.10.4.2 Operation: Request

8.10.4.2.1 Description

The custom operation enables a service consumer to send ACR parameters information to the EES.

8.10.4.2.2 Operation Definition

This operation shall support the request data structures and the response data structures and response codes specified in tables 8.10.4.2.2-1 and 8.10.4.2.2-2.

Table 8.10.4.2.2-1: Data structures supported by the POST Request Body

Data type	P	Cardinality	Description
ACRParamsInfo	M	1	Contains the ACR parameters information to be provisioned/updated.

Table 8.10.4.2.2-2: Data structures supported by the POST Response Body

Data type	P	Cardinality	Response codes	Description
n/a			204 No Content	Successful case. The ACR parameters information 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 EES. Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [6].
n/a			308 Permanent Redirect	Permanent redirection. The response shall include a Location header field containing an alternative target URI located in an alternative EES. Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [6].
NOTE: The mandatory HTTP error status codes for the HTTP POST method listed in Table 5.2.6-1 of 3GPP TS 29.122 [6] shall also apply.				

Table 8.10.4.2.2-3: Headers supported by the 307 Response Code

Name	Data type	P	Cardinality	Description
Location	string	M	1	Contains an alternative target URI located in an alternative EES.

Table 8.10.4.2.2-4: Headers supported by the 308 Response Code

Name	Data type	P	Cardinality	Description
Location	string	M	1	Contains an alternative target URI located in an alternative EES.

8.10.5 Notifications

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

8.10.6 Data Model

8.10.6.1 General

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

Table 8.10.6.1-1 specifies the data types defined for the Eees_ACRParameterInformation API.

Table 8.10.6.1-1: Eees_ACRParameterInformation API specific Data Types

Data type	Clause defined	Description	Applicability
ACRParamsInfo	8.10.6.2.2	Represents the ACR parameters information.	

Table 8.10.6.1-2 specifies data types re-used by the Eees_ACRParameterInformation API from other specifications, including a reference to their respective specifications and when needed, a short description of their use within the Eees_ACRParameterInformation API.

Table 8.10.6.1-2: Eees_ACRParameterInformation API re-used Data Types

Data type	Reference	Comments	Applicability
ACRParameters	Clause 8.6.5.2.13	Represents ACR parameters.	
EndPoint	Clause 8.1.5.2.5	Represents the endpoint information.	

8.10.6.2 Structured data types

8.10.6.2.1 Introduction

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

8.10.6.2.2 Type: ACRParamsInfo

Table 8.10.6.2.2-1: Definition of type ACRParamsInfo

Attribute name	Data type	P	Cardinality	Description	Applicability
requestorId	string	M	1	Contains the identifier of the service consumer that is sending the request.	
eeclId	string	M	1	Contains the identifier of the concerned EEC.	
acId	string	M	1	Contains the identifier of the concerned AC.	
sAsEndPoint	EndPoint	M	1	Contains the endpoint information of the source Application Server (e.g., S-EAS, CAS).	
tAsEndPoint	EndPoint	M	1	Contains the endpoint information of the target Application Server (e.g., T-EAS, CAS).	
acrParams	ACRParameters	M	1	Contains the ACR Parameters.	

8.10.6.3 Simple data types and enumerations

8.10.6.3.1 Introduction

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

8.10.6.3.2 Simple data types

The simple data types defined in table 8.10.6.3.2-1 shall be supported.

Table 8.10.6.3.2-1: Simple data types

Type Name	Type Definition	Description	Applicability

8.10.6.4 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.

8.10.6.5 Binary data

8.10.6.5.1 Binary Data Types

Table 8.10.6.5.1-1: Binary Data Types

Name	Clause defined	Content type

8.10.7 Error Handling

8.10.7.1 General

For the Eees_ACRParameterInformation API, HTTP error responses shall be supported as specified in clause 5.2.6 of 3GPP TS 29.122 [6]. Protocol errors and application errors specified in clause 5.2.6 of 3GPP TS 29.122 [6] shall be supported for the HTTP status codes specified in table 5.2.6-1 of 3GPP TS 29.122 [6].

In addition, the requirements in the following clauses are applicable for the Eees_ACRParameterInformation API.

8.10.7.2 Protocol Errors

No specific protocol errors for the Eees_ACRParameterInformation API are specified.

8.10.7.3 Application Errors

The application errors defined for the Eees_ACRParameterInformation API are listed in Table 8.10.7.3-1.

Table 8.10.7.3-1: Application errors

Application Error	HTTP status code	Description	Applicability

8.10.8 Feature negotiation

The optional features in table 8.10.8-1 are defined for the Eees_ACRParameterInformation API. They shall be negotiated using the extensibility mechanism defined in clause 5.2.7 of 3GPP TS 29.122 [6].

Table 8.10.8-1: Supported Features

Feature number	Feature Name	Description

8.11 Eees_CommonEASAnnouncement API

8.11.1 Introduction

The Eees_CommonEASAnnouncement service shall use the Eees_CommonEASAnnouncement API.

The API URI of the Eees_CommonEASAnnouncement 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 [6], 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 [6].
- The <apiName> shall be "ees-cea".
- The <apiVersion> shall be "v1".
- The <apiSpecificSuffixes> shall be set as described in clause 5.2.4 of 3GPP TS 29.122 [6].

NOTE: When 3GPP TS 29.122 [6] is referenced for the common protocol and interface aspects for API definition in the clauses under clause 6.5, the EES takes the role of the SCEF and the service consumer takes the role of the SCS/AS.

8.11.2 Usage of HTTP

The provisions of clause 5.2.2 of 3GPP TS 29.122 [6] shall apply for the Eees_CommonEASAnnouncement API.

8.11.3 Resources

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

8.11.4 Custom Operations without associated resources

8.11.4.1 Overview

The structure of the custom operation URIs of the Eees_CommonEASAnnouncement API is shown in Figure 8.11.4.1-1.

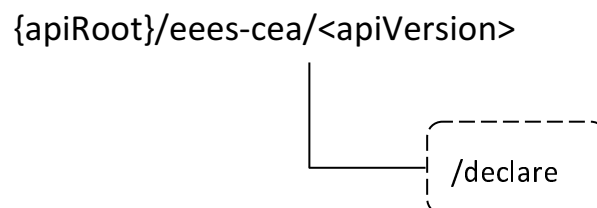


Figure 8.11.4.1-1: Custom operation URI structure of the Eees_CommonEASAnnouncement API

Table 8.11.4.1-1 provides an overview of the custom operations and applicable HTTP methods defined for the Eees_CommonEASAnnouncement API.

Table 8.11.4.1-1: Custom operations without associated resources

Operation name	Custom operation URI	Mapped HTTP method	Description
Declare	/declare	POST	Enables a service consumer to send common EAS information to the EES.

8.11.4.2 Operation: Declare

8.11.4.2.1 Description

The custom operation enables a service consumer to send common EAS information to the EES.

8.11.4.2.2 Operation Definition

This operation shall support the request data structures and the response data structures and response codes specified in tables 8.11.4.2.2-1 and 8.11.4.2.2-2.

Table 8.11.4.2.2-1: Data structures supported by the POST Request Body on this resource

Data type	P	Cardinality	Description
CommonEASInfo	M	1	Contains the common EAS information to be declared.

Table 8.11.4.2.2-2: Data structures supported by the POST Response Body on this resource

Data type	P	Cardinality	Response codes	Description
n/a			204 No Content	Successful case. The common EAS information is successfully received 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 target URI located in an alternative EES. Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [6].
n/a			308 Permanent Redirect	Permanent redirection. The response shall include a Location header field containing an alternative target URI located in an alternative EES. Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [6].
NOTE: The mandatory HTTP error status codes for the HTTP POST method listed in Table 5.2.6-1 of 3GPP TS 29.122 [6] shall also apply.				

Table 8.11.4.2.2-3: 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 EES.

Table 8.11.4.2.2-4: 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 EES.

8.11.5 Notifications

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

8.11.6 Data Model

8.11.6.1 General

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

Table 8.11.6.1-1 specifies the data types defined for the Eees_CommonEASAnnouncement API.

Table 8.10.6.1-1: Eees_CommonEASAnnouncement API specific Data Types

Data type	Clause defined	Description	Applicability
CommonEASInfo	8.11.6.2.2	Represents the common EAS information.	

Table 8.11.6.1-2 specifies data types re-used by the Eees_CommonEASAnnouncement API from other specifications, including a reference to their respective specifications and when needed, a short description of their use within the Eees_CommonEASAnnouncement API.

Table 8.11.6.1-2: Eees_CommonEASAnnouncement API re-used Data Types

Data type	Reference	Comments	Applicability
EndPoint	8.1.5.2.5	Represents the end point information of an entity.	

8.11.6.2 Structured data types

8.11.6.2.1 Introduction

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

8.11.6.2.2 Type: CommonEASInfo

Table 8.11.6.2.2-1: Definition of type CommonEASInfo

Attribute name	Data type	P	Cardinality	Description	Applicability
requestorId	string	M	1	Contains the identifier of the service consumer (e.g., announcing EES) that is sending the request.	
requestorEndPt	EndPoint	O	0..1	Contains the endpoint information of the service consumer (e.g., announcing EES).	
easId	string	M	1	Contains the identifier of the selected common EAS.	
easEndPt	EndPoint	M	1	Contains the endpoint information of the selected common EAS.	
appGrpId	string	M	1	Contains the targeted application group identifier.	

8.11.6.3 Simple data types and enumerations

8.11.6.3.1 Introduction

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

8.11.6.3.2 Simple data types

The simple data types defined in table 8.11.6.3.2-1 shall be supported.

Table 8.11.6.3.2-1: Simple data types

Type Name	Type Definition	Description	Applicability

8.11.6.4 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.

8.11.6.5 Binary data

8.11.6.5.1 Binary Data Types

Table 8.11.6.5.1-1: Binary Data Types

Name	Clause defined	Content type

8.11.7 Error Handling

8.11.7.1 General

For the Eees_CommonEASAnnouncement API, HTTP error responses shall be supported as specified in clause 5.2.6 of 3GPP TS 29.122 [6]. Protocol errors and application errors specified in clause 5.2.6 of 3GPP TS 29.122 [6] shall be supported for the HTTP status codes specified in table 5.2.6-1 of 3GPP TS 29.122 [6].

In addition, the requirements in the following clauses are applicable for the Eees_CommonEASAnnouncement API.

8.11.7.2 Protocol Errors

No specific protocol errors for the Eees_CommonEASAnnouncement API are specified.

8.11.7.3 Application Errors

The application errors defined for the Eees_CommonEASAnnouncement API are listed in Table 8.11.7.3-1.

Table 8.11.7.3-1: Application errors

Application Error	HTTP status code	Description	Applicability

8.11.8 Feature negotiation

The optional features in table 8.10.8-1 are defined for the Eees_CommonEASAnnouncement API. They shall be negotiated using the extensibility mechanism defined in clause 5.2.7 of 3GPP TS 29.122 [6].

Table 8.11.8-1: Supported Features

Feature number	Feature Name	Description

8.12 Eees_TrafficInfluenceEAS API

8.12.1 Introduction

The Eees_TrafficInfluenceEAS service shall use the Eees_TrafficInfluenceEAS API.

The API URI of the Eees_TrafficInfluenceEAS 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 [6], 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 [6].
- The <apiName> shall be "ees-tie".
- The <apiVersion> shall be "v1".
- The <apiSpecificSuffixes> shall be set as described in clause 5.2.4 of 3GPP TS 29.122 [6].

8.12.2 Usage of HTTP

The provisions of clause 5.2.2 of 3GPP TS 29.122 [6] shall apply for the Eees_TrafficInfluenceEAS API.

8.12.3 Resources

8.12.3.1 Overview

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

Figure 8.12.3.1-1 depicts the resource URIs structure for the Eees_TrafficInfluenceEAS API.

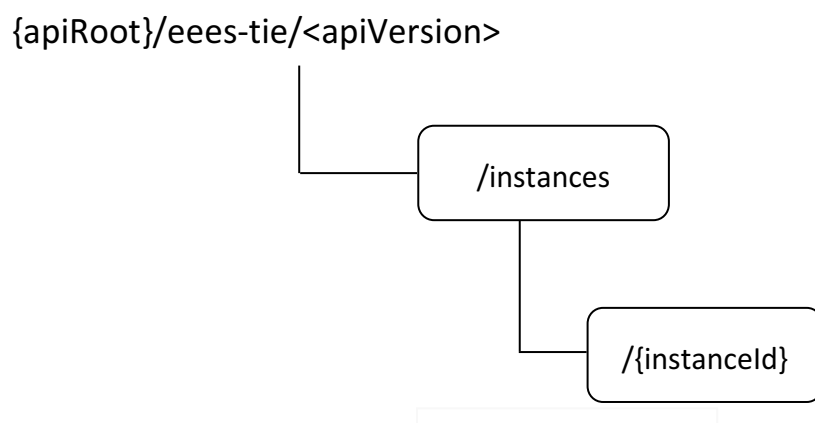


Figure 8.12.3.1-1: Resource URIs structure of the Eees_TrafficInfluenceEAS API

Table 8.12.3.1-1 provides an overview of the resources and applicable HTTP methods for the Eees_TrafficInfluenceEAS API.

Table 8.12.3.1-1: Resources and methods overview

Resource name	Resource URI	HTTP method or custom operation	Description
Application Traffic Influence Instances	/instances	POST	Request the creation of an Application Traffic Influence Instance.
Individual Application Traffic Influence Instance	/instances/{instanceId}	GET	Request the retrieval of an "Individual Application Traffic Influence Instance" resource.
		PUT	Request the update of an existing "Individual Application Traffic Influence Instance" resource.
		PATCH	Request the modification of an existing "Individual Application Traffic Influence Instance" resource.
		DELETE	Request the cancelation of an existing "Individual Application Traffic Influence Instance" resource.

8.12.3.2 Resource: Application Traffic Influence

8.12.3.2.1 Description

This resource represents the collection of Application Traffic Influence Instances managed by the EES.

8.12.3.2.2 Resource Definition

Resource URI: {apiRoot}/ees-tie/<apiVersion>/instances

This resource shall support the resource URI variables defined in table 8.12.3.2.2-1.

Table 8.12.3.2.2-1: Resource URI variables for this resource

Name	Data type	Definition
apiRoot	string	See clause 5.2.4 of 3GPP TS 29.122 [6].

8.12.3.2.3 Resource Standard Methods

The following clauses specify the standard methods supported by the resource.

8.12.3.2.3.1 POST

The POST method allows a service consumer to request the creation of an Application Traffic Influence Instance.

This method shall support the URI query parameters specified in table 8.12.3.2.3.1-1.

Table 8.12.3.2.3.1-1: 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 8.12.3.2.3.1-2 and the response data structures and response codes specified in table 8.12.3.2.3.1-3.

Table 8.12.3.2.3.1-2: Data structures supported by the POST Request Body on this resource

Data type	P	Cardinality	Description
AppTrafficInfluence	M	1	Represents the parameters to request the creation of an Application Traffic Influence Instance.

Table 8.12.3.2.3.1-3: Data structures supported by the POST Response Body on this resource

Data type	P	Cardinality	Response codes	Description
AppTrafficInfluence	M	1	201 Created	Successful case. The application traffic influence is successfully created and a representation of the created "Individual Application Traffic Influence Instance" resource is returned. An HTTP "Location" header that contains the URI of the created "Individual Application Traffic Influence Instance" 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 [6] shall also apply.

Table 8.12.3.2.3.1-4: 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}/ees-tie/<apiVersion>/instances/{instanceId}

8.12.3.2.4 Resource Custom Operations

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

8.12.3.3 Resource: Individual Application Traffic Influence

8.12.3.3.1 Description

This resource represents the collection of Individual Application Traffic Influence Instances managed by the EES.

8.12.3.3.2 Resource Definition

Resource URI: {apiRoot}/ees-tie/<apiVersion>/instances/{instanceId}

This resource shall support the resource URI variables defined in table 8.12.3.3.2-1.

Table 8.12.3.3.2-1: Resource URI variables for this resource

Name	Data type	Definition
apiRoot	string	See clause 5.2.4 of 3GPP TS 29.122 [6].
instanceId	string	Contains the identifier of a Individual Application Traffic Influence

8.12.3.3.3 Resource Standard Methods

The following clauses specify the standard methods supported by the resource.

8.12.3.3.3.1 GET

This method requests retrieval of an existing Application Traffic Influence Instance.

This method shall support the URI query parameters specified in the table 8.12.3.3.3.2-1.

Table 8.12.3.3.3.1-1: URI query parameters supported by the GET method on this resource

Name	Data type	P	Cardinality	Description

This method shall support the request data structures specified in table 8.12.3.3.3.1-2 and the response data structures and response codes specified in table 8.12.3.3.3.1-3.

Table 8.12.3.3.3.1-2: Data structures supported by the GET Request Body on this resource

Data type	P	Cardinality	Description
n/a			

Table 8.12.3.3.3.1-3: Data structures supported by the GET Response Body on this resource

Data type	P	Cardinality	Response codes	Description
AppTrafficInfluence	M	1	200 OK	The individual Application Traffic Influence is successfully returned by the EES.
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 EES. Redirection handling is described in clause 5.2.10 of TS 29.122 [6].
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 EES. Redirection handling is described in clause 5.2.10 of TS 29.122 [6].
NOTE: The mandatory HTTP error status codes for the GET method listed in Table 5.2.6-1 of 3GPP TS 29.122 [6] shall also apply.				

Table 8.12.3.3.3.1-4: 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 EES.

Table 8.12.3.3.3.1-5: 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 EES.

8.12.3.3.3.2 PUT

This method requests modification of an existing Application Traffic Influence Instance.

This method shall support the URI query parameters specified in the table 8.12.3.3.3.2-1.

Table 8.12.3.3.3.2-1: URI query parameters supported by the PUT method on this resource

Name	Data type	P	Cardinality	Description
n/a				

This method shall support the request data structures specified in table 8.12.3.3.3.2-2 and the response data structures and response codes specified in table 8.12.3.3.3.2-3.

Table 8.12.3.3.3.2-2: Data structures supported by the PUT Request Body on this resource

Data type	P	Cardinality	Description
AppTrafficInfluence	M	1	Request to update the Application Traffic Influence Instance.

Table 8.12.3.3.3.2-3: Data structures supported by the PUT Response Body on this resource

Data type	P	Cardinality	Response codes	Description
AppTrafficInfluence	M	1	200 OK	The "Individual Application Traffic Influence Instance" resource is successfully updated and the updated representation of the resource is returned in the response.
n/a			204 No Content	The Individual Application Traffic Influence Instance" resource is successfully modified.
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 EES. Redirection handling is described in clause 5.2.10 of TS 29.122 [6].
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 EES. Redirection handling is described in clause 5.2.10 of TS 29.122 [6].
NOTE: The mandatory HTTP error status codes for the PUT method listed in Table 5.2.6-1 of 3GPP TS 29.122 [6] shall also apply.				

Table 8.12.3.3.3.2-4: 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 EES.

Table 8.12.3.3.3.2-5: 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 EES.

8.12.3.3.3.3 PATCH

This method modifies an existing Application Traffic Influence Instance.

This method shall support the URI query parameters specified in the table 8.12.3.3.3.3-1.

Table 8.12.3.3.3.3-1: URI query parameters supported by the PATCH method on this resource

Name	Data type	P	Cardinality	Description
n/a				

This method shall support the request data structures specified in table 8.12.3.3.3.3-2 and the response data structures and response codes specified in table 8.12.3.3.3.3-3.

Table 8.12.3.3.3.3-2: Data structures supported by the PATCH Request Body on this resource

Data type	P	Cardinality	Description
AppTrafficInfluencePatch	M	1	Request to modify the Application Traffic Influence Instance.

Table 8.12.3.3.3.3-3: Data structures supported by the PATCH Response Body on this resource

Data type	P	Cardinality	Response codes	Description
AppTrafficInfluence	M	1	200 OK	The "Individual Application Traffic Influence Instance" resource is successfully modified and the updated representation of the resource is returned in the response
n/a			204 No Content	The "Individual Application Traffic Influence Instance" resource is successfully modified.
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 EES. Redirection handling is described in clause 5.2.10 of TS 29.122 [6].
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 EES. Redirection handling is described in clause 5.2.10 of TS 29.122 [6].
NOTE: The mandatory HTTP error status codes for the PATCH method listed in Table 5.2.6-1 of 3GPP TS 29.122 [6] shall also apply.				

Table 8.12.3.3.3.3-4: 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 EES.

Table 8.12.3.3.3.3-5: 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 EES.

8.12.3.3.3.4 DELETE

This method cancels an existing Application Traffic Influence Instance.

This method shall support the URI query parameters specified in table 8.12.3.3.3.4-1.

Table 8.12.3.3.3.4-1: URI query parameters supported by the DELETE method on this resource

Name	Data type	P	Cardinality	Description
n/a				

This method shall support the request data structures specified in table 8.12.3.3.3.4-2 and the response data structures and response codes specified in table 8.12.3.3.3.4-3.

Table 8.12.3.3.3.4-2: Data structures supported by the DELETE Request Body on this resource

Data type	P	Cardinality	Description
n/a			

Table 8.12.3.3.3.4-3: Data structures supported by the DELETE Response Body on this resource

Data type	P	Cardinality	Response codes	Description
n/a			204 No Content	The "Individual Application Traffic Influence Instance" 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 EES. Redirection handling is described in clause 5.2.10 of TS 29.122 [6].
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 EES. Redirection handling is described in clause 5.2.10 of TS 29.122 [6].
NOTE: The mandatory HTTP error status codes for the DELETE method listed in Table 5.2.6-1 of 3GPP TS 29.122 [6] shall also apply.				

Table 8.12.3.3.3.4-4: 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 EES.

Table 8.12.3.3.3.4-5: 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 EES.

8.12.3.3.4 Resource Custom Operations

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

8.12.4 Notifications

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

8.12.5 Data Model

8.12.5.1 General

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

Table 8.12.5.1-1 specifies the data types defined for the Eees_TrafficInfluenceEAS API.

Table 8.12.5.1-1: Eees_TrafficInfluenceEAS API specific Data Types

Data type	Clause defined	Description	Applicability
AppTrafficInfluence	8.12.5.2.2	Represents the application traffic influence information.	
AppTrafficInfluencePatch	8.12.5.2.3	Represents the parameters to request the modification of an application traffic influence instance.	

Table 8.12.5.1-2 specifies data types re-used by the Eees_TrafficInfluenceEAS API from other specifications, including a reference to their respective specifications and when needed, a short description of their use within the Eees_TrafficInfluenceEAS API.

Table 8.12.5.1-2: Eees_TrafficInfluenceEAS API re-used Data Types

Data type	Reference	Comments	Applicability
SupportedFeatures	3GPP TS 29.571 [8]	Represents the list of supported features.	
TargetUeIdentification	8.6.5.2.8	Indicates the target UE.	

8.12.5.2 Structured data types

8.12.5.2.1 Introduction

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

8.12.5.2.2 Type: AppTrafficInfluence

Table 8.12.5.2.2-1: Definition of type AppTrafficInfluence

Attribute name	Data type	P	Cardinality	Description	Applicability
requestorId	string	M	1	Contains the identifier of the service consumer that is sending the request.	
tgtUes	array(TargetUeldentification)	C	1..N	Indicates the target UE(s). (NOTE 1)	
addTgtUes	array(TargetUeldentification)	C	1..N	Indicates the target UE(s) to be added. (NOTE 2)	
deleTgtUes	array(TargetUeldentification)	C	1..N	Indicates the target UE(s) to be deleted. (NOTE 2)	
anyUe	boolean	C	0..1	Indicates whether the request applies to any UE. - "true": Indicates that the request applies to any UE. - "false": Indicates that the request does not apply to any UE. - The default value when this attribute is omitted is "false". (NOTE 1) (NOTE 2)	
suppFeat	SupportedFeatures	C	0..1	Contains the list of supported features among the ones defined in clause 8.12.7. This attribute shall be present only when feature negotiation needs to take place.	
NOTE 1: Either the "anyUe" attribute set to the value "true" or the "tgtUes" attribute shall be present in the Application Traffic Influence creation request. The "edgeUeld" attribute within the TargetUeldentification data type is not applicable for the "tgtUes" attribute.					
NOTE 2: Either the "anyUe" attribute set to the value "true" or the "addTgtUes" and/or "deleTgtUes" attributes shall be present in the Application Traffic Influence update request. The "edgeUeld" attribute within the TargetUeldentification data type is not applicable for the "addTgtUes" and "deleTgtUes" attributes.					

8.12.5.2.3 Type: AppTrafficInfluencePatch

Table 8.12.5.2.3-1: Definition of type AppTrafficInfluencePatch

Attribute name	Data type	P	Cardinality	Description	Applicability
addTgtUes	array(TargetUeId entification)	O	1..N	Indicates the target UE(s) to be added. (NOTE)	
deleTgtUes	array(TargetUeId entification)	O	1..N	Indicates the target UE(s) to be deleted. (NOTE)	
anyUe	boolean	O	0..1	Indicates whether the request applies to any UE. - "true": Indicates that the request applies to any UE. - "false": Indicates that the request does not apply to any UE. (NOTE)	
<p>NOTE: Either the "anyUe" attribute set to the value "true" or the "addTgtUes" and/or "deleTgtUes" attributes may be present. If the "anyUe" attribute is present and set to the "true" and the existing resource representation contains the "tgtUes" attribute, then the "tgtUes" attribute shall be deleted from the resource representation. If the "addTgtUes" and/or "deleTgtUes" attributes is present and the existing resource representation contains the "anyUe" attribute set to "true", the "anyUe" attribute shall either be deleted from the resource representation or its value changed to "false".</p>					

8.12.5.3 Simple data types and enumerations

8.12.5.3.1 Introduction

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

8.12.5.3.2 Simple data types

The simple data types defined in table 8.12.5.3.2-1 shall be supported.

Table 8.12.5.3.2-1: Simple data types

Type Name	Type Definition	Description	Applicability

8.12.5.4 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.

8.12.5.5 Binary data

8.12.5.5.1 Binary Data Types

Table 8.12.5.5.1-1: Binary Data Types

Name	Clause defined	Content type

8.12.6 Error Handling

8.12.6.1 General

For the Eees_TrafficInfluenceEAS API, HTTP error responses shall be supported as specified in clause 5.2.6 of 3GPP TS 29.122 [6]. Protocol errors and application errors specified in clause 5.2.6 of 3GPP TS 29.122 [6] shall be supported for the HTTP status codes specified in table 5.2.6-1 of 3GPP TS 29.122 [6].

In addition, the requirements in the following clauses are applicable for the Eees_TrafficInfluenceEAS API.

8.12.6.2 Protocol Errors

No specific protocol errors for the Eees_TrafficInfluenceEAS API are specified.

8.12.6.3 Application Errors

The application errors defined for the Eees_TrafficInfluenceEAS API are listed in Table 8.12.6.3-1.

Table 8.12.6.3-1: Application errors

Application Error	HTTP status code	Description	Applicability

8.12.7 Feature negotiation

The optional features in table 8.10.7-1 are defined for the Eees_TrafficInfluenceEAS API. They shall be negotiated using the extensibility mechanism defined in clause 5.2.7 of 3GPP TS 29.122 [6].

Table 8.12.7-1: Supported Features

Feature number	Feature Name	Description

8A CAS API Definitions

8A.1 Ecas_SelectedEES API

8A.1.1 Introduction

The Ecas_SelectedEES service shall use the Ecas_SelectedEES API.

The API URI of the Ecas_SelectedEES 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 [6], 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 [6].
- The <apiName> shall be "ecas-selected-ees".

- The <apiVersion> shall be "v1".
- The <apiSpecificSuffixes> shall be set as described in clause 5.2.4 of 3GPP TS 29.122 [6].

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 CAS takes the role of the SCEF and the service consumer takes the role of the SCS/AS.

8A.1.2 Usage of HTTP

The provisions of clause 5.2.2 of 3GPP TS 29.122 [6] shall apply for the Ecas_SelectedEES API.

8A.1.3 Resources

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

8A.1.4 Custom Operations without associated resources

8A.1.4.1 Overview

The structure of the custom operation URIs of the Ecas_SelectedEES API is shown in Figure 8A.1.4.1-1.

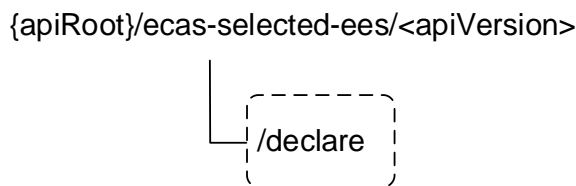


Figure 8A.1.4.1-1: Custom operation URI structure of the Ecas_SelectedEES API

Table 8A.1.4.1-1 provides an overview of the custom operations and applicable HTTP methods defined for the Ecas_SelectedEES API.

Table 8A.1.4.1-1: Custom operations without associated resources

Operation name	Custom operation URI	Mapped HTTP method	Description
Declare	/declare	POST	Enables a service consumer to declare the selected target EES related information.

8A.1.4.2 Operation: Declare

8A.1.4.2.1 Description

The custom operation enables a service consumer to inform the CAS about the selected target EES related information during an ACR procedure from EAS to CAS.

8A.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 8A.1.4.2.2-1 and 8A.1.4.2.2-2.

Table 8A.1.4.2.2-1: Data structures supported by the POST Request Body on this resource

Data type	P	Cardinality	Description
SeleESDeclInfo	M	1	Contains the parameters to declare the selected target EES related information.

Table 8A.1.4.2.2-2: Data structures supported by the POST Response Body on this resource

Data type	P	Cardinality	Response codes	Description
n/a			204 No Content	The selected EES declaration 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 CAS. Redirection handling is described in clause 5.2.10 of TS 29.122 [6].
n/a			308 Permanent Redirect	Permanent redirection. The response shall include a Location header field containing an alternative target URI located in an alternative CAS. Redirection handling is described in clause 5.2.10 of TS 29.122 [6].
NOTE: The mandatory HTTP error status codes for the HTTP POST method listed in Table 5.2.6-1 of 3GPP TS 29.122 [6] shall also apply.				

Table 8A.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 CAS.

Table 8A.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 CAS.

8A.1.5 Notifications

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

8A.1.6 Data Model

8A.1.6.1 General

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

Table 8A.1.6.1-1 specifies the data types defined for the Ecas_SelectedEES API.

Table 8A.1.6.1-1: Ecas_SelectedEES API specific Data Types

Data type	Clause defined	Description	Applicability
SeleESDeclInfo	8A.1.6.2.2	Represent the selected target EES related information.	

Table 8A.1.6.1-2 specifies data types re-used by the Ecas_SelectedEES API from other specifications, including a reference to their respective specifications and when needed, a short description of their use within the Ecas_SelectedEES API.

Table 8A.1.6.1-2: Ecas_SelectedEES API re-used Data Types

Data type	Reference	Comments	Applicability
EndPoint	Clause 8.1.5.2.5	Represents the endpoint information.	
Gpsi	3GPP TS 29.571 [8]	Used to identify the UE with GPSI.	
SupportedFeatures	3GPP TS 29.571 [8]	Represents the list of supported feature(s) and used to negotiate the applicability of the optional features.	

8A.1.6.2 Structured data types

8A.1.6.2.1 Introduction

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

8A.1.6.2.2 Type: SelEESDeclInfo

Table 8A.1.6.2.2-1: Definition of type SelEESDeclInfo

Attribute name	Data type	P	Cardinality	Description	Applicability
ueId	Gpsi	M	1	Contains the identifier of the UE.	
seleEesId	string	M	1	Contains the identifier of the selected EES.	
seleEndpoint	EndPoint	M	1	Contains Endpoint information (e.g. URI, FQDN, IP address) used to communicate with the selected EES.	
easId	string	M	1	Contains the identifier of the concerned EAS.	
acId	string	O	0..1	Contains the identifier of the concerned AC.	
supFeat	SupportedFeatures	C	0..1	Contains the list of supported features among the ones defined in clause 8A.1.8. This attribute shall be present only when feature negotiation needs to take place.	

8A.1.6.3 Simple data types and enumerations

8A.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.

8A.1.6.3.2 Simple data types

The simple data types defined in table 8A.1.6.3.2-1 shall be supported.

Table 8A.1.6.3.2-1: Simple data types

Type Name	Type Definition	Description	Applicability

8A.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.

8A.1.6.5 Binary data

8A.1.6.5.1 Binary Data Types

Table 8A.1.6.5.1-1: Binary Data Types

Name	Clause defined	Content type

8A.1.7 Error Handling

8A.1.7.1 General

For the Ecas_SelectedEES API, HTTP error responses shall be supported as specified in clause 5.2.6 of 3GPP TS 29.122 [6]. Protocol errors and application errors specified in clause 5.2.6 of 3GPP TS 29.122 [6] shall be supported for the HTTP status codes specified in table 5.2.6-1 of 3GPP TS 29.122 [6].

In addition, the requirements in the following clauses are applicable for the Ecas_SelectedEES API.

8A.1.7.2 Protocol Errors

No specific protocol errors for the Ecas_SelectedEES API are specified.

8A.1.7.3 Application Errors

The application errors defined for the Ecas_SelectedEES API are listed in Table 8A.1.7.3-1.

Table 8A.1.7.3-1: Application errors

Application Error	HTTP status code	Description	Applicability

8A.1.8 Feature negotiation

The optional features in table 8A.1.8-1 are defined for the Ecas_SelectedEES API. They shall be negotiated using the extensibility mechanism defined in clause 5.2.7 of 3GPP TS 29.122 [6].

Table 8A.1.8-1: Supported Features

Feature number	Feature Name	Description

9 Edge Configuration Server API Definitions

9.1 Eecs_EESRegistration API

9.1.1 Introduction

The Eecs_EESRegistration service shall use the Eecs_EESRegistration API.

The API URI of the Eecs_EESRegistration API shall be:

{apiRoot}/<apiName>/<apiVersion>

The request URIs used in HTTP requests shall have the Resource URI structure as defined in clause 7.5, i.e.:

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

with the following components:

- The {apiRoot} shall be set as described in clause 7.5.
- The <apiName> shall be "eecs-eesregistration".
- The <apiVersion> shall be "v1".
- The <apiSpecificResourceUriPart> shall be set as described in clause 9.1.2.

9.1.2 Resources

9.1.2.1 Overview

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

Figure 9.1.2.1-1 depicts the resource URIs structure for the Eecs_EESRegistration API.

{apiRoot}/eecs-eesregistration/<apiVersion>

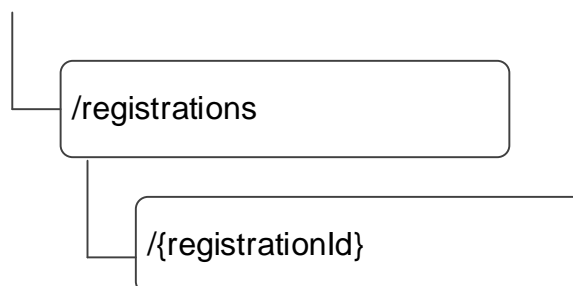


Figure 9.1.2.1-1: Resource URI structure of the Eecs_EESRegistration API

Table 9.1.2.1-1 provides an overview of the resources and applicable HTTP methods.

Table 9.1.2.1-1: Resources and methods overview

Resource name	Resource URI	HTTP method or custom operation	Description
EES Registrations	/registrations	POST	Registers a new EES at the Edge Configuration Server.
Individual EES Registration	/registrations/{registrationId}	GET	Fetch an individual EES registration resource.
		PUT	Fully replace an individual EES registration resource.
		DELETE	Remove an individual EES registration resource.
		PATCH	Partially update an individual EES registration resource.

9.1.2.2 Resource: EES Registrations

9.1.2.2.1 Description

This resource represents all the Edge Enabler Servers that are registered at a given Edge Configuration Server.

9.1.2.2.2 Resource Definition

Resource URI: `{apiRoot}/eecs-eesregistration/<apiVersion>/registrations`

This resource shall support the resource URI variables defined in the table 9.1.2.2.2-1.

Table 9.1.2.2.2-1: Resource URI variables for this resource

Name	Data Type	Definition
apiRoot	string	See clause 7.5

9.1.2.2.3 Resource Standard Methods

9.1.2.2.3.1 POST

This method shall support the URI query parameters specified in table 9.1.2.2.3.1-1.

Table 9.1.2.2.3.1-1: URI query parameters supported by the POST method on this resource

Name	Data type	P	Cardinality	Description
n/a				

This method shall support the request data structures specified in table 9.1.2.2.3.1-2 and the response data structures and response codes specified in table 9.1.2.2.3.1-3.

Table 9.1.2.2.3.1-2: Data structures supported by the POST Request Body on this resource

Data type	P	Cardinality	Description
EESRegistration	M	1	EES registration request information.

Table 9.1.2.2.3.1-3: Data structures supported by the POST Response Body on this resource

Data type	P	Cardinality	Response codes	Description
EESRegistration	M	1	201 Created	EES information is registered successfully at ECS. EES information registered with ECS is provided in the response body. The URI of the created resource shall be returned in the "Location" HTTP header.
NOTE: The mandatory HTTP error status code for the POST method listed in Table 5.2.6-1 of 3GPP TS 29.122 [6] also apply.				

Table 9.1.2.2.3.1-4: 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: <code>{apiRoot}/eecs-eesregistration/<apiVersion>/registrations/{registrationId}</code>

9.1.2.2.4 Resource Custom Operations

None.

9.1.2.3 Resource: Individual EES Registration

9.1.2.3.1 Description

This Individual EES Registration resource represents an individual EES registered at a given Edge Configuration Server.

9.1.2.3.2 Resource Definition

Resource URI: **{apiRoot}/eecs-eesregistration/<apiVersion>/registrations/{registrationId}**

This resource shall support the resource URI variables defined in the table 9.1.2.3.2-1.

Table 9.1.2.3.2-1: Resource URI variables for this resource

Name	Data Type	Definition
apiRoot	string	See clause 7.5
registrationId	string	The EES registration identifier.

9.1.2.3.3 Resource Standard Methods

9.1.2.3.3.1 GET

This method retrieves the EES information registered at Edge Configuration Server. This method shall support the URI query parameters specified in table 9.1.2.3.3.1-1.

Table 9.1.2.3.3.1-1: URI query parameters supported by the GET method on this resource

Name	Data type	P	Cardinality	Description
n/a				

This method shall support the request data structures specified in table 9.1.2.3.3.1-2 and the response data structures and response codes specified in table 9.1.2.3.3.1-3.

Table 9.1.2.3.3.1-2: Data structures supported by the GET Request Body on this resource

Data type	P	Cardinality	Description
n/a			

Table 9.1.2.3.3.1-3: Data structures supported by the GET Response Body on this resource

Data type	P	Cardinality	Response codes	Description
EESRegistration	M	1	200 OK	The EES registration information at the Edge Configuration Server.
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 ECS. Redirection handling is described in clause 5.2.10 of TS 29.122 [6].
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 ECS. Redirection handling is described in clause 5.2.10 of TS 29.122 [6].
NOTE: The mandatory HTTP error status code for the GET method listed in Table 5.2.6-1 of 3GPP TS 29.122 [6] also apply.				

Table 9.1.2.3.3.1-4: Headers supported by the 307 Response Code on this resource

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

Table 9.1.2.3.3.1-5: Headers supported by the 308 Response Code on this resource

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

9.1.2.3.3.2 PUT

This method updates the EES registration information at Edge Configuration Server by completely replacing the existing registration data (except the value of "eesId" within EESProfile data type and the value of "supFeat" attribute within the EESRegistration data type). This method shall support the URI query parameters specified in the table 9.1.2.3.3.2-1.

Table 9.1.2.3.3.2-1: URI query parameters supported by the PUT method on this resource

Name	Data type	P	Cardinality	Description
n/a				

This method shall support the request data structures specified in table 9.1.2.3.3.2-2 and the response data structures and response codes specified in table 9.1.2.3.3.2-3.

Table 9.1.2.3.3.2-2: Data structures supported by the PUT Request Body on this resource

Data type	P	Cardinality	Description
EESRegistration	M	1	Details of the EES registration information to be updated

Table 9.1.2.3.3.2-3: Data structures supported by the PUT Response Body on this resource

Data type	P	Cardinality	Response codes	Description
EESRegistration	M	1	200 OK	The EES registration information updated successfully and the updated EES registration information is returned in the response.
n/a			204 No Content	The EES registration information was updated successfully.
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 ECS. Redirection handling is described in clause 5.2.10 of TS 29.122 [6].
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 ECS. Redirection handling is described in clause 5.2.10 of TS 29.122 [6].
NOTE: The mandatory HTTP error status code for the PUT method listed in Table 5.2.6-1 of 3GPP TS 29.122 [6] also apply.				

Table 9.1.2.3.3.2-4: Headers supported by the 307 Response Code on this resource

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

Table 9.1.2.3.3.2-5: Headers supported by the 308 Response Code on this resource

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

9.1.2.3.3.3 DELETE

This method deregisters an EES registration from the ECS. This method shall support the URI query parameters specified in the table 9.1.2.3.3.3-1.

Table 9.1.2.3.3.3-1: URI query parameters supported by the DELETE method on this resource

Name	Data type	P	Cardinality	Description
n/a				

This method shall support the request data structures specified in table 9.1.2.3.3.3-2 and the response data structures and response codes specified in table 9.1.2.3.3.3-3.

Table 9.1.2.3.3.3-2: Data structures supported by the DELETE Request Body on this resource

Data type	P	Cardinality	Description
n/a			

Table 9.1.2.3.3.3-3: Data structures supported by the DELETE Response Body on this resource

Data type	P	Cardinality	Response codes	Description
n/a			204 No Content	The individual EES registration information matching the registrationId is 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 ECS. Redirection handling is described in clause 5.2.10 of TS 29.122 [6].
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 ECS. Redirection handling is described in clause 5.2.10 of TS 29.122 [6].
NOTE: The mandatory HTTP error status code for the DELETE method listed in Table 5.2.6-1 of 3GPP TS 29.122 [6] also apply.				

Table 9.1.2.3.3.3-4: Headers supported by the 307 Response Code on this resource

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

Table 9.1.2.3.3.3-5: Headers supported by the 308 Response Code on this resource

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

9.1.2.3.3.4 PATCH

This method partially updates the EES registration information at Edge Configuration Server. This method shall support the URI query parameters specified in the table 9.1.2.3.3.4-1.

Table 9.1.2.3.3.4-1: URI query parameters supported by the PATCH method on this resource

Name	Data type	P	Cardinality	Description
n/a				

This method shall support the request data structures specified in table 9.1.2.3.3.4-2 and the response data structures and response codes specified in table 9.1.2.3.3.4-3.

Table 9.1.2.3.3.4-2: Data structures supported by the PATCH Request Body on this resource

Data type	P	Cardinality	Description
EESRegistrationPatch	M	1	Details of the EES registration information to be updated

Table 9.1.2.3.3.4-3: Data structures supported by the PATCH Response Body on this resource

Data type	P	Cardinality	Response codes	Description
EESRegistration	M	1	200 OK	The Individual EES registration information was updated successfully and the updated EES registration information is returned in the response.
n/a			204 No Content	The Individual EES registration information was updated successfully.
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 ECS. Redirection handling is described in clause 5.2.10 of TS 29.122 [6].
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 ECS. Redirection handling is described in clause 5.2.10 of TS 29.122 [6].
NOTE: The mandatory HTTP error status code for the PUT method listed in Table 5.2.6-1 of 3GPP TS 29.122 [6] also apply.				

Table 9.1.2.3.3.4-4: Headers supported by the 307 Response Code on this resource

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

Table 9.1.2.3.3.4-5: Headers supported by the 308 Response Code on this resource

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

9.1.2.3.4 Resource Custom Operations

None.

9.1.3 Custom Operations without associated resources

None.

9.1.4 Notifications

None.

9.1.5 Data Model

9.1.5.1 General

This clause specifies the application data model supported by the API. Data types listed in clause 7.2 apply to this API

Table 9.1.5.1-1 specifies the data types defined specifically for the Eecs_EESRegistration API service.

Table 9.1.5.1-1: Eecs_EESRegistration API specific Data Types

Data type	Section defined	Description	Applicability
EDNInfo	9.1.5.2.10	Represents EDN related information	EdgeApp_2
EESRegistration	9.1.5.2.2	The EES registration information on ECS.	
EESProfile	9.1.5.2.3	The profile information related to the EES in the EESRegistration data type.	
ACRScenario	9.1.5.3.3	The ACR scenarios supported by EES.	
EESRegistrationPatch	9.1.5.2.4	To partially update the EES Registration information.	
ServiceArea	9.1.5.2.5	The topological and geographic areas served by EES.	
TopologicalServiceArea	9.1.5.2.6	The topological areas served by EES.	
GeographicalServiceArea	9.1.5.2.7	The geographic areas served by EES.	
EASInstantiationInfo	9.1.5.2.8	Represents the EAS instantiation information.	EdgeApp_2
InstantiationCriteria	9.1.5.2.9	Represents the instantiation criteria.	EdgeApp_2
InstantiationStatus	9.1.5.3.4	Represents the instantiation status.	EdgeApp_2

Table 9.1.5.1-2 specifies data types re-used by the Eecs_EESRegistration API service.

Table 9.1.5.1-2: Re-used Data Types

Data type	Reference	Comments	Applicability
SupportedFeatures	3GPP TS 29.571 [8]	Used to negotiate the applicability of optional features defined in table 9.1.7-1.	
ScheduledCommunicationTime	3GPP TS 29.122 [6]	Represents the schedule information.	
DateTime	3GPP TS 29.122 [6]	Represents a date and a time.	
Ecgi	3GPP TS 29.571 [8]	Represents an EUTRA cell identifier.	
Ncgi	3GPP TS 29.571 [8]	Represents an NR cell identifier.	
Tai	3GPP TS 29.571 [8]	Represents a tracking area identity.	
GeographicArea	3GPP TS 29.572 [11]	Identifies the geographical information of the user(s).	
CivicAddress	3GPP TS 29.572 [11]	Identifies the civic address information of the user(s).	
PlmnIdNid	3GPP TS 29.571 [8]	Identifies the network: PLMN Identifier or the SNPN Identifier (the PLMN Identifier and the NID). Used to indicate the serving network as part of topological service areas.	
Dnn	3GPP TS 29.571 [8]	Represents a DNN.	EdgeApp_2
Dnai	3GPP TS 29.571 [8]	Used to represent the list of DNAI(s) information associated with EES.	
TimeWindow	3GPP TS 29.122 [6]	Represents the time window.	
DateTimeRm	3GPP TS 29.571 [8]	Used to capture the expiration time EES registration patch.	
EndPoint	8.1.5.2.5	The end point information of the Edge Enabler Server in the EES profile.	
EASBundleInfo	8.1.5.3.8	Represents EAS bundle information.	EdgeApp_2

9.1.5.2 Structured data types

9.1.5.2.1 Introduction

9.1.5.2.2 Type: EESRegistration

Table 9.1.5.2.2-1: Definition of type EESRegistration

Attribute name	Data type	P	Cardinality	Description	Applicability
eesProf	EESProfile	M	1	The profile information of the EES.	
expTime	DateTime	O	0..1	Identifies the expiration time for the EES registration. If the expiration time is not present, then it indicates that the registration of EES never expires.	
supFeat	Supported Features	C	0..1	Used to negotiate the supported optional features of the API as described in clause 7.8. This attribute shall be provided in the HTTP POST request and in the response of successful resource creation.	

9.1.5.2.3 Type: EESProfile

Table 9.1.5.2.3-1: Definition of type EESProfile

Attribute name	Data type	P	Cardinality	Description	Applicability
eesId	string	M	1	The identifier of the EES	
endPt	EndPoint	M	1	Endpoint information (e.g. URI, FQDN, IP address) used to communicate with the EES. This information is provided to the EEC to connect to the EES.	
easIds	array(string)	O	1..N	The application identities of the Edge Application Servers (e.g. URI, FQDN) registered with the EES or expected to be registered with the EES.	
easBdlInfos	map(array(EASBundleInfo))	O	1..N(1..M)	Represents the list of EAS bundles to which each EAS among the ones identified by the "easIds" attribute belongs. The key of the map shall be the identifier of the EAS to which the provided EAS bundle information within the map value corresponds. (NOTE)	EdgeApp_2
ednInfoSets	EDNInfo	O	0..1	Contains EDN related information for the EDN where the EES resides.	EdgeApp_2
easInstInfo	map(EASInstantiationInfo)	O	1..N	Contains the EAS instantiation information for each EAS identified by the "easIds" attribute. The key of the map shall be the EAS ID to which the provided instantiation information within the map value relates.	EdgeApp_2
provId	string	O	0..1	Identifier of the ECSP that provides the EES provider.	
svcArea	ServiceArea	O	0..1	The list of geographical and topological areas that the EES serves. EECs in the UE that are outside the area shall not be served.	
appLocs	array(Dnai)	O	1..N	List of DNAI(s) associated with the EES. This is a list of potential locations of the applications. It is a subset of the DNAI(s) associated with the EDN, where the EES resides.	
svcContSupp	array(ACRS scenario)	O	1..N	The ACR scenarios supported by the EES for service continuity. If this attribute is not present, then the EES does not support service continuity.	
svcContSuppExt1	array(EASBundleInfo)	O	1..N	Represents the information related to the EES ability to handle bundled EAS ACRs. This attribute may be present only when the "svcContSupp" attribute is also present. When this attribute is present, it indicates that the EES (identified by the "eesId" attribute) is able to handle bundled EAS ACRs and contains the information of the EAS bundle(s) for which the EES is able to handle bundled EAS ACRs.	EdgeApp_2
eecRegConf	boolean	M	1	Set to "true" if the EEC is required to register on the EES to use edge services. Set to "false" if EEC is not required to register on the EES to use edge services. Default value is "false" if omitted.	
NOTE: Within each EASBundleInfo encoded map entry of this attribute, the "mainEasId" attribute shall not be present.					

9.1.5.2.4 Type: EESRegistrationPatch

Table 9.1.5.2.4-1: Definition of type EESRegistrationPatch

Attribute name	Data type	P	Cardinality	Description	Applicability
eesProf	EESProfile	O	0..1	The profile information of the EES.	
expTime	DateTimeRm	O	0..1	Identifies the expiration time for the EES registration. If the expiration time is not present, then it indicates that the registration of EES never expires.	
NOTE: The value of the "eesId" attribute within the EESProfile data type shall be the same as the one within the EES Registration data type during the creation of resource procedure.					

9.1.5.2.5 Type: ServiceArea

Table 9.1.5.2.5-1: Definition of type ServiceArea

Attribute name	Data type	P	Cardinality	Description	Applicability
topServAr	TopologicalServiceArea	O	0..1	The topological service areas. (NOTE)	
geoServAr	GeographicalServiceArea	O	0..1	The geographical service areas.	
NOTE: The "topServAr" attribute is not applicable for untrusted functional elements (EESs and/or EASs deployed outside the MNO trust domain).					

9.1.5.2.6 Type: TopologicalServiceArea

Table 9.1.5.2.6-1: Definition of type TopologicalServiceArea

Attribute name	Data type	P	Cardinality	Description	Applicability
ecgis	array(Ecgi)	O	1..N	This IE contains a list of E-UTRA cell identities.	
ncgis	array(Ncgi)	O	1..N	This IE contains a list of NR cell identities.	
tais	array(Tai)	O	1..N	This IE contains a list of tracking area identities.	
plmnIds	array(PlmnIdNid)	O	1..N	List of serving network (PLMN or SNPN) identities . For a SNPN, a NID together with a PLMN ID identifies the SNPN. (NOTE)	
NOTE: A combination of these information elements should not have duplicate or overlapping information for the same topological Service Area.					

9.1.5.2.7 Type: GeographicalServiceArea

Table 9.1.5.2.7-1: Definition of type GeographicalServiceArea

Attribute name	Data type	P	Cardinality	Description	Applicability
geoArs	array(GeographicArea)	O	1..N	Identifies a list of geographic area of the user where the UE is located.	
civicAdrs	array(CivicAddress)	O	1..N	Identifies a list of civic addresses of the user where the UE is located.	

9.1.5.2.8 Type: EASInstantiationInfo

Table 9.1.5.2.8-1: Definition of type EASInstantiationInfo

Attribute name	Data type	P	Cardinality	Description	Applicability
easId	string	M	1	The application identities of the Edge Application Servers.	
status	Instantiation Status	M	1	Contains the instantiation status of the EAS.	
instCrit	Instantiation Criteria	C	0..1	Contains the criteria information upon which the EAS can be instantiated. This attribute shall be present only when the value of the "status" attribute is set to "INSTANTIABLE".	

9.1.5.2.9 Type: InstantiationCriteria

Table 9.1.5.2.9-1: Definition of type InstantiationCriteria

Attribute name	Data type	P	Cardinality	Description	Applicability
instantiationTime	DateTime	C	0..1	Identifies the time at which the EAS shall be instantiated. (NOTE)	
instWindows	array(Time Window)	C	1..N	The time windows at which the EAS shall be instantiated. (NOTE)	
scheds	array(ScheduledCommunicationTime)	C	1..N	The schedules at which the EAS shall be instantiated. (NOTE)	
NOTE : These attributes are mutually exclusive. Either one of them shall be present.					

9.1.5.2.10 Type: EDNInfo

Table 9.1.5.2.10-1: Definition of type EDNInfo

Attribute name	Data type	P	Cardinality	Description	Applicability
dnn	Dnn	M	1	Contains the DNN identifying the EDN	
dnais	array(Dnai)	O	1..N	Contains the DNAI(s) associated with the EDN.	

9.1.5.3 Simple data types and enumerations

9.1.5.3.1 Introduction

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

9.1.5.3.2 Simple data types

The simple data types defined in table 9.1.5.3.2-1 shall be supported.

Table 9.1.5.3.2-1: Simple data types

Type Name	Type Definition	Description	Applicability

9.1.5.3.3 Enumeration: ACRScenario

The enumeration ACRScenario represents the ACR scenarios supported. It shall comply with the provisions defined in table 9.1.5.3.3-1.

Table 9.1.5.3.3-1: Enumeration ACRScenario

Enumeration value	Description	Applicability
EEC_INITIATED	Represents the EEC initiated ACR scenario.	
EEC_EXECUTED_VIA_SOURCE_EES	Represents the EEC ACR scenario executed via the S-EES.	
EEC_EXECUTED_VIA_TARGET_EES	Represents the EEC ACR scenario executed via the T-EES.	
SOURCE_EAS_DECIDED	Represents the EEC ACR scenario where the S-EAS decides to perform ACR.	
SOURCE_EES_EXECUTED	Represents the EEC ACR scenario where S-EES executes the ACR.	
EEL_MANAGED_ACR	Represents the EEC ACR scenario where the ACR is managed by the Edge Enabler Layer.	

9.1.5.3.4 Enumeration: InstantiationStatus

The enumeration InstantiationStatus represents the instantiation status of the EAS. It shall comply with the provisions defined in table 9.1.5.3.4-1.

Table 9.1.5.3.4-1: Enumeration InstantiationStatus

Enumeration value	Description	Applicability
INSTANTIATED	Indicates that the EAS is instantiated.	
INSTANTIABLE	Indicates that the EAS is instantiable but not yet instantiated.	

9.1.6 Error Handling

General error responses are defined in clause 7.7.

9.1.7 Feature negotiation

General feature negotiation procedures are defined in clause 7.8 Table 9.1.7-1 lists the supported features for Eecs_EESRegistration API.

Table 9.1.7-1: Supported Features

Feature number	Feature Name	Description
1	EdgeApp_2	This feature indicates the support of the enhancements to the Edge Applications. Within this feature, the following enhancements are covered: <ul style="list-style-type: none"> - support of EAS bundle information. - support of EAS instantiation information management. - support of EDN related information provisioning within the EES profile. - Support of the indication of the EAS ability to handle bundled EAS ACRs within the EAS profile.

9.2 Eecs_TargetEESDiscovery API

9.2.1 Introduction

The Eecs_TargetEESDiscovery service shall use the Eecs_TargetEESDiscovery API.

The API URI of the Eecs_TargetEESDiscovery API shall be:

{apiRoot}/<apiName>/<apiVersion>

The request URIs used in HTTP requests shall have the Resource URI structure as defined in clause 7.5, i.e.:

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

with the following components:

- The {apiRoot} shall be set as described in clause 7.5.
- The <apiName> shall be "eecs-targeteesdiscovery".
- The <apiVersion> shall be "v1".
- The <apiSpecificResourceUriPart> shall be set as described in clause 9.2.2.

9.2.2 Resources

9.2.2.1 Overview

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

Figure 9.2.2.1-1 depicts the resource URIs structure for the Eecs_TargetEESDiscovery API.



Figure 9.2.2.1-1: Resource URI structure of the Eecs_TargetEESDiscovery API

Table 9.2.2.1-1 provides an overview of the resources and applicable HTTP methods.

Table 9.2.2.1-1: Resources and methods overview

Resource name	Resource URI	HTTP method or custom operation	Description
EES Profiles	/ees-profiles	GET	Retrieve the target Enabler Server information.
(NOTE)	In this release of the specification, this resource is extended to manage also the CES profiles, not only the EES profiles, in order to support cloud enabler services.		

9.2.2.2 Resource: EES Profiles

9.2.2.2.1 Description

This resource allows a service consumer to retrieve the target Enabler Server information from the ECS.

9.2.2.2.2 Resource Definition

Resource URI: **{apiRoot}/eecs-targeteesdiscovery/<apiVersion>/ees-profiles**

This resource shall support the resource URI variables defined in the table 9.2.2.2.2-1.

Table 9.2.2.2-1: Resource URI variables for this resource

Name	Data Type	Definition
apiRoot	string	See clause 7.5

9.2.2.2.3 Resource Standard Methods

9.2.2.2.3.1 GET

This method allows the service consumer to fetch the target Enabler Server information as specified in 3GPP TS 23.558 [2], from the ECS with a given discovery filters.

This method shall support the URI query parameters specified in table 9.2.2.2.3.1-1.

Table 9.2.2.3.1-1: URI query parameters supported by the GET method on this resource

Name	Data type	P	Cardinality	Description	Applicability
ees-id	string	M	1	Unique identifier of the target Enabler Server.	
eas-id	string	M	1	Represents the application identifier of the source Application Server (e.g., S-EAS or CAS), e.g. URI, FQDN.	
target-dnai	Dnai	O	0..1	The DNAI information associated with the potential target Enabler Server(s) and/or target Application Server(s).	
ue-id	Gpsi	O	0..1	Identifier of the UE.	
ue-location	LocationArea5G	O	0..1	The location information of the UE.	
eec-srv-cont-supp	EECSrvContinuitySupport	O	0..1	Indicates whether the EEC supports service continuity or not and the related service continuity support information.	EdgeApp_2
ac-svc-cont-supp	array(ACRScenario)	O	1..N	Indicates that the AC supports service continuity and contains the related service continuity support information (i.e., supported ACR scenarios).	EdgeApp_2
bdl-id	string	O	0..1	Contains the identifier of the EAS bundle. This query parameter may be present only when the "bdl-type" query parameter is also present and set to "PROXY".	EdgeApp_2
bdl-type	BdlType	O	0..1	Contains the EAS bundle type.	EdgeApp_2
ens-ind	boolean	O	0..1	Indicates whether edge node sharing is requested. - When set to "true", it indicates that edge node sharing is requested. - When set to "false" (default if omitted), it indicates that node sharing is not requested.	EdgeApp_2
app-grp-id	string	O	0..1	Contains the application group identifier. When this query parameter is provided, then it indicates that the request is for the retrieval of an EES list for the announcement of common EAS.	EdgeApp_2
supp-feats	SupportedFeatures	C	0..1	Contains the list of supported feature(s) among the ones defined in clause 9.2.7. This query parameter shall be present only when feature negotiation needs to take place.	

This method shall support the request data structures specified in table 9.2.2.3.1-2 and the response data structures and response codes specified in table 9.2.2.3.1-3.

Table 9.2.2.3.1-2: Data structures supported by the GET Request Body on this resource

Data type	P	Cardinality	Description
n/a			

Table 9.2.2.3.1-3: Data structures supported by the GET Response Body on this resource

Data type	P	Cardinality	Response codes	Description
ECSServProvResp	M	1	200 OK	The EDN configuration and the target Enabler Server information determined by the ECS based on the query parameters.
NOTE: The mandatory HTTP error status code for the HTTP GET method listed in Table 5.2.6-1 of 3GPP TS 29.122 [6] shall also apply.				

9.2.2.2.4 Resource Custom Operations

None.

9.2.3 Custom Operations without associated resources

None.

9.2.4 Notifications

None.

9.2.5 Data Model

9.2.5.1 General

This clause specifies the application data model supported by the API. Data types listed in clause 7.2 apply to this API.

Table 9.2.5.1-1 specifies the data types defined specifically for the Eecs_TargetEESDiscovery API.

Table 9.2.5.1-1: Eecs_TargetEESDiscovery API specific Data Types

Data type	Section defined	Description	Applicability

Table 9.2.5.1-2 specifies data types re-used by the Eecs_TargetEESDiscovery API service.

Table 9.2.5.1-2: Re-used Data Types

Data type	Reference	Comments	Applicability
ACRScenario	Clause 9.1.5.3.3	Represents ACR scenarios.	EdgeApp_2
Dnai	3GPP TS 29.571 [8]	Used to indicate the target DNAI information.	
BdlType	Clause 8.1.5.3.6	Represent EAS Bundle type.	EdgeApp_2
EECSrvContinuitySupport	Clause 8.7.5.2.8	Represent service continuity support related information for an EEC.	EdgeApp_2
Gpsi	3GPP TS 29.571 [8]	Used to identify the UE in the query parameter.	
LocationArea5G	3GPP TS 29.122 [6]	Used to indicate the location information of the UE in the query parameter.	
ECSServProvResp	3GPP TS 24.558 [14]	The response to the target EES discovery request, which includes the EDN configuration along with list of EES(s) information.	

9.2.5.2 Structured data types

None.

9.2.5.3 Simple data types and enumerations

None.

9.2.6 Error Handling

General error responses are defined in clause 7.7.

9.2.7 Feature negotiation

General feature negotiation procedures are defined in clause 7.8. Table 9.2.7-1 lists the supported features for Eecs_TargetEESDiscovery API.

Table 9.2.7-1: Supported Features

Feature number	Feature Name	Description
1	EdgeApp_2	This feature indicates the support of the enhancements to the Edge Applications. Within this feature, the following enhancements are covered: <ul style="list-style-type: none"> - Support T-EAS discovery based on EEC service continuity information and/or AC service continuity information. - Support EAS bundle information management. - Support of requesting edge node sharing. - Support of T-EES discovery based on application group identifier.

9.3 Eecs_EASInfoManagement API

9.3.1 Introduction

The Eecs_EASInfoManagement service shall use the Eecs_EASInfoManagement API.

The API URI of the Eecs_EASInfoManagement 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 [6], 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 [6].
- The <apiName> shall be "eecs-eim".
- The <apiVersion> shall be "v1".
- The <apiSpecificSuffixes> shall be set as described in clause 5.2.4 of 3GPP TS 29.122 [6].

9.3.2 Usage of HTTP

The provisions of clause 5.2.2 of 3GPP TS 29.122 [6] shall apply for the Eecs_EASInfoManagement API.

9.3.3 Resources

9.3.3.1 Overview

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

Figure 9.3.3.1-1 depicts the resource URIs structure for the Eecs_EASInfoManagement API.

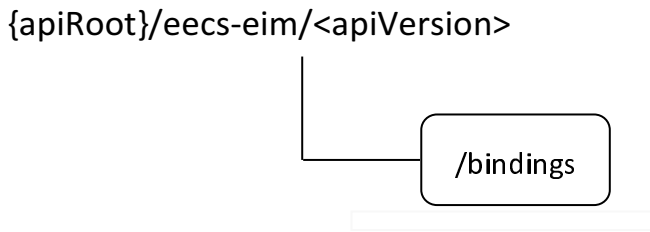


Figure 9.3.3.1-1: Resource URI structure of the Eecs_EASInfoManagement API

Table 9.3.3.1-1 provides an overview of the resources and applicable HTTP methods.

Table 9.3.3.1-1: Resources and methods overview

Resource name	Resource URI	HTTP method or custom operation	Description
Common EAS Bindings	/bindings	GET	Retrieve common EAS binding information.
		POST	Store a new common EAS binding information.

9.3.3.2 Resource: Common EAS Bindings

9.3.3.2.1 Description

This resource represents the Common EAS Bindings managed by the ECS.

9.3.3.2.2 Resource Definition

Resource URI: `{apiRoot}/eecs-eim/<apiVersion>/bindings`

This resource shall support the resource URI variables defined in the table 9.3.3.2.2-1.

Table 9.3.3.2.2-1: Resource URI variables for this resource

Name	Data Type	Definition
apiRoot	string	See clause 9.3.1.

9.3.3.2.3 Resource Standard Methods

9.3.3.2.3.1 GET

The HTTP GET method allows a service consumer to retrieve common EAS binding information.

This method shall support the URI query parameters specified in table 9.3.3.2.3.1-1.

Table 9.3.3.2.3.1-1: URI query parameters supported by the GET method on this resource

Name	Data type	P	Cardinality	Description	Applicability
requestor-id	string	M	1	Represents the identifier of the service consumer.	
app-group-id	string	M	1	Contains the application group associated with the EAS ID.	
eas-id	string	M	1	Represents the identifier of the EAS, e.g., URI, FQDN.	
supp-feats	SupportedFeatures	C	0..1	Contains the list of supported feature(s) among the ones defined in clause 9.3.8. This query parameter shall be present only when feature negotiation needs to take place.	

This method shall support the request data structures specified in table 9.3.3.2.3.1-2 and the response data structures and response codes specified in table 9.3.3.2.3.1-3.

Table 9.3.3.2.3.1-2: Data structures supported by the GET Request Body on this resource

Data type	P	Cardinality	Description
n/a			

Table 9.3.3.2.3.1-3: Data structures supported by the GET Response Body on this resource

Data type	P	Cardinality	Response codes	Description
CommonEASBindingResp	M	1	200 OK	Successful case. The requested Common EAS Binding Information stored in the ECS is returned.
n/a			204 No Content	Successful case. There is no Common EAS Binding Information corresponding to the received query parameters.
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 ECS. Redirection handling is described in clause 5.2.10 of TS 29.122 [6].
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 ECS. Redirection handling is described in clause 5.2.10 of TS 29.122 [6].
NOTE: The mandatory HTTP error status codes for the HTTP GET method listed in table 5.2.6-1 of 3GPP TS 29.122 [6] shall also apply.				

Table 9.3.3.2.3.1-4: 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 ECS.

Table 9.3.3.2.3.1-5: 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 ECS.

9.3.3.2.3.2 POST

The HTTP POST method allows a service consumer to register the common EAS binding information.

This method shall support the URI query parameters specified in table 9.3.3.2.3.2-1.

Table 9.3.3.2.3.2-1: URI query parameters supported by the POST method on this resource

Name	Data type	P	Cardinality	Description
n/a				

This method shall support the request data structures specified in table 9.3.3.2.3.2-2 and the response data structures and response codes specified in table 9.3.3.2.3.2-3.

Table 9.3.3.2.3.2-2: Data structures supported by the POST Request Body on this resource

Data type	P	Cardinality	Description
CommonEASBind Req	M	1	Represents the Common EAS Binding Information.

Table 9.3.3.2.3.2-3: Data structures supported by the POST Response Body on this resource

Data type	P	Cardinality	Response codes	Description
CommonEASBind Resp	M	1	201 Created	Successful case. The Common EAS Binding information is successfully stored.
ProblemDetailsEIMExt	O	0..1	403 Forbidden	The request is rejected because there is an existing Common EAS Binding information stored in the ECS for the application group. (NOTE 2)
NOTE 1: The mandatory HTTP error status codes for the HTTP POST method listed in Table 5.2.6-1 of 3GPP TS 29.122 [6] shall also apply.				
NOTE 2: Failure cases are described in clause 9.3.7.3.				

9.3.3.2.4 Resource Custom Operations

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

9.3.4 Custom Operations without associated resources

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

9.3.5 Notifications

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

9.3.6 Data Model

9.3.6.1 General

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

Table 9.3.6.1-1 specifies the data types defined for the Eecs_EASInfoManagement API.

Table 9.3.6.1-1: Eecs_EASInfoManagement API specific Data Types

Data type	Clause defined	Description	Applicability
CommonEASBinding	9.3.6.2.4	Represents the common EAS binding information.	
CommonEASBindReq	9.3.6.2.2	Represents the common EAS binding information registration request.	
CommonEASBindResp	9.3.6.2.3	Represents the common EAS binding information registration or retrieval response.	
ProblemDetailsEIMExt	9.3.6.4.1	Represents an extension to the ProblemDetails data structure with additional EAS Info Management related error information.	

Table 9.3.6.1-2 specifies data types re-used by the Eecs_EASInfoManagement API from other specifications, including a reference to their respective specifications and when needed, a short description of their use within the Eecs_EASInfoManagement API.

Table 9.3.6.1-2: Eecs_EASInfoManagement API re-used Data Types

Data type	Reference	Comments	Applicability
EDNInfo	Clause 9.1.5.2.10	Represent EDN related information.	
EndPoint	Clause 8.1.5.2.5	Represents the endpoint information.	
SupportedFeatures	3GPP TS 29.571 [8]	Represents the list of supported feature(s) and used to negotiate the applicability of the optional features.	

9.3.6.2 Structured data types

9.3.6.2.1 Introduction

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

9.3.6.2.2 Type: CommonEASBindReq

Table 9.3.6.2.2-1: Definition of type CommonEASBindReq

Attribute name	Data type	P	Cardinality	Description	Applicability
requestorId	string	M	1	Contains the identifier of the service consumer that is sending the request.	
binding	CommonEASBinding	M	1	Contains the common EAS Binding information.	
suppFeat	SupportedFeatures	C	0..1	Contains the list of supported feature(s) among the ones defined in clause 9.3.8. This attribute shall be present only when feature negotiation needs to take place.	

9.3.6.2.3 Type: CommonEASBindResp

Table 9.3.6.2.3-1: Definition of type CommonEASBindResp

Attribute name	Data type	P	Cardinality	Description	Applicability
binding	CommonEASBinding	M	1	Contains the common EAS Binding information.	
suppFeat	SupportedFeatures	C	0..1	Contains the list of supported feature(s) among the ones defined in clause 9.3.8. This attribute shall be present only when feature negotiation needs to take place.	

9.3.6.2.4 Type: CommonEASBinding

Table 9.3.6.2.4-1: Definition of type CommonEASBinding

Attribute name	Data type	P	Cardinality	Description	Applicability
appGroupId	string	M	1	Contains the identifier of the application group for which the common EAS binding information is provided.	
easId	string	M	1	Contains the identifier of the common EAS.	
easEndpoints	array(EndPoint)	M	1..N	Contains the endpoint(s) information of the common EAS.	
easEndpoint	EndPoint	C	0..1	Contains the endpoint information of the common EAS. Shall be provided in storage response in the POST method.	
ednInfo	EDNInfo	C	0..1	Contains the information of EDN where the common EAS resides. Shall be provided in storage request in the POST method.	

9.3.6.3 Simple data types and enumerations

9.3.6.3.1 Introduction

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

9.3.6.3.2 Simple data types

The simple data types defined in table 9.3.6.3.2-1 shall be supported.

Table 9.3.6.3.2-1: Simple data types

Type Name	Type Definition	Description	Applicability

9.3.6.4 Data types describing alternative data types or combinations of data types

9.3.6.4.1 Type: ProblemDetailsEIMExt

Table 9.3.6.4.1-1: Definition of type ProblemDetailsEIMExt as a list of to be combined data types

Data type	Cardinality	Description	Applicability
ProblemDetails	1	Represents error related information.	
CommonEASBinding	1	Represents the existing common EAS binding information for the application group.	

9.3.6.5 Binary data

9.3.6.5.1 Binary Data Types

Table 9.3.6.5.1-1: Binary Data Types

Name	Clause defined	Content type

9.3.7 Error Handling

9.3.7.1 General

For the Eecs_EASInfoManagement API, HTTP error responses shall be supported as specified in clause 5.2.6 of 3GPP TS 29.122 [6]. Protocol errors and application errors specified in clause 5.2.6 of 3GPP TS 29.122 [6] shall be supported for the HTTP status codes specified in table 5.2.6-1 of 3GPP TS 29.122 [6].

In addition, the requirements in the following clauses are applicable for the Eecs_EASInfoManagement API.

9.3.7.2 Protocol Errors

No specific protocol errors for the Eecs_EASInfoManagement API are specified.

9.3.7.3 Application Errors

The application errors defined for the Eecs_EASInfoManagement API are listed in Table 9.3.7.3-1.

Table 9.3.7.3-1: Application errors

Application Error	HTTP status code	Description	Applicability
EXISTING_COMMON_EAS	403 Forbidden	The common EAS binding information registration request is rejected because there is an existing Common EAS Binding information for the concerned application group.	

9.3.8 Feature negotiation

The optional features in table 9.3.8-1 are defined for the Eecs_EASInfoManagement API. They shall be negotiated using the extensibility mechanism defined in clause 5.2.7 of 3GPP TS 29.122 [6].

Table 9.3.8-1: Supported Features

Feature number	Feature Name	Description

9.4 Eecs_ECSServiceProvisioning API

9.4.1 Introduction

The Eecs_ECSServiceProvisioning service shall use the Eecs_ECSServiceProvisioning API.

The API URI of the Eecs_ECSServiceProvisioning 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 [6], 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 [6].
- The <apiName> shall be "eecs-esp".
- The <apiVersion> shall be "v1".
- The <apiSpecificSuffixes> shall be set as described in clause 5.2.4 of 3GPP TS 29.122 [6].

NOTE: When 3GPP TS 29.122 [6] is referenced for the common protocol and interface aspects for API definition in the clauses under clause 9.4, the ECS takes the role of the SCEF and the service consumer takes the role of the SCS/AS.

9.4.2 Usage of HTTP

The provisions of clause 5.2 of 3GPP TS 29.122 [6] shall apply for the Eecs_ECSServiceProvisioning API.

9.4.3 Resources

9.4.3.1 Overview

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

Figure 9.4.3.1-1 depicts the resource URIs structure for the Eecs_ECSServiceProvisioning API.

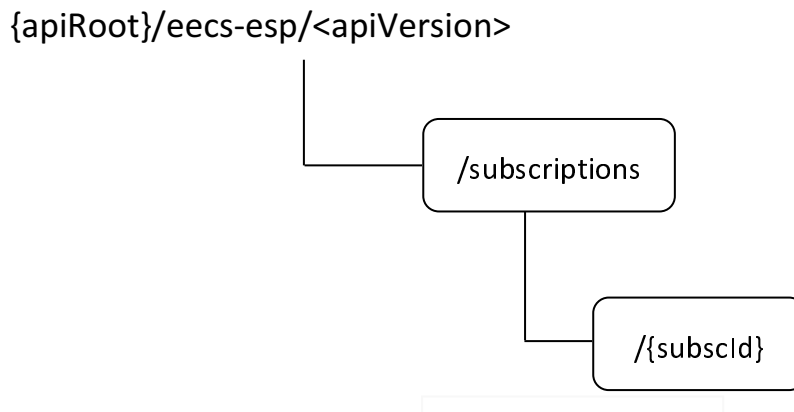


Figure 9.4.3.1-1: Resource URIs structure of the Eecs_ECSServiceProvisioning API

Table 9.4.3.1-1 provides an overview of the resources and applicable HTTP methods for the Eecs_ECSServiceProvisioning API.

Table 9.4.3.1-1: Resources and methods overview

Resource name	Resource URI	HTTP method or custom operation	Description
Service Provisioning Subscriptions	/subscriptions	POST	Request the creation of a Service Provisioning Subscription.
Individual Service Provisioning Subscription	/subscriptions/{subscld}	GET	Retrieve an existing "Individual Service Provisioning Subscription" resource.
		PUT	Request the update of an existing "Individual Service Provisioning Subscription" resource.
		PATCH	Request the modification of an existing "Individual Service Provisioning Subscription" resource.
		DELETE	Request the deletion of an existing "Individual Service Provisioning Subscription" resource.

9.4.3.2 Resource: Service Provisioning Subscriptions

9.4.3.2.1 Description

This resource represents the collection of Service Provisioning Subscriptions managed by the ECS.

9.4.3.2.2 Resource Definition

Resource URI: **{apiRoot}/eecs-esp/<apiVersion>/subscriptions**

This resource shall support the resource URI variables defined in table 9.4.3.2.2-1.

Table 9.4.3.2.2-1: Resource URI variables for this resource

Name	Data type	Definition
apiRoot	string	See clause 9.4.1.

9.4.3.2.3 Resource Standard Methods

9.4.3.2.3.2 POST

The HTTP POST method allows a service consumer to request the creation of a Service Provisioning Subscription at the ECS.

This method shall support the URI query parameters specified in table 9.4.3.2.3.2-1.

Table 9.4.3.2.3.2-1: 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 9.4.3.2.3.2-2 and the response data structures and response codes specified in table 9.4.3.2.3.2-3.

Table 9.4.3.2.3.2-2: Data structures supported by the POST Request Body on this resource

Data type	P	Cardinality	Description
ServProvSubsc	M	1	Represents the parameters to request the creation of a Service Provisioning Subscription.

Table 9.4.3.2.3.2-3: Data structures supported by the POST Response Body on this resource

Data type	P	Cardinality	Response codes	Description
ServProvSubsc	M	1	201 Created	Successful case. The Service Provisioning Subscription is successfully created and a representation of the created "Individual Service Provisioning Subscription" 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 [6] shall also apply.				

Table 9.4.3.2.3.2-4: 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}/eecs-esp/<apiVersion>/subscriptions/{subscId}

9.4.3.2.4 Resource Custom Operations

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

9.4.3.3 Resource: Individual Service Provisioning Subscription

9.4.3.3.1 Description

This resource represents a Service Provisioning Subscription managed by the ECS.

9.4.3.3.2 Resource Definition

Resource URI: {apiRoot}/eecs-esp/<apiVersion>/subscriptions/{subscId}

This resource shall support the resource URI variables defined in table 9.4.3.3.2-1.

Table 9.4.3.3.2-1: Resource URI variables for this resource

Name	Data type	Definition
apiRoot	string	See clause 9.4.1.
subscId	string	Represents the identifier of the "Individual Service Provisioning Subscription" resource.

9.4.3.3.3 Resource Standard Methods

9.4.3.3.3.1 GET

The HTTP GET method allows a service consumer to retrieve an existing "Individual Service Provisioning Subscription" resource at the ECS.

This method shall support the URI query parameters specified in table 9.4.3.3.3.1-1.

Table 9.4.3.3.3.1-1: 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 9.4.3.3.3.1-2 and the response data structures and response codes specified in table 9.4.3.3.3.1-3.

Table 9.4.3.3.3.1-2: Data structures supported by the GET Request Body on this resource

Data type	P	Cardinality	Description
n/a			

Table 9.4.3.3.3.1-3: Data structures supported by the GET Response Body on this resource

Data type	P	Cardinality	Response codes	Description
ServProvSubsc	M	1	200 OK	Successful case. The requested "Individual Service Provisioning 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 ECS. Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [6].
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 ECS. Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [6].
NOTE: The mandatory HTTP error status codes for the HTTP GET method listed in table 5.2.6-1 of 3GPP TS 29.122 [6] shall also apply.				

Table 9.4.3.3.3.1-4: 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 ECS.

Table 9.4.3.3.3.1-5: 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 ECS.

9.4.3.3.3.2 PUT

The HTTP PUT method allows a service consumer to request the update of an existing "Individual Service Provisioning Subscription" resource at the ECS.

This method shall support the URI query parameters specified in table 9.4.3.3.3.2-1.

Table 9.4.3.3.2-1: 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 9.4.3.3.2-2 and the response data structures and response codes specified in table 9.4.3.3.2-3.

Table 9.4.3.3.2-2: Data structures supported by the PUT Request Body on this resource

Data type	P	Cardinality	Description
ServProvSubsc	M	1	Represents the updated representation of the "Individual Service Provisioning Subscription" resource.

Table 9.4.3.3.2-3: Data structures supported by the PUT Response Body on this resource

Data type	P	Cardinality	Response codes	Description
ServProvSubsc	M	1	200 OK	Successful case. The "Individual Service Provisioning 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 Service Provisioning 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 ECS. Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [6].
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 ECS. Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [6].
NOTE: The mandatory HTTP error status codes for the HTTP PUT method listed in table 5.2.6-1 of 3GPP TS 29.122 [6] shall also apply.				

Table 9.4.3.3.2-4: 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 ECS.

Table 9.4.3.3.2-5: 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 ECS.

9.4.3.3.3 PATCH

The HTTP PATCH method allows a service consumer to request the modification of an existing "Individual Service Provisioning Subscription" resource at the ECS.

This method shall support the URI query parameters specified in table 9.4.3.3.3.3-1.

Table 9.4.3.3.3.3-1: 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 9.4.3.3.3.3-2 and the response data structures and response codes specified in table 9.4.3.3.3.3-3.

Table 9.4.3.3.3.3-2: Data structures supported by the PATCH Request Body on this resource

Data type	P	Cardinality	Description
ServProvSubscPatch	M	1	Represents the parameters to request the modification of the "Individual Service Provisioning Subscription" resource.

Table 9.4.3.3.3.3-3: Data structures supported by the PATCH Response Body on this resource

Data type	P	Cardinality	Response codes	Description
ServProvSubsc	M	1	200 OK	Successful case. The "Individual Service Provisioning 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 Service Provisioning 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 ECS. Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [6].
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 ECS. Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [6].
NOTE: The mandatory HTTP error status codes for the HTTP PATCH method listed in table 5.2.6-1 of 3GPP TS 29.122 [6] shall also apply.				

Table 9.4.3.3.3.3-4: 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 ECS.

Table 9.4.3.3.3.3-5: 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 ECS.

9.4.3.3.3.4 DELETE

The HTTP DELETE method allows a service consumer to request the deletion of an existing "Individual Service Provisioning Subscription" resource at the ECS.

This method shall support the URI query parameters specified in table 9.4.3.3.3.4-1.

Table 9.4.3.3.3.4-1: 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 9.4.3.3.3.4-2 and the response data structures and response codes specified in table 9.4.3.3.3.4-3.

Table 9.4.3.3.3.4-2: Data structures supported by the DELETE Request Body on this resource

Data type	P	Cardinality	Description
n/a			

Table 9.4.3.3.3.4-3: 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 Service Provisioning 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 ECS. Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [6].
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 ECS. Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [6].
NOTE: The mandatory HTTP error status codes for the HTTP DELETE method listed in table 5.2.6-1 of 3GPP TS 29.122 [6] shall also apply.				

Table 9.4.3.3.3.4-4: 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 ECS.

Table 9.4.3.3.3.4-5: 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 ECS.

9.4.4 Custom Operations without associated resources

9.4.4.1 Overview

The structure of the custom operation URIs of the Eecs_ECSServiceProvisioning API is shown in Figure 9.4.4.1-1.

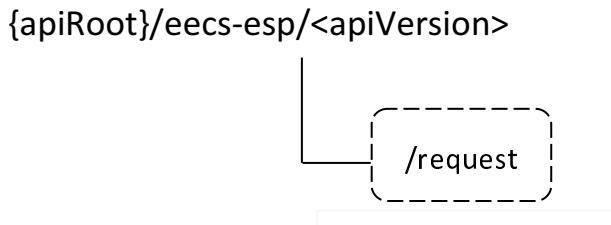


Figure 9.4.4.1-1: Custom operation URI structure of the Eecs_ECSServiceProvisioning API

Table 9.4.4.1-1 provides an overview of the custom operations and applicable HTTP methods defined for the Eecs_ECSServiceProvisioning API.

Table 9.4.4.1-1: Custom operations without associated resources

Custom operation name	Custom operation URI	Mapped HTTP method	Description
Request	/request	POST	Enables a service consumer to request service provisioning information.

The custom operations shall support the URI variables defined in table 9.4.4.1-2.

Table 9.4.4.1-2: URI variables for this custom operation

Name	Data type	Definition
apiRoot	string	See clause 9.4.1.

9.4.4.2 Operation: Request

9.4.4.2.1 Description

The custom operation enables a service consumer to request service provisioning information to the ECS.

9.4.4.2.2 Operation Definition

This operation shall support the request data structures specified in table 9.4.4.2.2-1 and the response data structures and response codes specified in table 9.4.4.2.2-2.

Table 9.4.4.2.2-1: Data structures supported by the POST Request Body on this resource

Data type	P	Cardinality	Description
ServProvReq	M	1	Contains the parameters to request service provisioning information.

Table 9.4.4.2.2-2: Data structures supported by the POST Response Body on this resource

Data type	P	Cardinality	Response codes	Description
ServProvResp	M	1	200 OK	Successful case. The requested service provisioning information shall be returned in the response body.
n/a			204 No Content	Successful case. The requested service provisioning information does not exist.
n/a			307 Temporary Redirect	Temporary redirection. The response shall include a Location header field containing an alternative target URI located in an alternative ECS. Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [6].
n/a			308 Permanent Redirect	Permanent redirection. The response shall include a Location header field containing an alternative target URI located in an alternative ECS. Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [6].
NOTE: The mandatory HTTP error status codes for the HTTP POST method listed in table 5.2.6-1 of 3GPP TS 29.122 [6] shall also apply.				

Table 9.4.4.2.2-3: Headers supported by the 307 Response Code on this resource

Name	Data type	P	Cardinality	Description
Location	string	M	1	Contains an alternative target URI located in an alternative ECS.

Table 9.4.4.2.2-4: Headers supported by the 308 Response Code on this resource

Name	Data type	P	Cardinality	Description
Location	string	M	1	Contains an alternative target URI located in an alternative ECS.

9.4.5 Notifications

9.4.5.1 General

Notifications shall comply to clause 5.2.5 of 3GPP TS 29.122 [6].

Table 9.4.5.1-1: Notifications overview

Notification	Callback URI	HTTP method or custom operation	Description (service operation)
Service Provisioning Notification	{notifUri}	POST	This service operation enables an ECS to notify a previously subscribed service consumer on service provisioning event(s).

9.4.5.2 Service Provisioning Notification

9.4.5.2.1 Description

The Service Provisioning Notification is used by the ECS to notify a previously subscribed service consumer on service provisioning event(s).

9.4.5.2.2 Target URI

The Callback URI "{notifUri}" shall be used with the callback URI variables defined in table 9.4.5.2.2-1.

Table 9.4.5.2.2-1: Callback URI variables

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

9.4.5.2.3 Standard Methods

9.4.5.2.3.1 POST

This method shall support the request data structures specified in table 9.4.5.2.3.1-1 and the response data structures and response codes specified in table 9.4.5.2.3.1-2.

Table 9.4.5.2.3.1-1: Data structures supported by the POST Request Body

Data type	P	Cardinality	Description
ServProvNotif	M	1	Represents the Service Provisioning Notification.

Table 9.4.5.2.3.1-2: Data structures supported by the POST Response Body

Data type	P	Cardinality	Response codes	Description
n/a			204 No Content	Successful case. The Service Provisioning 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 where the notification should be sent. Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [6].
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 [6].
NOTE: The mandatory HTTP error status codes for the HTTP POST method listed in table 5.2.6-1 of 3GPP TS 29.122 [6] shall also apply.				

Table 9.4.5.2.3.1-3: 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 9.4.5.2.3.1-4: 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.

9.4.6 Data Model

9.4.6.1 General

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

Table 9.4.6.1-1 specifies the data types defined for the Eecs_ECSServiceProvisioning API.

Table 9.4.6.1-1: Eecs_ECSServiceProvisioning API specific Data Types

Data type	Clause defined	Description	Applicability
FederationInfo	9.4.6.2.7	Represents federation agreements related information.	
ServProvNotif	9.4.6.2.6	Represents a Service Provisioning Notification.	
ServProvReq	9.4.6.2.2	Represents a Service Provisioning information retrieval request.	
ServProvResp	9.4.6.2.3	Represents a Service Provisioning information retrieval response.	
ServProvSubsc	9.4.6.2.4	Represents a Service Provisioning Subscription.	
ServProvSubscPatch	9.4.6.2.5	Represents the requested modifications to a Service Provisioning Subscription.	

Table 9.4.6.1-2 specifies data types re-used by the Eecs_ECSServiceProvisioning API from other specifications, including a reference to their respective specifications, and when needed, a short description of their use within the Eecs_ECSServiceProvisioning API.

Table 9.4.6.1-2: Eecs_ECSServiceProvisioning API re-used Data Types

Data type	Reference	Comments	Applicability
ACProfile	3GPP TS 24.558 [14]	Represents an AC profile.	
ConnectivityInfo	3GPP TS 24.558 [14]	Represents connectivity information.	
DateTime	3GPP TS 29.122 [6]	Represents a date and a time.	
DurationSec	3GPP TS 29.122 [6]	Represents a time duration in seconds.	
EDNConfigInfo	3GPP TS 24.558 [14]	Represents EDN related configuration information.	
LocationInfo	3GPP TS 29.122 [6]	Represents 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.	
Uri	3GPP TS 29.122 [6]	Represents a time duration.	

9.4.6.2 Structured data types

9.4.6.2.1 Introduction

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

9.4.6.2.2 Type: ServProvReq

Table 9.4.6.2.2-1: Definition of type ServProvReq

Attribute name	Data type	P	Cardinality	Description	Applicability
fedInfo	array(FederationInfo)	O	1..N	Contains list of federation agreements related information.	
acProfs	array(ACProfile)	O	1..N	Contains the AC profile(s) information indicating the required service(s).	
connInfo	array(ConnectivityInfo)	O	1..N	Contains the set(s) of connectivity information where the services are required.	
locInfo	LocationInfo	O	0..1	Contains the location information of the concerned UE.	
suppFeat	SupportedFeatures	C	0..1	Contains the list of supported features among the ones defined in clause 9.4.8. This attribute shall be present only when feature negotiation needs to take place.	

9.4.6.2.3 Type: ServProvResp

Table 9.4.6.2.3-1: Definition of type ServProvResp

Attribute name	Data type	P	Cardinality	Description	Applicability
ednConfigInfo	array(EDNConfigInfo)	M	1..N	Contains the list of EDN configuration information.	
suppFeat	SupportedFeatures	C	0..1	Contains the list of supported features among the ones defined in clause 9.4.8. This attribute shall be present only when feature negotiation needs to take place.	

9.4.6.2.4 Type: ServProvSubsc

Table 9.4.6.2.4-1: Definition of type ServProvSubsc

Attribute name	Data type	P	Cardinality	Description	Applicability
notifUri	Uri	M	1	Contains the URI via which the service provisioning event(s) notifications shall be delivered.	
fedInfo	array(FederationInfo)	O	1..N	Contains list of federation agreements related information.	
acProfs	array(ACProfile)	O	1..N	Contains the AC profile(s) information indicating the required service(s).	
connInfo	array(ConnectivityInfo)	O	1..N	Contains the set(s) of connectivity information where the services are required.	
locInfo	LocationInfo	O	0..1	Contains the location information of the concerned UE.	
expTime	DateTime	O	0..1	Contains the expiration time of the subscription. If this attribute is not present, this means that the subscription does not expires until explicitly terminated by the service consumer.	
suppFeat	SupportedFeatures	C	0..1	Contains the list of supported features among the ones defined in clause 9.4.8. This attribute shall be present only when feature negotiation needs to take place.	

9.4.6.2.5 Type: ServProvSubscPatch

Table 9.4.6.2.5-1: Definition of type ServProvSubscPatch

Attribute name	Data type	P	Cardinality	Description	Applicability
notifUri	Uri	O	0..1	Contains the updated URI via which the service provisioning event(s) notifications shall be delivered.	
fedInfo	array(FederationInfo)	O	1..N	Contains the updated list of federation agreements related information.	
acProfs	array(ACProfile)	O	1..N	Contains the updated AC profile(s) information indicating the required services.	
connInfo	array(ConnectivityInfo)	O	1..N	Contains the updated set(s) of connectivity information where the services are required.	
locInfo	LocationInfo	O	0..1	Contains the updated location information of the concerned UE.	
expTime	DateTime	O	0..1	Contains the updated expiration time of the subscription.	

9.4.6.2.6 Type: ServProvNotif

Table 9.4.6.2.6-1: Definition of type ServProvNotif

Attribute name	Data type	P	Cardinality	Description	Applicability
subscId	string	M	1	Contains the identifier of the subscription to which the notification is related.	
ednConfigInfo	array(EDNConfigInfo)	M	1..N	Contains the list of EDN configuration information.	
lifetime	DurationSec	O	0..1	Contains the time duration that the the provided EDN configuration information can be cached.	

9.4.6.2.7 Type: FederationInfo

Table 9.4.6.2.7-1: Definition of type FederationInfo

Attribute name	Data type	P	Cardinality	Description	Applicability
federationId	string	M	1	Contains the identifier of the federation.	

9.4.6.3 Simple data types and enumerations

9.4.6.3.1 Introduction

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

9.4.6.3.2 Simple data types

The simple data types defined in table 9.4.6.3.2-1 shall be supported.

Table 9.4.6.3.2-1: Simple data types

Type Name	Type Definition	Description	Applicability

9.4.6.4 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.

9.4.6.5 Binary data

9.4.6.5.1 Binary Data Types

Table 9.4.6.5.1-1: Binary Data Types

Name	Clause defined	Content type

9.4.7 Error Handling

9.4.7.1 General

For the Eecs_ECSServiceProvisioning API, HTTP error responses shall be supported as specified in clause 5.2.6 of 3GPP TS 29.122 [6]. Protocol errors and application errors specified in clause 5.2.6 of 3GPP TS 29.122 [6] shall be supported for the HTTP status codes specified in table 5.2.6-1 of 3GPP TS 29.122 [6].

In addition, the requirements in the following clauses are applicable for the Eecs_ECSServiceProvisioning API.

9.4.7.2 Protocol Errors

No specific protocol errors for the Eecs_ECSServiceProvisioning API are specified.

9.4.7.3 Application Errors

The application errors defined for the Eecs_ECSServiceProvisioning API are listed in Table 9.4.7.3-1.

Table 9.4.7.3-1: Application errors

Application Error	HTTP status code	Description	Applicability

9.4.8 Feature negotiation

The optional features listed in table 9.4.8-1 are defined for the Eecs_ECSServiceProvisioning API. They shall be negotiated using the extensibility mechanism defined in clause 5.2.7 of 3GPP TS 29.122 [6].

Table 9.4.8-1: Supported Features

Feature number	Feature Name	Description

9.4.9 Security

The provisions of clause 6 of 3GPP TS 29.122 [6] shall apply for the Eecs_ECSServiceProvisioning API.

9.5 Eecs_ECSDiscovery API

9.5.1 Introduction

The Eecs_ECSDiscovery service shall use the Eecs_ECSDiscovery API.

The API URI of the Eecs_ECSDiscovery API shall be:

{apiRoot}/<apiName>/<apiVersion>

The request URIs used in HTTP requests shall have the Resource URI structure as defined in clause 5.2.4 of 3GPP TS 29.122 [6], i.e.:

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

with the following components:

- The {apiRoot} shall be set as described in clause 5.2.4 of 3GPP TS 29.122 [6].
- The <apiName> shall be "eecs-ecsdiscovers".
- The <apiVersion> shall be "v1".
- The <apiSpecificResourceUriPart> shall be set as described in clause 5.2.4 of 3GPP TS 29.122 [6].

9.5.2 Resources

9.5.2.1 Overview

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

Figure 9.5.2.1-1 depicts the resource URIs structure for the Eecs_ECSDiscovery API.

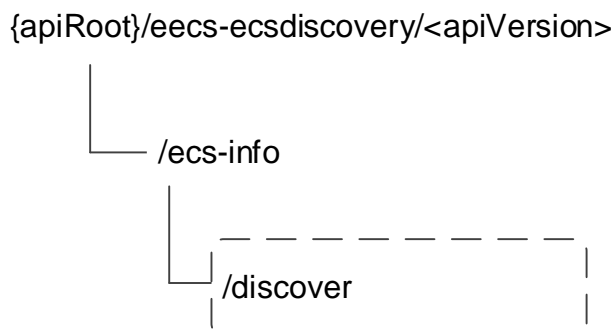


Figure 9.5.2.1-1: Resource URI structure of the Eecs_ECSDiscovery API

Table 9.5.2.1-1 provides an overview of the resources and applicable HTTP methods.

Table 9.5.2.1-1: Resources and methods overview

Resource name	Resource URI	HTTP method or custom operation	Description
ECS Information	/ecs-info	Discover	Retrieve partner ECS information.

9.5.2.2 Resource: ECS Information

9.5.2.2.1 Description

This resource represents the collection of ECS Information managed by the ECS.

9.5.2.2.2 Resource Definition

Resource URI: **{apiRoot}/eecs-ecsdiscovery/<apiVersion>/ecs-info**

This resource shall support the resource URI variables defined in the table 9.5.2.2.2-1.

Table 9.5.2.2.2-1: Resource URI variables for this resource

Name	Data Type	Definition
apiRoot	string	See clause 9.5.1.

9.5.2.2.3 Resource Standard Methods

There are no resource standard methods defined for this resource in this release of the specification.

9.5.2.2.4 Resource Custom Operations

9.5.2.2.4.1 Overview

Table 9.5.2.4.1-1 specifies the custom operations defined on this resource.

Table 9.5.2.4.1-1: Custom operations

Operation name	Custom operation URI	Mapped HTTP method	Description
Discover	/ecs-info/discover	POST	Request partner ECS information

9.5.2.2.4.2 Operation: Discover

9.5.2.2.4.2.1 Description

The custom operation allows a service consumer to request ECS information from the ECS.

9.5.2.2.4.2.2 Operation Definition

This operation shall support the request of data structures specified in table 9.5.2.2.4.2.2-1 and the response data structure and response codes specified in table 9.5.2.2.4.2.2-2.

Table 9.5.2.2.4.2.2-1: Data structures supported by the POST Request Body on this resource

Data type	P	Cardinality	Description
ECSInfoDiscovery Req	M	1	Contains the necessary information to request ECS information.

Table 9.5.2.2.4.2.2-2: Data structures supported by the POST Response Body on this resource

Data type	P	Cardinality	Response codes	Description
ECSInfoDiscoveryResp	M	1	200 OK	The requested ECS discovery information was successfully returned.
n/a			204 No Content	The processing of the request is successful but no matching ECS was found.
n/a			307 Temporary Redirect	Temporary redirection. The response shall include a Location header field containing an alternative URI of the resource custom operation located in an alternative ECS. 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 of the resource custom operation located in an alternative ECS. Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [3].

NOTE: The mandatory HTTP error status code for the POST method listed in Table 5.2.6-1 of 3GPP TS 29.122 [3] also apply.

Table 9.5.2.2.4.2.2-3: Headers supported by the 307 Response Code on this resource custom operation

Name	Data type	P	Cardinality	Description
Location	string	M	1	Contains an alternative URI of the resource custom operation located in an alternative ECS.

Table 9.5.2.2.4.2.2-4: Headers supported by the 308 Response Code on this resource custom operation

Name	Data type	P	Cardinality	Description
Location	string	M	1	Contains an alternative URI of the resource custom operation located in an alternative ECS.

9.5.3 Custom Operations without associated resources

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

9.5.4 Notifications

9.5.4.1 General

Table 9.5.4.1-1: Notifications overview

Notification	Callback URI	HTTP method or custom operation	Description (service operation)
ECS Discovery Notification	{notifUri}	POST	Enables the ECS to notify a previously subscribed service consumer on partner ECS information.

9.5.4.2 ECS Discovery Notification

9.5.4.2.1 Description

The ECS Discovery Notification service operation is used by the ECS to notify a previously subscribed service consumer on partner ECS information.

9.5.4.2.2 Target URI

The callback URI {**notifUri**} shall be used with the callback URI variables defined in table 9.5.4.2.2-1.

Table 9.5.4.2.2-1: Callback URI variables

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

9.5.4.2.3 Standard Methods

9.5.4.2.3.1 POST

This method shall support the request data structures specified in table 9.5.4.2.3.1-1 and the response data structures and response codes specified in table 9.5.4.2.3.1-2.

Table 9.5.4.2.3.1-1: Data structures supported by the POST Request Body on this resource

Data type	P	Cardinality	Description
EcsInfoDiscNotif	M	1	Notification of ECS information.

Table 9.5.4.2.3.1-2: Data structures supported by the POST Response Body on this resource

Data type	P	Cardinality	Response codes	Description
n/a			204 No Content	Successful case. The notification is successfully received and acknowledged.
n/a			307 Temporary Redirect	Temporary redirection. The response shall include a Location header field containing an alternative target 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 TS 29.122 [6].
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 TS 29.122 [6].
NOTE: The mandatory HTTP error status codes for the HTTP POST method listed in Table 5.2.6-1 of 3GPP TS 29.122 [6] shall also apply.				

Table 9.5.4.4.3.1-3: Headers supported by the 307 Response Code on this resource

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

Table 9.5.4.4.3.1-4: Headers supported by the 308 Response Code on this resource

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

9.5.5 Data Model

9.5.5.1 General

This clause specifies the application data model supported by the API. Data types listed in clause 7.2 apply to this API.

Table 9.5.5.1-1 specifies the data types defined specifically for the Eecs_ECSDiscovery API.

Table 9.5.5.1-1: Eecs_ECSDiscovery API specific Data Types

Data type	Section defined	Description	Applicability
EcsInfo	9.5.5.2.4	Represents the discovered ECS information.	
EcsInfoDiscNotif	9.5.5.2.9	Represents the ECS Discovery notification information	
EcsInfoDiscoveryReq	9.5.5.2.2	Represents the ECS Discovery request information.	
EcsInfoDiscoveryResp	9.5.5.2.3	Represents the ECS Discovery response information.	
ECSPProfile	9.4.5.2.5	Represents the profile information related to the ECS in the ECSRegistration data type.	
PduConfiguration	9.4.5.2.6	Represents information to establish PDU session with ECS.	
SupportedEcsp	9.4.5.2.7	Represents the ECSP Information associated to PLMN.	
SupportedPlmn	9.4.5.2.8	Represents the PLMN information.	

Table 9.5.5.1-2 specifies data types re-used by the Eecs_ECSDiscovery API service, including a reference to their respective specifications, and when needed, a short description of their use within the Eecs_ECSDiscovery API.

Table 9.5.5.1-2: Eecs_ECSDiscovery re-used Data Types

Data type	Reference	Comments	Applicability
ACProfile	3GPP TS 24.558 [14]	Represents the AC profiles filter information.	
ConnectivityInfo	3GPP TS 24.558 [14]	Represents to represent the connectivity information of the UE.	
DateTime	3GPP TS 29.122 [6]	Represents a date and a time.	
DateTimeRm	3GPP TS 29.571 [8]	Represents the expiration time in ECS registration patch.	
Dnn	3GPP TS 29.571 [8]	Represents the Dnn information	
EndPoint	8.1.5.2.5	Represents the end point information of the ECS in the ECS profile.	
LocationInfo	3GPP TS 29.122 [6]	Represents the location information of the UE in the ECS discovery request and subscriptions.	
PlmnlidNid	3GPP TS 29. 571 [8]	Represents the network, i.e., PLMN Identifier or the SNPN Identifier (the PLMN Identifier and the NID). Used to indicate the PLMN supporting information in ECS profile.	
Snssai	3GPP TS 29.571 [8]	Represents the Snssai information.	
SpatialValidityCond	3GPP TS 29.571 [8]	Represents the spatial validity conditions.	
SupportedFeatures	3GPP TS 29.571 [8]	Represents the list of supported feature(s) and used to negotiate the applicability of the optional features.	

9.5.5.2 Structured data types

9.5.5.2.1 Introduction

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

9.5.5.2.2 Type: EcsInfoDiscoveryReq

Table 9.5.5.2.2-1: Definition of type EcsInfoDiscoveryReq

Attribute name	Data type	P	Cardinality	Description	Applicability
ecsAddr	EndPoint	M	1	Represents end point information (e.g. URI, FQDN, IP address) of the requesting ECS.	
acProfs	array(ACProfile)	O	1..N	AC Profiles filter information about the required services.	
connInf	array(ConnectivityInfo)	O	1..N	List of connectivity information for the UE.	
ueLoc	LocationInfo	O	0..1	Location information of the UE for which the services are required.	
notifUri	Uri	O	0..1	Contains the URI via which the ECS Discovery notifications shall be delivered.	
duration	DateTime	O	0..1	Represents the time duration over which the service consumer expects the ECS to provide ECS Discovery notifications.	
suppFeat	SupportedFeatures	C	0..1	Represents a list of Supported features used as described in clause 9.5.7. This attribute shall be present only when feature negotiation needs to take place.	

9.5.5.2.3 Type: EcsInfoDiscoveryResp

Table 9.5.5.2.3-1: Definition of type EcsInfoDiscoveryResp

Attribute name	Data type	P	Cardinality	Description	Applicability
ecsInfo	array(EcsInfo)	M	1..N	Contains the list of partner ECS information.	

9.5.5.2.4 Type: EcsInfo

Table 9.5.5.2.4-1: Definition of type EcsInfo

Attribute name	Data type	P	Cardinality	Description	Applicability
ecs	ECSProfile	M	1	Contains the ECS profile information.	
lifeTime	DateTime	O	0..1	Indicates the time duration for which the provided ECS information is valid.	

9.4.5.2.5 Type: ECSPProfile

Table 9.4.5.2.5-1: Definition of type ECSPProfile

Attribute name	Data type	P	Cardinality	Description	Applicability
endPt	EndPoint	M	1	Endpoint information (e.g. URI, FQDN, IP address) used to communicate with the ECS.	
ecspId	string	O	0..1	The identifier of the ECSP (e.g. the mobile network operator or 3rd party service provider) that provides the ECS.	
splVal	SpatialValidityCond	O	0..1	The spatial validity conditions.	
suppPlmns	array(SupportedPlmn)	O	1..N	List of PLMNs and the associated ECSPs for which the ECS can provide the EDN configuration information.	

9.4.5.2.6 Type: SupportedPlmn

Table 9.4.5.2.6-1: Definition of type SupportedPlmn

Attribute name	Data type	P	Cardinality	Description	Applicability
plmnId	PlmnIdNid	O	0..1	The identifier of the PLMN for which EDN configuration information can be provided by ECS.	
suppEcsp	array(SupportedEcsp)	O	1..N	The information of ECSP(s) associated to the PLMN identified by "plmnId" attribute.	
pduConf	PduConfiguration	O	0..1	DNN and S-NSSAI information for roaming UEs to establish PDU sessions with the ECS.	

9.4.5.2.7 Type: SupportedEcsp

Table 9.4.5.2.7-1: Definition of type SupportedEcsp

Attribute name	Data type	P	Cardinality	Description	Applicability
ecspId	string	M	1	The identifier of an ECSP	
easIds	array(string)	M	1..N	The list of EAS IDs available or expected to be available through the ECSP identified by "ecspId" attribute.	

9.4.5.2.8 Type: PduConfiguration

Table 9.4.5.2.8-1: Definition of type PduConfiguration

Attribute name	Data type	P	Cardinality	Description	Applicability
snsai	Snsai	M	1	Indicates the S-NSSAI information to establish PDU sessions with the ECS.	
dnn	Dnn	M	1	Indicates the DNN information to establish PDU sessions with the ECS.	

9.5.5.2.9 Type: EcsInfoDiscNotif

Table 9.5.5.2.9-1: Definition of type EcsInfoDiscoveryNotification

Attribute name	Data type	P	Cardinality	Description	Applicability
ecsInfo	array(EcsInfo)	M	1..N	Contains the list of partner ECS information.	

9.5.5.3 Simple data types and enumerations

9.5.5.3.1 Introduction

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

9.5.5.3.2 Simple data types

The simple data types defined in table 9.5.5.3.2-1 shall be supported.

Table 9.5.5.3.2-1: Simple data types

Type Name	Type Definition	Description	Applicability

9.5.5.4 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.

9.5.5.5 Binary data

9.5.5.5.1 Binary Data Types

Table 9.5.5.5.1-1: Binary Data Types

Name	Clause defined	Content type

9.5.6 Error Handling

9.5.6.1 General

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

In addition, the requirements in the following clauses are applicable for the Eecs_ECSDiscovery API.

9.5.6.2 Protocol Errors

No specific protocol errors for the Eecs_ECSDiscovery API are specified.

9.5.6.3 Application Errors

The application errors defined for the Eecs_ECSDiscovery service are listed in Table 9.5.6.3-1.

Table 9.5.6.1-1: Application errors

Application Error	HTTP status code	Description

9.5.7 Feature negotiation

General feature negotiation procedures are defined in clause 7.8. Table 9.5.7-1 lists the supported features for Eecs_ECSDiscovery API.

Table 9.5.7-1: Supported Features

Feature number	Feature Name	Description

10 Using Common API Framework

10.1 General

EES may expose its services to EAS with support of CAPIF. Also, the EES may also re-expose the network capabilities of the 3GPP core network to the EAS(s) with support of CAPIF architecture, as specified in 3GPP TS 23.558 [2]. When CAPIF is used with EES services, the EES shall support the following as defined in 3GPP TS 29.222 [17]:

- the API exposing function and related APIs over CAPIF-2/2e and CAPIF-3/3e reference points;
- the API publishing function and related APIs over CAPIF-4/4e reference point;
- the API management function and related APIs over CAPIF-5/5e reference point; and
- at least one of the security methods for authentication and authorization, and related security mechanisms.

The EAS supports the role of API Invoker as specified in 3GPP TS 29.222 [17]. In a centralized deployment as defined in 3GPP TS 23.222 [17], where the CAPIF core function and API provider domain functions are co-located, the interactions between the CAPIF core function and API provider domain functions may be independent of CAPIF-3/3e, CAPIF-4/4e and CAPIF-5/5e reference points.

When CAPIF is used with an EES service, the EES shall register all the features for northbound APIs in the CAPIF Core Function.

The EAS may expose its services to other EAS(s) using CAPIF as specified in 3GPP TS 23.558 [2]. When CAPIF is used for exposure of EAS services to other EAS(s), the above procedure shall be applicable with the following differences:

- the provisions related to the EES apply to the EAS;
- the provisions related to the EAS apply to the other EAS(s) as consumer(s) of the exposed EAS service APIs.

10.2 Security

When CAPIF is used for external exposure of EES services to EAS, before invoking the API exposed by the EES, the EAS as API invoker shall negotiate the security method (PKI, TLS-PSK or OAUTH2) with CAPIF core function and ensure the EAS has enough credential to authenticate the EAS (see 3GPP TS 29.222 [17], clause 5.6.2.2 and clause 6.2.2.2).

If PKI or TLS-PSK is used as the selected security method between the EAS and the EES, upon API invocation, the EES shall retrieve the authorization information from the CAPIF core function as described in 3GPP TS 29.222 [17], clause 5.6.2.4.

As indicated in 3GPP TS 33.122 [18], the access to the EES APIs may be authorized by means of the OAuth2 protocol (see IETF RFC 6749 [19]), where the CAPIF core function (see 3GPP TS 29.222 [17]) plays the role of the authorization server.

If OAuth2 is used as the selected security method between the EAS and the EES, then the EAS, prior to consuming services offered by the EES APIs, shall obtain a "token" from the authorization server, by invoking the Obtain_Authorization service, as described in 3GPP TS 29.222 [17], clause 5.6.2.3.2.

The EES APIs do not define any scopes for OAuth2 authorization. It is the EES responsibility to check whether the EAS is authorized to use an API based on the "token". Once the EES verifies the "token", it shall check whether the EES 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 EAS has full authority to access any resource or operation for the invoked API

NOTE: For aforementioned security methods, the EES needs to apply admission control according to access control policies after performing the authorization checks.

When CAPIF is used for exposure of EAS services to other EAS(s), the above security procedure shall be applicable with the following differences:

- the provisions related to the EES apply to the EAS;
- the provisions related to the EAS apply to the other EAS(s) as consumer(s) of the exposed EAS service APIs.

11 Security

The authentication and authorization between EES and ECS shall be as specified in 3GPP TS 33.558 [20].

The authentication and authorization in EES capability exposure shall be as specified in 3GPP TS 33.558 [20]. When CAPIF is used, the aspects specified in clause 10 shall be used.

The security credentials to be used for verification and authorization of various API requests from EAS and EES shall be as specified in 3GPP TS 33.558 [20].

Annex A (normative): OpenAPI specification

A.1 General

This annex is based on the OpenAPI 3.0.0 specification [3] and provides corresponding representations of all APIs defined in the present specification in YAML format.

This Annex shall take precedence when being discrepant to other parts of the specification with respect to the encoding of information elements and methods within the API.

NOTE: 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 file contained in this 3GPP Technical Specification are available on a Git-based repository that uses the GitLab software version control system (see clause 5B of the 3GPP TR 21.900 [4] and clause 5.3.1 of the 3GPP TS 29.501 [5] for further information).

A.2 Ees_EASRegistration API

```
openapi: 3.0.0
```

```
info:
```

```
  title: EES EAS Registration_API
  description: |
    API for EAS Registration.
    © 2024, 3GPP Organizational Partners (ARIB, ATIS, CCSA, ETSI, TSDSI, TTA, TTC).
    All rights reserved.
  version: 1.1.0
```

```
externalDocs:
```

```
  description: >
    3GPP TS 29.558 V18.6.0 Enabling Edge Applications;
    Application Programming Interface (API) specification; Stage 3
  url: https://www.3gpp.org/ftp/Specs/archive/29_series/29.558/
```

```
servers:
```

```
- url: '{apiRoot}/ees-easregistration/v1'
  variables:
    apiRoot:
      default: https://example.com
      description: apiRoot as defined in clause 7.5 of 3GPP TS 29.558.
```

```
security:
```

```
- {}
- oAuth2ClientCredentials: []
```

```
paths:
```

```
  /registrations:
    post:
      summary: Creates a new Individual EAS Registration resource
      operationId: CreateEASRegistration
      tags:
        - EAS Registrations (Collection)
      description: Registers a new EAS at an EES.
      requestBody:
        required: true
        content:
          application/json:
            schema:
              $ref: '#/components/schemas/EASRegistration'
      responses:
        '201':
          description: EAS information is registered successfully at EES.
          content:
            application/json:
```

```

    schema:
      $ref: '#/components/schemas/EASRegistration'
  headers:
    Location:
      description: 'Contains the URI of the newly created 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'

/registrations/{registrationId}:
  get:
    summary: Read an Individual EAS Registration resource
    operationId: ReadIndEASRegistration
    tags:
      - Individual EAS Registration (Document)
    description: Retrieve an Individual EAS registration resource.
    parameters:
      - name: registrationId
        in: path
        description: Registration Id.
        required: true
        schema:
          type: string
    responses:
      '200':
        description: OK (The EAS registration information at the EES).
        content:
          application/json:
            schema:
              $ref: '#/components/schemas/EASRegistration'
      '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: Update an Individual EAS Registration resource
    operationId: UpdateIndEASRegistration

```

```

tags:
- Individual EAS Registration (Document)
description: Fully replace an existing EAS Registration resource.
parameters:
- name: registrationId
  in: path
  description: EAS registration Id.
  required: true
  schema:
    type: string
requestBody:
  required: true
  content:
    application/json:
      schema:
        $ref: '#/components/schemas/EASRegistration'
responses:
'200':
  description: OK (The EAS registration information is updated successfully).
  content:
    application/json:
      schema:
        $ref: '#/components/schemas/EASRegistration'
'204':
  description: >
    No Content. The individual EAS registration information is updated successfully.
'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: Modify an Individual EAS Registration resource
operationId: ModifyIndEASRegistration
tags:
- Individual EAS Registration (Document)
description: Partially update an existing EAS Registration resource.
parameters:
- name: registrationId
  in: path
  description: EAS registration Id.
  required: true
  schema:
    type: string
requestBody:
  description: Partial update of an existing EAS registration resource.
  required: true
  content:
    application/merge-patch+json:
      schema:
        $ref: '#/components/schemas/EASRegistrationPatch'
responses:
'200':
  description: >
    The Individual EAS registration is successfully modified and the updated
    registration information is returned in the response.

```

```

content:
  application/json:
    schema:
      $ref: '#/components/schemas/EASRegistration'
'204':
  description: >
    No Content. The individual EAS registration information is updated successfully.
'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: Delete an Individual EAS Registration resource
operationId: DeleteIndEASRegistration
tags:
  - Individual EAS Registration (Document)
description: Delete an existing EAS registration at EES.
parameters:
  - name: registrationId
    in: path
    description: EAS registration Id.
    required: true
    schema:
      type: string
responses:
'204':
  description: The individual EAS registration is 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:
  EASRegistration:
    type: object
    description: Represents an EAS registration information.
    properties:
      easProf:
        $ref: '#/components/schemas/EASProfile'
      expTime:
        $ref: 'TS29122_CommonData.yaml#/components/schemas/DateTime'
      suppFeat:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/SupportedFeatures'
    required:
      - easProf

  EASProfile:
    type: object
    description: Represents the EAS profile information.
    properties:
      easId:
        type: string
        description: Identifier of the EAS.
      endPt:
        $ref: '#/components/schemas/EndPoint'
      allowedPlmnId:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/PlmnIdNid'
      easBdlInfos:
        type: array
        items:
          $ref: '#/components/schemas/EASBundleInfo'
        minItems: 1
      acIds:
        type: array
        items:
          type: string
        minItems: 1
        description: Identities of application clients that are served by the EAS.
      provId:
        type: string
        description: Identifier of the ASP that provides the EAS.
      type:
        $ref: '#/components/schemas/EASCategory'
      flexEasType:
        type: string
        description: The EAS type with flexible value set.
      scheds:
        type: array
        items:
          $ref: 'TS29122_CpProvisioning.yaml#/components/schemas/ScheduledCommunicationTime'
        minItems: 1
        description: The availability schedule of the EAS.
      svcArea:
        $ref: 'TS29558_Eecs_EESRegistration.yaml#/components/schemas/ServiceArea'
      svcKpi:
        $ref: '#/components/schemas/EASServiceKPI'
      permLvl:
        type: array
        items:
          $ref: '#/components/schemas/PermissionLevel'
        minItems: 1
        description: level of service permissions supported by the EAS.
      easFeats:
        type: array
        items:
          type: string
        minItems: 1
        description: Service specific features supported by EAS.
      appLocs:
        type: array
        items:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/RouteToLocation'
        minItems: 1
        description: List of DNAI(s) and the N6 traffic information associated with the EAS.
      svcContSupp:
        type: array
        items:
          $ref: 'TS29558_Eecs_EESRegistration.yaml#/components/schemas/ACRScenario'

```

```

    minItems: 1
    description: The ACR scenarios supported by the EAS for service continuity.
  svcContSuppExt1:
    type: array
    items:
      $ref: '#/components/schemas/EASBundleInfo'
    minItems: 1
    description: >
      Represents the information related to the EAS ability to handle bundled EAS ACRs.
      This attribute may be present only when the "svcContSupp" attribute is also present.
      When this attribute is present, it indicates that the EAS (identified by the "easId"
      attribute) is able to handle bundled EAS ACRs and contains the information of the EAS
      bundle(s) for which the EAS is able to handle bundled EAS ACRs.
  transContSupp:
    $ref: '#/components/schemas/TransContSuppDetails'
  avlRep:
    $ref: 'TS29122_CommonData.yaml#/components/schemas/DurationSec'
  status:
    type: string
    description: EAS status information.
  genCtxDur:
    $ref: 'TS29122_CommonData.yaml#/components/schemas/DurationSec'
  easSyncSupp:
    type: boolean
    default: false
    description: >
      Set to true to indicate that content synchronization between EASs is supported.
      Set to false to indicate that content synchronization between EASs is not supported.
      The default value when this attribute is omitted is false.
  required:
    - easId
    - endPt
  not:
    required: [ type, flexEasType ]

EASRegistrationPatch:
  type: object
  description: Represents partial update request of individual EAS registration information.
  properties:
    easProf:
      $ref: '#/components/schemas/EASProfile'
    expTime:
      $ref: 'TS29571_CommonData.yaml#/components/schemas/DateTimeRm'

EASServiceKPI:
  type: object
  description: Represents the EAS service KPI information.
  properties:
    maxReqRate:
      $ref: 'TS29571_CommonData.yaml#/components/schemas/UInteger'
    maxRespTime:
      $ref: 'TS29571_CommonData.yaml#/components/schemas/UInteger'
    avail:
      $ref: 'TS29571_CommonData.yaml#/components/schemas/UInteger'
    avlComp:
      $ref: 'TS29571_CommonData.yaml#/components/schemas/UInteger'
    avlGraComp:
      $ref: 'TS29571_CommonData.yaml#/components/schemas/UInteger'
    avlMem:
      $ref: 'TS29571_CommonData.yaml#/components/schemas/UInteger'
    avlStrg:
      $ref: 'TS29571_CommonData.yaml#/components/schemas/UInteger'
    connBand:
      $ref: 'TS29571_CommonData.yaml#/components/schemas/BitRate'

EASBundleInfo:
  type: object
  description: Represents the EAS bundle information.
  properties:
    bdlType:
      $ref: '#/components/schemas/BdlType'
    bdlId:
      type: string
      description: Indicates a bundle ID.
    easIdsList:
      type: array
      items:
        type: string

```

```

    minItems: 1
    easBdlReqs:
      $ref: '#/components/schemas/EASBdlReqs'
    mainEasId:
      type: string
    required:
      - bdlType
    anyOf:
      - required: [bdId]
      - required: [easIdsList]

EASBdlReqs:
  type: object
  description: Represents the EAS bundle requirements.
  properties:
    coordinatedEasDisc:
      type: boolean
      default: false
      description: >
        Set to true to indicate that coordinated EAS discovery is required.
        Set to false to indicate that coordinated EAS discovery is not required.
        The default value when this attribute is omitted is false.
    coordinatedAcr:
      $ref: '#/components/schemas/CoordinatedAcrReqs'
    affinity:
      $ref: '#/components/schemas/Affinity'

CoordinatedAcrReqs:
  type: object
  description: Represents the coordinated ACR related requirements for an EAS bundle.
  properties:
    coordinatedAcrInd:
      type: boolean
      default: false
      description: >
        Set to true to indicate that coordinated ACR is required.
        Set to false to indicate that coordinated ACR is not required.
        The default value when this attribute is omitted is false.
    failureAction:
      $ref: '#/components/schemas/FailureAction'
  required:
    - coordinatedAcrInd

EndPoint:
  type: object
  description: The end point information to reach EAS.
  properties:
    fqdn:
      $ref: 'TS29571_CommonData.yaml#/components/schemas/Fqdn'
    ipv4Addrs:
      type: array
      items:
        $ref: 'TS29122_CommonData.yaml#/components/schemas/Ipv4Addr'
      minItems: 1
      description: IPv4 addresses of the edge server.
    ipv6Addrs:
      type: array
      items:
        $ref: 'TS29122_CommonData.yaml#/components/schemas/Ipv6Addr'
      minItems: 1
      description: IPv6 addresses of the edge server.
    uri:
      $ref: 'TS29122_CommonData.yaml#/components/schemas/Uri'
  oneOf:
    - required: [uri]
    - required: [fqdn]
    - required: [ipv4Addrs]
    - required: [ipv6Addrs]

PermissionLevel:
  anyOf:
    - type: string
      enum:
        - TRIAL
        - GOLD
        - SILVER
        - OTHER
    - type: string

```

```

description: >
  This string provides forward-compatibility with future
  extensions to the enumeration but is not used to encode
  content defined in the present version of this API.
description: |
  Indicates the level of service permissions supported by the EAS.
  Possible values are:
  - TRIAL: Level of service permission supported is TRIAL.
  - GOLD: Level of service permission supported is GOLD.
  - SILVER: Level of service permission supported is SILVER.
  - OTHER: Any other level of service permissions supported.

EASCategory:
  anyOf:
  - type: string
    enum:
      - UAS
      - V2X
      - APP_ENABLER
      - OTHER
  - type: string
    description: >
      This string provides forward-compatibility with future
      extensions to the enumeration but is not used to encode
      content defined in the present version of this API.
    description: |
      Indicates the category or type of the EAS.
      Possible values are:
      - UAS: Indicates that the EAS category is for UAS services.
      - V2X: Indicates that the EAS category is for V2X services.
      - APP_ENABLER: Indicates that the EAS category is for Application Enabler (e.g., SEAL)
        services.
      - OTHER: Indicates any other EAS category.

TransContSuppDetails:
  type: object
  description: >
    Represents the detailed information about the EAS (e.g. SEALDD Server) capability for
    seamless transport layer service continuity.
  properties:
    transProtocs:
      type: array
      items:
        $ref: '#/components/schemas/TransportProtocol'
      minItems: 1
      description: >
        Indicates the transport layer protocols supported for EAS context transfer using
        the seamless transport layer service continuity capability.
  required:
    - transProtocs

TransportProtocol:
  anyOf:
  - type: string
    enum:
      - QUIC
      - TCP
      - TCP_TLS
  - 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: |
      Indicates the transport layer protocol.
      Possible values are:
      - QUIC: Indicates the QUIC protocol.
      - TCP: Indicates the Transmission Control (TCP) Protocol.
      - TCP_TLS: Indicates the Transmission Control Protocol (TCP) with Transport Layer Security
        (TLS) protocol.

BdlType:
  anyOf:
  - type: string
    enum:
      - DIRECT
      - PROXY
  - 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 EAS Bundle type.
Possible values are:
- DIRECT: Indicates that the EAS Bundle type is direct bundle.
- PROXY: Indicates that the EAS Bundle type is proxy bundle.

Affinity:
anyOf:
- type: string
enum:
- STRONG
- PREFERRED
- WEAK
- 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 affinity requirements of an EAS bundle.
Possible values are:
- STRONG: Indicates that the affinity is strong, i.e., all the EASs of the bundle shall be in the same EDN.
- PREFERRED: Indicates that the affinity is preferred, i.e., it is preferred to have all the EASs of the bundle in the same EDN, but it is not essential.
- WEAK: Indicates that the affinity is weak, i.e., it is not essential to have all the EASs of the bundle in the same EDN.

FailureAction:
anyOf:
- type: string
enum:
- CANCEL
- PROCEED
- 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 EAS bundle related failure action during ACR.
Possible values are:
- CANCEL: Indicates that ACR shall be cancelled for the other EAS(s) of the bundle for which ACR is not failed.
- PROCEED: Indicates that ACR shall proceed for the other EAS(s) of the bundle for which ACR is not failed.

A.3 Eees_UELocation API

```
openapi: 3.0.0
info:
  title: EES UE Location Information_API
  description: |
    API for EES UE Location Information.
    © 2025, 3GPP Organizational Partners (ARIB, ATIS, CCSA, ETSI, TSDSI, TTA, TTC).
    All rights reserved.
  version: 1.1.1
externalDocs:
  description: >
    3GPP TS 29.558 V18.9.0 Enabling Edge Applications;
    Application Programming Interface (API) specification; Stage 3
  url: https://www.3gpp.org/ftp/Specs/archive/29_series/29.558/
security:
  - {}
  - oAuth2ClientCredentials: []
servers:
  - url: '{apiRoot}/eees-uelocation/v1'
    variables:
      apiRoot:
        default: https://example.com
        description: apiRoot as defined in clause 7.5 of 3GPP TS 29.558.
paths:
  /fetch:
    post:
```

```

summary: Fetch an UE location information.
operationId: FetchUELocation
tags:
  - Fetch an UE location information
requestBody:
  required: true
  content:
    application/json:
      schema:
        $ref: '#/components/schemas/LocationRequest'
responses:
  '200':
    description: OK (The requested location information)
    content:
      application/json:
        schema:
          $ref: '#/components/schemas/LocationResponse'
  '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:
  post:
    summary: Creates a new Individual Location Information Subscription resource
    operationId: CreateLocationInfoSubscription
    tags:
      - Location Information Subscriptions (Collection)
    description: >
      Create a Subscription resource for continuous reporting of UE location
      information to the EAS.
    requestBody:
      required: true
      content:
        application/json:
          schema:
            $ref: '#/components/schemas/LocationSubscription'
    responses:
      '201':
        description: >
          Created (The individual location information subscription resource
          is created successfully)
        content:
          application/json:
            schema:
              $ref: '#/components/schemas/LocationSubscription'
        headers:
          Location:
            description: 'Contains the URI of the newly created 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:
    $ref: 'TS29122_CommonData.yaml#/components/responses/default'
callbacks:
  LocationInformationNotification:
    '{$request.body#/notificationDestination}':
      post:
        requestBody: # contents of the callback message
          required: true
          content:
            application/json:
              schema:
                $ref: '#/components/schemas/LocationNotification'
        responses:
          '204':
            description: No Content (successful notification)
          '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:
            $ref: 'TS29122_CommonData.yaml#/components/responses/default'
  UserConsentRevocationNotif:
    '{$request.body#/revocationNotifUri}':
      post:
        requestBody:
          required: true
          content:
            application/json:
              schema:
                $ref: '#/components/schemas/ConsentRevocNotif'
        responses:
          '204':
            description: No Content (successful notification).
          '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: Read an Individual Location Information Subscription resource
    operationId: ReadIndLocationInfoSubscription
    tags:
      - Individual Location Information Subscription (Document)
    description: Retrieve an Individual location information subscription information.
    parameters:
      - name: subscriptionId
        in: path
        description: Subscription Id.
        required: true
        schema:
          type: string
    responses:
      '200':
        description: OK (Successfully get the location information subscription).
        content:
          application/json:
            schema:
              $ref: '#/components/schemas/LocationSubscription'
      '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: Update an Individual Location Information Subscription resource
    operationId: UpdateIndLocationInfoSubscription
    tags:
      - Individual Location Information Subscription (Document)
    description: Fully replace an existing Individual location information Subscription.
    parameters:
      - name: subscriptionId
        in: path
        description: Subscription Id.
        required: true
        schema:
          type: string
    requestBody:
      required: true
      content:
        application/json:
          schema:

```

```

    $ref: '#/components/schemas/LocationSubscription'
  responses:
    '200':
      description: OK (The individual location information subscription was modified
successfully).
      content:
        application/json:
          schema:
            $ref: '#/components/schemas/LocationSubscription'
    '204':
      description: No Content.
    '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: Modify an Individual Location Information Subscription resource
  operationId: ModifyIndLocationInfoSubscription
  tags:
    - Individual Location Information Subscription (Document)
  description: Partially update an existing Individual location information Subscription.
  parameters:
    - name: subscriptionId
      in: path
      description: Subscription Id.
      required: true
      schema:
        type: string
  requestBody:
    description: Partial update an existing Individual AC information Subscription.
    required: true
    content:
      application/merge-patch+json:
        schema:
          $ref: '#/components/schemas/LocationSubscriptionPatch'
  responses:
    '200':
      description: >
        OK (The Individual location information Subscription is successfully
        modified and the updated subscription information is returned in the response).
      content:
        application/json:
          schema:
            $ref: '#/components/schemas/LocationSubscription'
    '204':
      description: >
        No Content (The individual location information subscription was modified successfully).
    '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: Delete an Individual Location Information Subscription resource
  operationId: DeleteIndLocationInfoSubscription
  tags:
    - Individual Location Information Subscription (Document)
  description: Delete an existing Individual location information Subscription.
  parameters:
    - name: subscriptionId
      in: path
      description: Subscription Id.
      required: true
      schema:
        type: string
  responses:
    '204':
      description: The individual subscription is 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

components:
  securitySchemes:
    oAuth2ClientCredentials:
      type: oauth2
      flows:
        clientCredentials:
          tokenUrl: '{tokenUrl}'
          scopes: {}

  schemas:
    LocationSubscription:
      type: object
      description: Represents an Individual Location Information Subscription.
      properties:
        easId:
          type: string
          description: Identifier of the EAS subscribing for location information report.
        ueId:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/Gpsi'
        intGrpID:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/GroupId'
        extGrpID:

```

```

    $ref: 'TS29571_CommonData.yaml#/components/schemas/ExternalGroupId'
  expTime:
    $ref: 'TS29122_CommonData.yaml#/components/schemas/DateTime'
  locGran:
    $ref: 'TS29122_MonitoringEvent.yaml#/components/schemas/Accuracy'
  locQoS:
    $ref: 'TS29572_Nlmf_Location.yaml#/components/schemas/LocationQoS'
  eventReq:
    $ref: 'TS29523_Npcf_EventExposure.yaml#/components/schemas/ReportingInformation'
  notificationDestination:
    $ref: 'TS29122_CommonData.yaml#/components/schemas/Uri'
  requestTestNotification:
    type: boolean
    description: >
      Set to true by the EAS to request the EES to send a test notification.
      Set to false or omitted otherwise.
  revocationNotifUri:
    $ref: 'TS29122_CommonData.yaml#/components/schemas/Uri'
  websocketNotifConfig:
    $ref: 'TS29122_CommonData.yaml#/components/schemas/WebsocketNotifConfig'
  suppFeat:
    $ref: 'TS29571_CommonData.yaml#/components/schemas/SupportedFeatures'
  oneOf:
    - required: [ueId]
    - required: [intGrpId]
    - required: [extGrpId]
  required:
    - easId

LocationSubscriptionPatch:
  type: object
  description: Represents the partial update of Individual AC Information Subscription.
  properties:
    eventReq:
      $ref: 'TS29523_Npcf_EventExposure.yaml#/components/schemas/ReportingInformation'
    expTime:
      $ref: 'TS29122_CommonData.yaml#/components/schemas/DateTime'
    notificationDestination:
      $ref: 'TS29122_CommonData.yaml#/components/schemas/Uri'
    revocationNotifUri:
      $ref: 'TS29122_CommonData.yaml#/components/schemas/Uri'
    locGran:
      $ref: 'TS29122_MonitoringEvent.yaml#/components/schemas/Accuracy'
    locQoS:
      $ref: 'TS29572_Nlmf_Location.yaml#/components/schemas/LocationQoS'

LocationNotification:
  type: object
  description: Represents the filters information for AC Information Subscription.
  properties:
    subId:
      type: string
      description: >
        Identifier of the location information subscription for which the
        location information notification is related to.
    locEvs:
      type: array
      items:
        $ref: '#/components/schemas/LocationEvent'
      minItems: 1
      description: List of notifications with location information.
  required:
    - subId
    - locEvs

LocationEvent:
  type: object
  description: Location Information event notification.
  properties:
    ueId:
      $ref: 'TS29571_CommonData.yaml#/components/schemas/Gpsi'
    locInf:
      $ref: 'TS29122_MonitoringEvent.yaml#/components/schemas/LocationInfo'
    locInfPred:
      $ref: 'TS29522_AnalyticsExposure.yaml#/components/schemas/UeMobilityExposure'
  oneOf:
    - required: [locInf]
    - required: [locInfPred]

```

```

    required:
      - ueId

LocationRequest:
  type: object
  description: To request location information request.
  properties:
    ueId:
      $ref: 'TS29571_CommonData.yaml#/components/schemas/Gpsi'
    gran:
      $ref: 'TS29122_MonitoringEvent.yaml#/components/schemas/Accuracy'
    locQos:
      $ref: 'TS29572_Nlmf_Location.yaml#/components/schemas/LocationQoS'
    suppFeat:
      $ref: 'TS29571_CommonData.yaml#/components/schemas/SupportedFeatures'
  required:
    - ueId

LocationResponse:
  type: object
  description: Contains the response location information request.
  properties:
    ueLocation:
      $ref: 'TS29122_MonitoringEvent.yaml#/components/schemas/LocationInfo'
    suppFeat:
      $ref: 'TS29571_CommonData.yaml#/components/schemas/SupportedFeatures'
  required:
    - ueLocation

ConsentRevocNotif:
  description: >
    Represents the user consent revocation information conveyed in a user consent
    revocation notification.
  type: object
  properties:
    subscriptionId:
      type: string
      description: >
        Contains the identifier of the subscription to which the notification is related.
    consentsRevoked:
      type: array
      items:
        $ref: '#/components/schemas/ConsentRevoked'
      minItems: 1
  required:
    - subscriptionId
    - consentsRevoked

ConsentRevoked:
  description: Represents the information related to a revoked user consent.
  type: object
  properties:
    ucPurpose:
      $ref: 'TS29503_Nudm_SDM.yaml#/components/schemas/UcPurpose'
    externalId:
      $ref: 'TS29122_CommonData.yaml#/components/schemas/ExternalId'
    ueId:
      $ref: 'TS29571_CommonData.yaml#/components/schemas/Gpsi'
  required:
    - ucPurpose
  oneOf:
    - required: [externalId]
    - required: [ueId]

```

A.4 Ees_UeIdentifier API

openapi: 3.0.0

```

info:
  title: EES UE Identifier Service
  version: 1.1.0
  description: |
    EES UE Identifier Service.

```

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```
externalDocs:
  description: >
    3GPP TS 29.558 V18.6.0; Enabling Edge Applications;
    Application Programming Interface (API) specification; Stage 3.
  url: https://www.3gpp.org/ftp/Specs/archive/29_series/29.558/

security:
- {}
- oAuth2ClientCredentials: []

servers:
- url: '{apiRoot}/eees-ueidentifier/v1'
  variables:
    apiRoot:
      default: https://example.com
      description: apiRoot as defined in clause 5.2.4 of 3GPP TS 29.122

paths:
  /fetch:
    post:
      deprecated: true
      summary: Fetch the identifier of an UE.
      operationId: FetchUEId
      tags:
      - Fetch UE Identifier
      requestBody:
        required: true
        content:
          application/json:
            schema:
              $ref: '#/components/schemas/UserInformation'
      responses:
        '200':
          description: >
            The communicated ACR update information was successfully received.
            The response body contains the feedback of the EES.
          content:
            application/json:
              schema:
                $ref: 'TS29571_CommonData.yaml#/components/schemas/Gpsi'
        '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'

  /get:
    post:
      summary: Get the identifier of an UE.
      operationId: GetUEId
      tags:
      - Get UE Identifier
      requestBody:
```

```

    required: true
    content:
      application/json:
        schema:
          $ref: '#/components/schemas/UserInfo'
  responses:
    '200':
      description: >
        The operation is successful and the corresponding UE Identifier information, returned
        by the Edge Enabler Server is included in the response body.
      content:
        application/json:
          schema:
            $ref: '#/components/schemas/UEIdInfo'
    '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:
  UserInformation:
    deprecated: true
    description: >
      Represents information about the User or the UE, that used by EES to use 3GPP CN capability
      to retrieve the EAS specific UE identifier.
    type: object
    properties:
      easId:
        description: >
          The application identifier of the EAS, e.g. URI, FQDN, requesting the UE Identifier
          information
        type: string
      easProviderId:
        description: Identifier of the ASP that provides the EAS.
        type: string
      ipAddr:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/IpAddr'
      suppFeat:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/SupportedFeatures'
    required:
      - easId
      - ipAddr

UserInfo:
  description: >
    Represents information about the User or the UE, that used by EES to retrieve the UE
    Identifier information.

```

```

type: object
properties:
  easIds:
    type: array
    items:
      type: string
    minItems: 1
    description: >
      The additional list of EAS Identifier for which the UE IDs are requested for by EAS or
      EEC given the User information (e.g. IP address).
  easProviderId:
    description: Identifier of the ASP that provides the EAS.
    type: string
  ueId:
    $ref: 'TS29571_CommonData.yaml#/components/schemas/Gpsi'
  ipAddr:
    $ref: 'TS29571_CommonData.yaml#/components/schemas/IpAddr'
  appPortId:
    $ref: 'TS29122_CommonData.yaml#/components/schemas/Port'
  portNumber:
    $ref: 'TS29122_CommonData.yaml#/components/schemas/Port'
  suppFeat:
    $ref: 'TS29571_CommonData.yaml#/components/schemas/SupportedFeatures'
anyOf:
  - required: [ueId]
  - required: [ipAddr]

UeIdInfo:
description: >
  Represents UE Identifier Information, including list of UE Identifier related information.
type: object
properties:
  ueIds:
    type: array
    items:
      $ref: '#/components/schemas/UeId'
    minItems: 1
  required:
    - ueIds

UeId:
description: >
  Represents UE Identifier Information, including list of UE Identifier related information.
type: object
properties:
  edgeUeId:
    description: Represents EDGE UE Identifier.
    type: string
  afSpecUeId:
    $ref: 'TS29571_CommonData.yaml#/components/schemas/Gpsi'
  easId:
    description: >
      The application identifier of the EAS, e.g. URI, FQDN, requesting the UE Identifier
      Information.
    type: string
  oneOf:
    - required: [edgeUeId]
    - required: [afSpecUeId]

```

A.5 Ees_AppClientInformation API

```

openapi: 3.0.0
info:
  title: EES Application Client Information_API
  description: |
    API for EES Application Client Information.
    © 2024, 3GPP Organizational Partners (ARIB, ATIS, CCSA, ETSI, TSDSI, TTA, TTC).
    All rights reserved.
  version: 1.1.1
externalDocs:
  description: >
    3GPP TS 29.558 V18.8.0 Enabling Edge Applications;
    Application Programming Interface (API) specification; Stage 3
  url: https://www.3gpp.org/ftp/Specs/archive/29_series/29.558/
security:

```

```

- {}
- oAuth2ClientCredentials: []
servers:
- url: '{apiRoot}/eees-appclientinformation/v1'
  variables:
    apiRoot:
      default: https://example.com
      description: apiRoot as defined in clause 7.5 of 3GPP TS 29.558.

paths:
  /subscriptions:
    post:
      summary: Creates a new Individual Application Client Information Subscriptions resource
      operationId: CreateAppClientInfoSubscription
      tags:
        - Application Client Information Subscriptions (Collection)
      description: Create a Subscription resource for reporting of AC information to the EAS.
      requestBody:
        required: true
        content:
          application/json:
            schema:
              $ref: '#/components/schemas/ACInfoSubscription'
      responses:
        '201':
          description: >
            Created (The individual AC information subscription resource is created successfully)
          content:
            application/json:
              schema:
                $ref: '#/components/schemas/ACInfoSubscription'
          headers:
            Location:
              description: 'Contains the URI of the newly created 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:
          $ref: 'TS29122_CommonData.yaml#/components/responses/default'
      callbacks:
        ACInformationNotification:
          '{$request.body#/notificationDestination}':
            post:
              requestBody: # contents of the callback message
                required: true
                content:
                  application/json:
                    schema:
                      $ref: '#/components/schemas/ACInfoNotification'
            responses:
              '204':
                description: No Content (successful notification)
              '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: Read an Individual Application Client Information Subscriptions resource
    operationId: ReadIndAppClientInfoSubscription
    tags:
      - Individual Application Client Information Subscription (Document)
    description: Retrieve an Individual AC information subscription information.
    parameters:
      - name: subscriptionId
        in: path
        description: Subscription Id.
        required: true
        schema:
          type: string
    responses:
      '200':
        description: OK (Successfully get the AC information subscription).
        content:
          application/json:
            schema:
              $ref: '#/components/schemas/ACInfoSubscription'
      '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: Update an Individual Application Client Information Subscriptions resource
    operationId: UpdateIndAppClientInfoSubscription
    tags:
      - Individual Application Client Information Subscription (Document)
    description: Fully replace an existing Individual AC information Subscription.
    parameters:
      - name: subscriptionId
        in: path
        description: Subscription Id.
        required: true
        schema:
          type: string

```

```
requestBody:
  required: true
  content:
    application/json:
      schema:
        $ref: '#/components/schemas/ACInfoSubscription'
responses:
  '200':
    description: OK (The individual AC information subscription was modified successfully).
    content:
      application/json:
        schema:
          $ref: '#/components/schemas/ACInfoSubscription'
  '204':
    description: No Content.
  '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: Modify an Individual Application Client Information Subscriptions resource
  operationId: ModifyIndAppClientInfoSubscription
  tags:
    - Individual Application Client Information Subscription (Document)
  description: Partially update an existing Individual AC information Subscription.
  parameters:
    - name: subscriptionId
      in: path
      description: Subscription Id.
      required: true
      schema:
        type: string
  requestBody:
    description: Partial update an existing Individual AC information Subscription.
    required: true
    content:
      application/merge-patch+json:
        schema:
          $ref: '#/components/schemas/ACInfoSubscriptionPatch'
  responses:
    '200':
      description: >
        OK (The Individual AC information Subscription is successfully modified
        and the updated subscription information is returned in the response).
      content:
        application/json:
          schema:
            $ref: '#/components/schemas/ACInfoSubscription'
    '204':
      description: >
        No Content (The individual AC information subscription was modified successfully).
    '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: Delete an Individual Application Client Information Subscriptions resource
  operationId: DeleteIndAppClientInfoSubscription
  tags:
    - Individual Application Client Information Subscription (Document)
  description: Delete an existing Individual AC information Subscription.
  parameters:
    - name: subscriptionId
      in: path
      description: Subscription Id.
      required: true
      schema:
        type: string
  responses:
    '204':
      description: The individual subscription is 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

```

components:
  securitySchemes:
    oAuth2ClientCredentials:
      type: oauth2
      flows:
        clientCredentials:
          tokenUrl: '{tokenUrl}'
          scopes: {}

  schemas:
    ACInfoSubscription:
      type: object
      description: Represents an Individual AC Information Subscription.
      properties:
        easId:
          type: string
          description: Identifier of the EAS subscribing for AC information report.
        acFltrs:
          type: array
          items:

```

```

    $ref: '#/components/schemas/ACFilters'
    minItems: 1
    description: Filters to retrieve the information about specific ACs.
  expTime:
    $ref: 'TS29122_CommonData.yaml#/components/schemas/DateTime'
  eventReq:
    $ref: 'TS29523_Npcf_EventExposure.yaml#/components/schemas/ReportingInformation'
  notificationDestination:
    $ref: 'TS29122_CommonData.yaml#/components/schemas/Uri'
  requestTestNotification:
    type: boolean
    description: >
      Set to true by the EAS to request the EES to send a test notification.
      Set to false or omitted otherwise.
  websocketNotifConfig:
    $ref: 'TS29122_CommonData.yaml#/components/schemas/WebsocketNotifConfig'
  suppFeat:
    $ref: 'TS29571_CommonData.yaml#/components/schemas/SupportedFeatures'
  trigCondParams:
    type: array
    items:
      $ref: '#/components/schemas/TrigCondParams'
    minItems: 1
    description: >
      Represents the notification triggering conditions of the AC information subscription.
  required:
    - easId

ACInfoSubscriptionPatch:
  type: object
  description: Represents the partial update of Individual AC Information Subscription.
  properties:
    acFltrs:
      type: array
      items:
        $ref: '#/components/schemas/ACFilters'
      minItems: 1
      description: Filters to retrieve the information about specific ACs.
    expTime:
      $ref: 'TS29122_CommonData.yaml#/components/schemas/DateTime'
    eventReq:
      $ref: 'TS29523_Npcf_EventExposure.yaml#/components/schemas/ReportingInformation'
    notificationDestination:
      $ref: 'TS29122_CommonData.yaml#/components/schemas/Uri'
    trigCondParams:
      type: array
      items:
        $ref: '#/components/schemas/TrigCondParams'
      minItems: 1
      description: >
        Represents the notification triggering conditions of the AC information subscription.

ACFilters:
  type: object
  description: Represents the filters information for AC Information Subscription.
  properties:
    acTypesList:
      type: array
      items:
        type: string
      minItems: 1
    ecspIdsList:
      type: array
      items:
        type: string
      minItems: 1
    acIdsList:
      type: array
      items:
        type: string
      minItems: 1
    svcArea:
      $ref: 'TS29558_Eecs_EESRegistration.yaml#/components/schemas/ServiceArea'
    maxAcKpi:
      $ref: 'TS24558_Eees_EECRegistration.yaml#/components/schemas/ACServiceKPIs'
    minAcKpi:
      $ref: 'TS24558_Eees_EECRegistration.yaml#/components/schemas/ACServiceKPIs'
    opSchds:

```

```

    type: array
    items:
      $ref: 'TS29122_CpProvisioning.yaml#/components/schemas/ScheduledCommunicationTime'
    minItems: 1
    description: Operation schedule of EAS to be matched with operation schedule of the AC.
  ueIds:
    type: array
    items:
      $ref: 'TS29571_CommonData.yaml#/components/schemas/Gpsi'
    minItems: 1
    description: List of UE identifiers hosting the AC.
  locInfs:
    $ref: 'TS29122_CommonData.yaml#/components/schemas/LocationArea5G'
  easBndlInd:
    $ref: '#/components/schemas/EASBndlInd'

ACInfoNotification:
  type: object
  description: AC Information notification.
  properties:
    subId:
      type: string
      description: >
        Identifier of the AC information subscription for which this notification is related to.
    acInfs:
      type: array
      items:
        $ref: '#/components/schemas/ACInformation'
      minItems: 1
      description: Notifications that include the ACs information matching filter criteria.
  required:
    - subId
    - acInfs

ACInformation:
  type: object
  description: AC Information matching the filter criteria.
  properties:
    acProfs:
      type: array
      items:
        $ref: 'TS24558_Eees_EECRegistration.yaml#/components/schemas/ACProfile'
      minItems: 1
      description: List of profile information of ACs.
    ueIds:
      type: array
      items:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/Gpsi'
      minItems: 1
      description: List of UE identifiers hosting the AC.
    ueLocInfs:
      $ref: 'TS29122_CommonData.yaml#/components/schemas/LocationArea5G'
  required:
    - acProfs

EASBndlInd:
  type: object
  description: Represents the EAS bundle indication information.
  properties:
    bdlType:
      $ref: 'TS29558_Eees_EASRegistration.yaml#/components/schemas/BdlType'
    bdlId:
      type: string
      description: Indicates a bundle ID.
    easBdlReqs:
      $ref: 'TS29558_Eees_EASRegistration.yaml#/components/schemas/EASBdlReqs'
    parBundDet:
      type: boolean
      default: false
      description: >
        Set to true to indicate that the partial bundle determination is requested.
        Set to false to indicate that the partial bundle determination is not requested.
        Set to false or omitted otherwise.
  anyOf:
    - required: [bdlType]
    - required: [bdlId]
    - required: [easBdlReqs]
    - required: [parBundDet]

```

```

TrigCondParams:
  anyOf:
    - type: string
      enum:
        - ANALYTICS_INFO
        - EEC_REGISTRATION
        - EAS_DISCOVERY
        - UNSPECIFIED
    - type: string
      description: >
        This string provides forward-compatibility with future
        extensions to the enumeration but is not used to encode
        content defined in the present version of this API.
  description: |
    Represents the trigger condition parameter.
    Possible values are:
    - ANALYTICS_INFO: Indicates that the notification triggering condition is the analytics
      information.
    - EEC_REGISTRATION: Indicates that the notification triggering condition is the EEC
      registration.
    - EAS_DISCOVERY: Indicates that the notification triggering condition is the EAS
      discovery.
    - UNSPECIFIED: Indicates that the triggering conditions are unspecified.

```

A.6 Eees_SessionWithQoS API

```

openapi: 3.0.0
info:
  title: EES Session with QoS API
  description: |
    API for EES Session with QoS service.
    © 2026, 3GPP Organizational Partners (ARIB, ATIS, CCSA, ETSI, TSDSI, TTA, TTC).
    All rights reserved.
  version: 1.1.1
externalDocs:
  description: >
    3GPP TS 29.558 V18.11.0 Enabling Edge Applications;
    Application Programming Interface (API) specification; Stage 3
  url: https://www.3gpp.org/ftp/Specs/archive/29_series/29.558/
security:
  - {}
  - oAuth2ClientCredentials: []
servers:
  - url: '{apiRoot}/eees-session-with-qos/v1'
    variables:
      apiRoot:
        default: https://example.com
        description: apiRoot as defined in clause 7.5 of 3GPP TS 29.558.
paths:
  /sessions:
    post:
      summary: Create a new Individual Session with QoS resource
      operationId: CreateIndSessionWithQoS
      tags:
        - Sessions with QoS (Collection)
      description: >
        Request reservation of resources for a data session between AC and EAS with a specific QoS.
      requestBody:
        required: true
        content:
          application/json:
            schema:
              $ref: '#/components/schemas/SessionWithQoS'
      responses:
        '201':
          description: Created (Successful creation)
          content:
            application/json:
              schema:
                $ref: '#/components/schemas/SessionWithQoS'
          headers:
            Location:
              description: 'Contains the URI of the newly created 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:
    $ref: 'TS29122_CommonData.yaml#/components/responses/default'
callbacks:
  notificationDestination:
    '{$request.body#/notificationDestination}':
      post:
        requestBody: # contents of the callback message
          required: true
          content:
            application/json:
              schema:
                $ref: '#/components/schemas/UserPlaneEventNotification'
        responses:
          '204':
            description: No Content (successful notification)
          '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'

get:
  summary: Read all Sessions with QoS resource
  operationId: ReadAllSessionsWithQoS
  tags:
    - Sessions with QoS (Collection)
  description: Retrieve all the Session With QoS information.
  parameters:
    - name: eas-id
      in: query
      description: Identifier of the EAS which querying the status of subscriptions.
      required: true
      schema:
        type: string

```

```

responses:
  '200':
    description: OK (Successful get all of the active subscriptions)
    content:
      application/json:
        schema:
          type: array
          items:
            $ref: '#/components/schemas/SessionWithQoS'
          minItems: 1
          description: >
            All the subscription information related to the request URI is returned
  '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'

/sessions/{sessionId}:
  put:
    summary: Update an Individual Session with QoS resource
    operationId: UpdateIndSessionWithQoS
    tags:
      - Individual Session with QoS (Document)
    description: >
      Fully replace an existing Individual Session with QoS resource identified by a sessionId.
    parameters:
      - name: sessionId
        in: path
        description: Session Id.
        required: true
        schema:
          type: string
    requestBody:
      required: true
      content:
        application/json:
          schema:
            $ref: '#/components/schemas/SessionWithQoS'
    responses:
      '200':
        description: >
          The individual Session with QoS is successfully modified and the updated
          session with QoS context information is returned in the response.
        content:
          application/json:
            schema:
              $ref: '#/components/schemas/SessionWithQoS'
      '204':
        description: No Content
      '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: Modify an Individual Session with QoS resource
operationId: ModifyIndSessionWithQoS
tags:
  - Individual Session with QoS (Document)
parameters:
  - name: sessionId
    in: path
    description: session Id.
    required: true
    schema:
      type: string
requestBody:
  description: >
    Partial update an existing Individual Session with QoS resource identified by a sessionId.
  required: true
  content:
    application/merge-patch+json:
      schema:
        $ref: '#/components/schemas/SessionWithQoSpatch'
responses:
  '200':
    description: >
      The individual Session with QoS is successfully modified and the updated
      session with QoS context information is returned in the response.
    content:
      application/json:
        schema:
          $ref: '#/components/schemas/SessionWithQoS'
  '204':
    description: No Content.
  '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: Delete an Individual Session with QoS resource
operationId: DeleteIndSessionWithQoS
tags:

```

```

- Individual Session with QoS (Document)
description: Remove an Individual Session with QoS resource identified by a sessionId.
parameters:
- name: sessionId
  in: path
  description: session Id.
  required: true
  schema:
    type: string
responses:
'204':
  description: >
    The individual Session with QoS resource matching the sessionId 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'
get:
summary: Read Individual Session with QoS resource
operationId: ReadIndSessionWithQoS
tags:
- Individual Session with QoS (Document)
description: Read a subscription resource for a sessionId.
parameters:
- name: sessionId
  in: path
  description: Session Id.
  required: true
  schema:
    type: string
responses:
'200':
  description: The subscription information related to the request URI is returned.
  content:
    application/json:
      schema:
        $ref: '#/components/schemas/SessionWithQoS'
'307':
  $ref: 'TS29122_CommonData.yaml#/components/responses/307'
'308':
  $ref: 'TS29122_CommonData.yaml#/components/responses/308'
'400':
  $ref: 'TS29122_CommonData.yaml#/components/responses/400'
'401':
  $ref: 'TS29122_CommonData.yaml#/components/responses/401'
'403':
  $ref: 'TS29122_CommonData.yaml#/components/responses/403'
'404':
  $ref: 'TS29122_CommonData.yaml#/components/responses/404'
'406':
  $ref: 'TS29122_CommonData.yaml#/components/responses/406'
'429':
  $ref: 'TS29122_CommonData.yaml#/components/responses/429'
'500':
  $ref: 'TS29122_CommonData.yaml#/components/responses/500'
'503':
  $ref: 'TS29122_CommonData.yaml#/components/responses/503'
default:
  $ref: 'TS29122_CommonData.yaml#/components/responses/default'

```

Components

```

components:
  securitySchemes:
    oAuth2ClientCredentials:
      type: oauth2
      flows:
        clientCredentials:
          tokenUrl: '{tokenUrl}'
          scopes: {}

schemas:
  SessionWithQoS:
    type: object
    description: Represents an Individual Session with QoS Subscription.
    properties:
      self:
        $ref: 'TS29122_CommonData.yaml#/components/schemas/Uri'
      easId:
        type: string
        description: Identifier of an EAS.
      ueIpv4Addr:
        $ref: 'TS29122_CommonData.yaml#/components/schemas/Ipv4Addr'
      ueIpv6Addr:
        $ref: 'TS29122_CommonData.yaml#/components/schemas/Ipv6Addr'
      ipDomain:
        type: string
      ueId:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/Gpsi'
      intGrpID:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/GroupId'
      extGrpID:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/ExternalGroupId'
      ipFlows:
        type: array
        items:
          $ref: 'TS29514_Npcf_PolicyAuthorization.yaml#/components/schemas/FlowDescription'
        minItems: 1
        description: Contains the flow description for the Uplink and/or Downlink IP flows.
      trafFilterInfo:
        $ref: 'TS29558_Eees_ACRManagementEvent.yaml#/components/schemas/TrafficFilterInfo'
      qosReference:
        type: string
        description: Identifies a pre-defined QoS information.
      altQosReference:
        type: array
        items:
          type: string
        description: >
          Identifies an ordered list of pre-defined QoS information.
          The lower the index of the array for a given entry, the higher the priority.
      events:
        type: array
        items:
          $ref: 'TS29122_AsSessionWithQoS.yaml#/components/schemas/UserPlaneEvent'
        description: Indicates the events subscribed by the EAS.
      sponsorInformation:
        $ref: 'TS29122_CommonData.yaml#/components/schemas/SponsorInformation'
      qosMonInfo:
        $ref: 'TS29122_AsSessionWithQoS.yaml#/components/schemas/QosMonitoringInformation'
      notificationDestination:
        $ref: 'TS29122_CommonData.yaml#/components/schemas/Uri'
      dnn:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/Dnn'
      snssai:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/Snssai'
      maxbrUl:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/BitRate'
      maxbrDl:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/BitRate'
      disUeNotif:
        type: boolean
        description: >
          Indicates to disable QoS flow parameters signalling to the UE when the SMF is notified
          by the NG-RAN of changes in the fulfilled QoS situation when it is included and set to
          "true". The fulfilled situation is either the QoS profile or an Alternative QoS Profile.
          The default value "false" shall apply, if the attribute is not present and has not been
          supplied previously.
      requestTestNotification:

```

```

    type: boolean
    description: >
      Set to true by Subscriber to request the EES to send a test notification
      as defined in 3GPP TS 29.122. Set to false or omitted otherwise.
  webrtcNotifConfig:
    $ref: 'TS29122_CommonData.yaml#/components/schemas/WebsockNotifConfig'
  suppFeat:
    $ref: 'TS29571_CommonData.yaml#/components/schemas/SupportedFeatures'
  required:
  - easId
  - ipFlows

SessionWithQoSpatch:
  type: object
  description: Represents a modification request of Individual Session with QoS Subscription.
  properties:
    ipFlows:
      type: array
      items:
        $ref: 'TS29514_Npcf_PolicyAuthorization.yaml#/components/schemas/FlowDescription'
      minItems: 1
      description: Contains the flow description for the Uplink and/or Downlink IP flows.
    trafFilterInfo:
      $ref: 'TS29558_Eees_ACRManagementEvent.yaml#/components/schemas/TrafficFilterInfo'
    qosReference:
      type: string
      description: Identifies a pre-defined QoS information.
    altQosReference:
      type: array
      items:
        type: string
      description: >
        Identifies an ordered list of pre-defined QoS information.
        The lower the index of the array for a given entry, the higher the priority.
    events:
      type: array
      items:
        $ref: 'TS29122_AsSessionWithQoS.yaml#/components/schemas/UserPlaneEvent'
      description: Indicates the events subscribed by the EAS.
    sponsorInformation:
      $ref: 'TS29122_CommonData.yaml#/components/schemas/SponsorInformation'
    qosMonInfo:
      $ref: 'TS29122_AsSessionWithQoS.yaml#/components/schemas/QosMonitoringInformationRm'
    notificationDestination:
      $ref: 'TS29122_CommonData.yaml#/components/schemas/Uri'
    maxbrUl:
      $ref: 'TS29571_CommonData.yaml#/components/schemas/BitRateRm'
    maxbrDl:
      $ref: 'TS29571_CommonData.yaml#/components/schemas/BitRateRm'
    disUeNotif:
      type: boolean

UserPlaneEventNotification:
  type: object
  description: Represents the user plane event notification.
  properties:
    sessionId:
      type: string
      description: >
        String identifying the individual data session information for which
        the QoS event notification is delivered.
    eventReports:
      type: array
      items:
        $ref: 'TS29122_AsSessionWithQoS.yaml#/components/schemas/UserPlaneEventReport'
      minItems: 1
      description: >
        Contains the flow description for the Uplink and/or Downlink IP flows.
  required:
  - sessionId
  - eventReports

```

A.7 Eees_ACRManagementEvent API

openapi: 3.0.0

```

info:
  title: EES ACR Management Event_API
  description: |
    API for EES ACR Management Event.
    © 2024, 3GPP Organizational Partners (ARIB, ATIS, CCSA, ETSI, TSDSI, TTA, TTC).
    All rights reserved.
  version: 1.1.0

externalDocs:
  description: >
    3GPP TS 29.558 V18.6.0 Enabling Edge Applications;
    Application Programming Interface (API) specification; Stage 3
  url: https://www.3gpp.org/ftp/Specs/archive/29_series/29.558/

security:
- {}
- oAuth2ClientCredentials: []

servers:
- url: '{apiRoot}/eees-acrmgntevent/v1'
  variables:
    apiRoot:
      default: https://example.com
      description: apiRoot as defined in clause 7.5 of 3GPP TS 29.558.

paths:
  /subscriptions:
    post:
      summary: Creates a new Individual ACR Management Events Subscription
      operationId: CreateACRMngEventSubscr
      tags:
        - ACR Management Events Subscriptions (Collection)
      description: Create an Individual ACR Management Event Subscription resource.
      requestBody:
        required: true
        content:
          application/json:
            schema:
              $ref: '#/components/schemas/AcrMngtEventsSubscription'
      callbacks:
        ACRManagementEventsNotification:
          '{$request.body#/notificationDestination}':
            post:
              requestBody: # contents of the callback message
                required: true
                content:
                  application/json:
                    schema:
                      $ref: '#/components/schemas/AcrMngtEventsNotification'
      responses:
        '200':
          description: OK (The notification is received successfully)
          content:
            application/json:
              schema:
                $ref: '#/components/schemas/EasAckInformation'
        '204':
          description: No Content (successful notification)
        '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'
UPPathChangeAvailabilityNotif:
  '{ $request.body#/notificationDestination}/report-availability':
    post:
      requestBody:
        required: true
        content:
          application/json:
            schema:
              $ref: '#/components/schemas/AvailabilityNotif'
      responses:
        '204':
          description: No Content. The notification is successful 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'
responses:
  '201':
    description: Created (Successful creation)
    content:
      application/json:
        schema:
          $ref: '#/components/schemas/AcrMgntEventsSubscription'
    headers:
      Location:
        description: 'Contains the URI of the newly created resource'
        required: true
        schema:
          type: string
  '204':
    description: >
      Successful case. The resource has been successfully created and no
      additional content is to be sent in the response message.
  '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'

get:
  summary: Read all ACR Management Events Subscriptions
  operationId: GetACRMngEventSubscr
  tags:
    - ACR Management Events Subscriptions (Collection)
  description: Retrieve all the ACR Management Events Subscriptions information.
  parameters:
    - name: supp-feat
      in: query
      description: Features supported by the EAS.
      required: false
      schema:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/SupportedFeatures'
  responses:
    '200':
      description: OK (Successful get all of the active subscriptions)
      content:
        application/json:
          schema:
            type: array
            items:
              $ref: '#/components/schemas/AcrMgntEventsSubscription'
            minItems: 1
          description: All the active ACR management events subscriptions
    '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'

/subscriptions/{subscriptionId}:
  get:
    summary: Read an Individual ACR Management Events Subscription
    operationId: GetIndACRMngEventSubscr
    tags:
      - Individual ACR Management Events Subscription (Document)
    description: Retrieve an Individual ACR Management Events Subscription.
    parameters:
      - name: subscriptionId
        in: path
        description: Subscription Id.
        required: true
        schema:
          type: string
      - name: supp-feat
        in: query
        description: Features supported by the EAS.
        required: false
        schema:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/SupportedFeatures'
    responses:
      '200':
        description: OK (Successful get the active subscription).
        content:

```

```

    application/json:
      schema:
        $ref: '#/components/schemas/AcrMngtEventsSubscription'
  '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: Update an Individual ACR Management Events Subscription
  operationId: UpdateIndACRMngtEventSubscr
  tags:
    - Individual ACR Management Events Subscription (Document)
  description: Fully replace an existing Individual ACR Management Events Subscription.
  parameters:
    - name: subscriptionId
      in: path
      description: Subscription Id.
      required: true
      schema:
        type: string
  requestBody:
    required: true
    content:
      application/json:
        schema:
          $ref: '#/components/schemas/AcrMngtEventsSubscription'
  responses:
    '200':
      description: OK (Successful get the active subscription).
      content:
        application/json:
          schema:
            $ref: '#/components/schemas/AcrMngtEventsSubscription'
    '204':
      description: No Content
    '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: Modify an Individual ACR Management Events Subscription
  operationId: ModifyIndACRMngEventSubscr
  tags:
    - Individual ACR Management Events Subscription (Document)
  parameters:
    - name: subscriptionId
      in: path
      description: Subscription Id.
      required: true
      schema:
        type: string
  requestBody:
    description: Partial update an existing Individual ACR Management Events Subscription.
    required: true
    content:
      application/merge-patch+json:
        schema:
          $ref: '#/components/schemas/AcrMngtEventsSubscriptionPatch'
  responses:
    '200':
      description: >
        The Individual ACR Management Events Subscription is successfully modified
        and the updated subscription information is returned in the response.
      content:
        application/json:
          schema:
            $ref: '#/components/schemas/AcrMngtEventsSubscription'
    '204':
      description: No Content.
    '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: Delete an Individual ACR Management Events Subscription
  operationId: DeleteIndACRMngEventSubscr
  tags:
    - Individual ACR Management Events Subscription (Document)
  description: Delete an existing Individual ACR Management Events Subscription.
  parameters:
    - name: subscriptionId
      in: path
      description: Subscription Id.
      required: true
      schema:
        type: string
  responses:
    '204':
      description: The individual subscription is 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

```

components:
  securitySchemes:
    oAuth2ClientCredentials:
      type: oauth2
      flows:
        clientCredentials:
          tokenUrl: '{tokenUrl}'
          scopes: {}

schemas:

  AcrMgmtEventsSubscription:
    type: object
    description: Represents an Individual ACR Management Events Subscription.
    properties:
      self:
        $ref: 'TS29122_CommonData.yaml#/components/schemas/Uri'
      easId:
        type: string
        description: Identifier of an EAS.
      eventSubscs:
        type: array
        items:
          $ref: '#/components/schemas/AcrMgmtEventSubsc'
        minItems: 1
        description: The subscribed ACR management events.
      evtReq:
        $ref: 'TS29523_Npcf_EventExposure.yaml#/components/schemas/ReportingInformation'
      notificationDestination:
        $ref: 'TS29122_CommonData.yaml#/components/schemas/Uri'
      eventReports:
        type: array
        items:
          $ref: '#/components/schemas/AcrMgmtEventReport'
        minItems: 1
        description: The ACR management event report(s).
      availabilityInfo:
        $ref: '#/components/schemas/AvailabilityNotif'
      failEventReports:
        type: array
        items:
          $ref: '#/components/schemas/FailureAcrMgmtEventInfo'
        minItems: 1
        description: Failure event reports.
      requestTestNotification:
        type: boolean
        description: >
          Set to true by the EAS to request the EES to send a test notification.
          Set to false or omitted otherwise.
      websocketNotifConfig:
        $ref: 'TS29122_CommonData.yaml#/components/schemas/WebsocketNotifConfig'
      suppFeat:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/SupportedFeatures'
    required:
      - easId
      - eventSubscs
      - notificationDestination

```

```

AcrMgntEventSubsc:
  type: object
  description: Represents an ACR Management Event Subscription.
  properties:
    event:
      $ref: '#/components/schemas/AcrMgntEvent'
    eventFilter:
      $ref: '#/components/schemas/AcrMgntEventFilter'
    evtReq:
      $ref: 'TS29523_Npcf_EventExposure.yaml#/components/schemas/ReportingInformation'
    tgtUeId:
      $ref: '#/components/schemas/TargetUeIdentification'
    dnaiChgType:
      $ref: 'TS29571_CommonData.yaml#/components/schemas/DnaiChangeType'
    easAckInd:
      type: boolean
      description: >
        Identifies whether EAS acknowledgement of UP path change event notifications is to be
        expected. Set to "true" if the EAS acknowledgement is expected. Set to "false" if
        the EAS acknowledgement is not expected. Default value is "false" if omitted.
        This attribute may be provided only if the "event" attribute is set to "UP_PATH_CHG".
    easChars:
      type: array
      items:
        $ref: 'TS24558_Eees_EASDiscovery.yaml#/components/schemas/EasCharacteristics'
      minItems: 1
      description: A list of EAS characteristics.
    traffFilterInfo:
      $ref: '#/components/schemas/TrafficFilterInfo'
    servContPlanInd:
      type: boolean
      description: >
        Represents the service continuity planning indication (i.e., whether or not the EES
        shall monitor whether the UE(s) enter the predicted location).
        When set to true, it indicates that service continuity planning is required.
        When set to false, it indicates that Service continuity planning is not required.
        The default value when this attribute is omitted is false.
    easAckSvcCont:
      type: boolean
      description: >
        Indicates that the EAS will provide an acknowledgement as a response to the notification
        of ACR management notification related to service continuity planning. Set to "true" if
        the EAS acknowledgement is expected. Default value is "false". This attribute may be
        provided only if the "event" attribute is set to "ACR_MONITORING" and/or
        "ACR_FACILITATION".
  required:
    - event

AcrMgntEventsSubscriptionPatch:
  type: object
  description: >
    Represents a modification request of Individual ACR Management Events Subscription.
  properties:
    eventSubscs:
      type: array
      items:
        $ref: '#/components/schemas/AcrMgntEventSubsc'
      minItems: 1
      description: The subscribed ACR management events.
    evtReq:
      $ref: 'TS29523_Npcf_EventExposure.yaml#/components/schemas/ReportingInformation'
    notificationDestination:
      $ref: 'TS29122_CommonData.yaml#/components/schemas/Uri'

AcrMgntEventsNotification:
  type: object
  description: Represents the ACR management events notification.
  properties:
    subpId:
      type: string
      description: >
        String identifying the Individual ACR Management Events Subscription
        for which the notification is delivered.
    eventReports:
      type: array
      items:
        $ref: '#/components/schemas/AcrMgntEventReport'

```

```

    minItems: 1
    description: A list of ACR management event reports.
  required:
  - subpId
  - eventReports

AcrMgntEventReport:
  type: object
  description: Represents an ACR management event report.
  properties:
    event:
      $ref: '#/components/schemas/AcrMgntEvent'
    timeStamp:
      $ref: 'TS29571_CommonData.yaml#/components/schemas/DateTime'
    upPathChgInfo:
      $ref: '#/components/schemas/UpPathChangeInfo'
    easEndPoint:
      $ref: 'TS29558_Eees_EASRegistration.yaml#/components/schemas/EndPoint'
    actStatus:
      $ref: '#/components/schemas/ActStatus'
    acrParams:
      $ref: '#/components/schemas/ACRParameters'
    acId:
      type: string
    ueId:
      $ref: '#/components/schemas/TargetUeIdentification'
    selACRScen:
      type: array
      items:
        $ref: '#/components/schemas/SelectedACRScenarios'
    minItems: 1
    easInBdlInfoList:
      type: array
      items:
        $ref: '#/components/schemas/EasInBundleInfo'
    minItems: 1
    description: Represents the list of EAS in a bundle related information.
    servContPlanInd:
      type: boolean
      description: >
        Represents the service continuity planning indication (i.e., whether or not the EES will
        monitor whether the UE(s) enter the predicted location).
        When set to true, it indicates that service continuity planning will be performed.
        When set to false, it indicates that Service continuity planning will not be performed.
        The default value when this attribute is omitted is false.
  required:
  - event

ACRParameters:
  type: object
  description: Represents the ACR parameters.
  properties:
    predictExpTime:
      $ref: 'TS29122_CommonData.yaml#/components/schemas/DateTime'

FailureAcrMgntEventInfo:
  type: object
  description: Represents a failure ACR management event.
  properties:
    event:
      $ref: '#/components/schemas/AcrMgntEvent'
    failureCode:
      $ref: '#/components/schemas/AcrMgntEventFailureCode'
  required:
  - event
  - failureCode

TargetUeIdentification:
  description: Identifies the target UE information.
  type: object
  properties:
    gpsi:
      $ref: 'TS29571_CommonData.yaml#/components/schemas/Gpsi'
    edgeUeId:
      type: string
    intGrpID:
      $ref: 'TS29571_CommonData.yaml#/components/schemas/GroupId'
    extGrpID:

```

```

    $ref: 'TS29571_CommonData.yaml#/components/schemas/ExternalGroupId'
  ueIpAddr:
    $ref: 'TS29571_CommonData.yaml#/components/schemas/IpAddr'
  oneOf:
    - required: [gpsi]
    - required: [edgeUeId]
    - required: [intGrpId]
    - required: [extGrpId]
    - required: [ueIpAddr]

AvailabilityNotif:
  type: object
  description: >
    Represents the availability information of user plane path management events monitoring
    via the 3GPP 5GC network.
  properties:
    availabilityStatus:
      $ref: '#/components/schemas/AvailabilityStatus'
  required:
    - availabilityStatus

UpPathChangeInfo:
  description: Represents user plane path change information.
  type: object
  properties:
    ueId:
      $ref: '#/components/schemas/IndUeIdentification'
    dnaiChgType:
      $ref: 'TS29571_CommonData.yaml#/components/schemas/DnaiChangeType'
    sourceTrafficRoute:
      $ref: 'TS29571_CommonData.yaml#/components/schemas/RouteToLocation'
    targetTrafficRoute:
      $ref: 'TS29571_CommonData.yaml#/components/schemas/RouteToLocation'
    sourceDnai:
      $ref: 'TS29571_CommonData.yaml#/components/schemas/Dnai'
    targetDnai:
      $ref: 'TS29571_CommonData.yaml#/components/schemas/Dnai'
    srcUeIpv4Addr:
      $ref: 'TS29122_CommonData.yaml#/components/schemas/Ipv4Addr'
    srcUeIpv6Prefix:
      $ref: 'TS29571_CommonData.yaml#/components/schemas/Ipv6Prefix'
    tgtUeIpv4Addr:
      $ref: 'TS29122_CommonData.yaml#/components/schemas/Ipv4Addr'
    tgtUeIpv6Prefix:
      $ref: 'TS29571_CommonData.yaml#/components/schemas/Ipv6Prefix'
  required:
    - ueId
    - dnaiChgType

IndUeIdentification:
  description: Represents identification information of a UE.
  type: object
  properties:
    gpsi:
      $ref: 'TS29571_CommonData.yaml#/components/schemas/Gpsi'
    externalId:
      $ref: 'TS29122_CommonData.yaml#/components/schemas/ExternalId'
    ueIpAddr:
      $ref: 'TS29571_CommonData.yaml#/components/schemas/IpAddr'
  oneOf:
    - required: [gpsi]
    - required: [externalId]
    - required: [ueIpAddr]

TrafficFilterInfo:
  description: Represents the Traffic Filter Information.
  type: object
  properties:
    ipFlows:
      type: array
      items:
        $ref: 'TS29514_Npcf_PolicyAuthorization.yaml#/components/schemas/FlowDescription'
      minItems: 1
      description: Contains the flow description for the Uplink and/or Downlink IP flows.
    uris:
      type: array
      items:
        type: string

```

```

    minItems: 1
    description: Indicates URI(s) matching criteria.
  domainNames:
    type: array
    items:
      type: string
    minItems: 1
    description: Indicates Domain Name matching criteria.
  dnProtocol:
    $ref: 'TS29122_PfdManagement.yaml#/components/schemas/DomainNameProtocol'
  anyOf:
    - required: [ipFlows]
    - required: [uris]
    - required: [domainNames]

SelectedACRScenarios:
  type: object
  description: >
    Represents the selected ACR scenario(s) applicable for a given combination of AC and UE.
  properties:
    acrList:
      type: array
      items:
        $ref: 'TS29558_Eecs_EESRegistration.yaml#/components/schemas/ACRScenario'
      minItems: 0
    acId:
      type: string
    ueId:
      $ref: 'TS29571_CommonData.yaml#/components/schemas/Gpsi'
  required:
    - acrList
    - acId
    - ueId

EasAckInformation:
  type: object
  description: Represents the EAS acknowledgement information.
  properties:
    resCode:
      $ref: '#/components/schemas/ResultCode'
  required:
    - resCode

EasInBundleInfo:
  type: object
  description: >
    Represents EAS in a bundle information.
  properties:
    easId:
      type: string
      description: Contains the identifier of the EAS that is within an EAS bundle.
    dnais:
      type: array
      items:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/Dnai'
      minItems: 1
    svcArea:
      $ref: 'TS29558_Eecs_EESRegistration.yaml#/components/schemas/ServiceArea'
  required:
    - easId

#
# ENUMERATIONS DATA TYPES
#

AcrMgmtEvent:
  anyOf:
    - type: string
      enum:
        - UP_PATH_CHG
        - ACR_MONITORING
        - ACR_FACILITATION
        - ACT_START_STOP
        - ACR_SELECTION
    - 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 ACR Management event.
  Possible values are:
  - UP_PATH_CHG: Indicates that ACR Management Event is the User plane path change event.
  - ACR_MONITORING: Indicates that ACR Management Event is the ACR monitoring event.
  - ACR_FACILITATION: Indicates that ACR Management Event is the ACR facilitation event.
  - ACT_START_STOP: Indicates that ACR Management Event is the ACT start/stop event.
  - ACR_SELECTION: Indicates that ACR Management Event is the ACR selection event.

AcrMgmtEventFilter:
  anyOf:
  - type: string
    enum:
      - INTRA_EDN_MOBILITY
      - INTER_EDN_MOBILITY
  - 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 filtering criteria for the ACR Management event.
    Possible values are:
    - INTRA_EDN_MOBILITY: Indicates that the ACR Management Event filter is intra-EDN mobility.
    - INTER_EDN_MOBILITY: Indicates that the ACR Management Event filter is inter-EDN mobility.

ActStatus:
  anyOf:
  - type: string
    enum:
      - ACT_START
      - ACT_STOP
  - 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 ACT status.
    Possible values are:
    - ACT_START: Indicates ACT start.
    - ACT_STOP: Indicates ACT stop.

AcrMgmtEventFailureCode:
  anyOf:
  - type: string
    enum:
      - 3GPP_UP_PATH_CHANGE_MON_NOT_AVAILABLE
      - 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 failure reason for the ACR Management event.
    Possible values are:
    - 3GPP_UP_PATH_CHANGE_MON_NOT_AVAILABLE: Indicates that the ACR Management Event
      Subscription failed because user plane path management event notifications from the 3GPP
      network is NOT available. This value is only applicable for the "UP_PATH_CHG",
      "ACR_MONITORING" and "ACR_FACILITATION" events.
    - OTHER_REASONS: Indicates that the ACR Management Event Subscription failed for other
      reasons. This value is applicable for all events.

AvailabilityStatus:
  anyOf:
  - type: string
    enum:
      - AVAILABLE
      - NOT_AVAILABLE
  - 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 availability status.
    Possible values are:
    - AVAILABLE: Indicates availability.
    - NOT_AVAILABLE: Indicates unavailability.

ResultCode:
```

```

anyOf:
- type: string
  enum:
    - ACCEPTED
    - REJECTED
- 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 result code of ACT acceptance by EAS.
  Possible values are:
  - ACCEPTED: Indicates acceptance of the ACT.
  - REJECTED: Indicates rejection of the ACT.

```

A.8 Eees_EECContextRelocation API

openapi: 3.0.0

info:

```

title: EES EEC Context Relocation API
version: 1.1.0
description: |
  API for EEC Context Relocation.
  © 2024, 3GPP Organizational Partners (ARIB, ATIS, CCSA, ETSI, TSDSI, TTA, TTC).
  All rights reserved.

```

externalDocs:

```

description: >
  3GPP TS 29.558 V18.6.0 Enabling Edge Applications;
  Application Programming Interface (API) specification; Stage 3
url: https://www.3gpp.org/ftp/Specs/archive/29_series/29.558/

```

security:

```

- {}
- oAuth2ClientCredentials: []

```

servers:

```

- url: '{apiRoot}/eees-eecontextreloc/v1'
  variables:
    apiRoot:
      default: https://example.com
      description: apiRoot as defined in clause 7.5 of 3GPP TS 29.558.

```

paths:

```

/eec-contexts:
  post:
    summary: Push EEC Context information.
    operationId: PushEecContexts
    tags:
      - EEC contexts (Collection)
    requestBody:
      required: true
      content:
        application/json:
          schema:
            $ref: '#/components/schemas/EECContextPush'
    responses:
      '200':
        description: >
          OK. The EEC context has been successfully pushed to the EES and related
          information is returned in the response body.
        content:
          application/json:
            schema:
              $ref: '#/components/schemas/EECContextPushRes'
      '204':
        description: No Content. The EEC context has been successfully pushed to the EES.
      '400':
        $ref: '#/components/responses/400'
      '401':
        $ref: '#/components/responses/401'
      '403':
        $ref: '#/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'

```

get:

```

summary: Pull EEC Context information.
operationId: PullEecContexts
tags:
- EEC contexts (Collection)
parameters:
- name: ees-id
  in: query
  description: Unique identifier of the requesting entity.
  required: true
  schema:
    type: string
- name: eec-cntx-id
  in: query
  description: Unique identifier of the EEC context.
  required: true
  schema:
    type: string
- name: sess-cntxs
  in: query
  description: List of service session context information being requested.
  required: false
  schema:
    $ref: '#/components/schemas/SessionContexts'
responses:
'200':
  description: >
    OK. The EEC context information matching the query parameters in the request
    shall be returned.
  content:
    application/json:
      schema:
        $ref: '#/components/schemas/EECContext'
'400':
  $ref: 'TS29122_CommonData.yaml#/components/responses/400'
'401':
  $ref: 'TS29122_CommonData.yaml#/components/responses/401'
'403':
  $ref: 'TS29122_CommonData.yaml#/components/responses/403'
'404':
  $ref: 'TS29122_CommonData.yaml#/components/responses/404'
'406':
  $ref: 'TS29122_CommonData.yaml#/components/responses/406'
'429':
  $ref: 'TS29122_CommonData.yaml#/components/responses/429'
'500':
  $ref: 'TS29122_CommonData.yaml#/components/responses/500'
'503':
  $ref: 'TS29122_CommonData.yaml#/components/responses/503'
default:
  $ref: 'TS29122_CommonData.yaml#/components/responses/default'

```

components:

```

securitySchemes:
  oAuth2ClientCredentials:
    type: oauth2
    flows:
      clientCredentials:
        tokenUrl: '{tokenUrl}'
        scopes: {}

```

```
schemas:
  SessionContexts:
    type: object
    description: Represents the list of service session contexts information.
    properties:
      sessCntxs:
        type: array
        items:
          $ref: '#/components/schemas/IndividualSessionContext'
        minItems: 1
        description: List of service session contexts information.
    required:
      - sessCntxs

  IndividualSessionContext:
    type: object
    description: Represents a single service session context information.
    properties:
      easId:
        type: string
        description: Identifier of the Application Server providing the application services.
      endPt:
        $ref: 'TS29558_Eees_EASRegistration.yaml#/components/schemas/EndPoint'
      acId:
        type: string
        description: Identifier of the AC for which the service session information is provided.
      acrList:
        type: array
        items:
          $ref: 'TS29558_Eecs_EESRegistration.yaml#/components/schemas/ACRScenario'
        minItems: 1
        description: The list of selected ACR scenarios.
      eecId:
        type: string
    required:
      - easId
      - endPt

  EEContextPush:
    type: object
    description: Represents the EEC context push request data.
    properties:
      eesId:
        type: string
        description: Identifier of the entity that is pushing the EEC context information.
      eecCntx:
        $ref: '#/components/schemas/EEContext'
      tgtEas:
        $ref: 'TS29558_Eees_EASRegistration.yaml#/components/schemas/EndPoint'
      acrScenariosSelReq:
        type: boolean
        description: >
          Set to true if the EEC indicates to select the ACR scenarios.
          Set to false if it is not required to select the ACR scenarios.
          The default value when omitted is false.
    required:
      - eesId
      - eecCntx

  EEContextPushRes:
    type: object
    description: Represents the EEC context push response data.
    properties:
      implReg:
        $ref: '#/components/schemas/ImplicitRegDetails'
      selAcrScenariosList:
        type: array
        items:
          $ref: 'TS29558_Eecs_EESRegistration.yaml#/components/schemas/ACRScenario'
        minItems: 1

  ImplicitRegDetails:
    type: object
    description: Represents the EEC implicit registration details.
    properties:
      regId:
        type: string
```

```

    description: Identifier of the EEC registration.
    expTime:
      $ref: 'TS29122_CommonData.yaml#/components/schemas/DateTime'
    required:
      - regId

EEContext:
  type: object
  description: Represents the EEC context information.
  properties:
    eecId:
      type: string
      description: Unique identifier of the EEC.
    cntxId:
      type: string
      description: Unique identifier assigned to the EEC context.
    ueId:
      $ref: 'TS29571_CommonData.yaml#/components/schemas/Gpsi'
    elSubs:
      type: array
      items:
        type: string
      minItems: 1
      description: List of subscription IDs for the capability exposure for the EEC ID.
    ueLoc:
      $ref: 'TS29122_CommonData.yaml#/components/schemas/LocationArea5G'
    acProfs:
      type: array
      items:
        $ref: 'TS24558_Eees_EECRegistration.yaml#/components/schemas/ACProfile'
      minItems: 1
      description: List AC profiles.
    sessCntxs:
      $ref: '#/components/schemas/SessionContexts'
    eecSrvContSupp:
      $ref: '#/components/schemas/EECSrvContinuitySupport'
    ueMobSuppInd:
      type: boolean
      description: >
        Set to true to indicate that UE Mobility support is required.
        Set to false to indicate that UE mobility support is not required.
        The default value when omitted is false.
    required:
      - eecId
      - cntxId

EECSrvContinuitySupport:
  type: object
  description: Represents the EEC service continuity support details.
  properties:
    srvContSupp:
      type: boolean
      description: >
        Set to true if EEC supports service continuity.
        Set to false if EEC does not supports service continuity.
        The default value when omitted is false.
    acrScenarios:
      type: array
      items:
        $ref: 'TS29558_Eecs_EESRegistration.yaml#/components/schemas/ACRScenario'
      minItems: 1
      description: The list of ACR scenarios supported by EEC.
    required:
      - srvContSupp

```

A.9 Eees_EELManagedACR API

```

openapi: 3.0.0
info:
  title: EES EEL Managed ACR Service
  version: 1.1.0
  description: |
    EES EEL Managed ACR Service.
    © 2024, 3GPP Organizational Partners (ARIB, ATIS, CCSA, ETSI, TSDSI, TTA, TTC).

```

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```

externalDocs:
  description: >
    3GPP TS 29.558 V18.6.0; Enabling Edge Applications;
    Application Programming Interface (API) specification; Stage 3.
  url: https://www.3gpp.org/ftp/Specs/archive/29_series/29.558/
security:
- {}
- oAuth2ClientCredentials: []
servers:
- url: '{apiRoot}/eees-eel-acr/v1'
  variables:
    apiRoot:
      default: https://example.com
      description: apiRoot as defined in clause 5.2.4 of 3GPP TS 29.122

paths:
  /request-eelacr:
    post:
      summary: Request the EES (e.g. S-EES) to handle all the operations of an ACR.
      operationId: RequestEELManagedACR
      tags:
      - Request EEL Managed ACR
      requestBody:
        required: true
        content:
          application/json:
            schema:
              $ref: '#/components/schemas/EELACRReq'
      responses:
        '200':
          description: >
            The requested EEL Managed ACR initiation was successfully received and
            processed. The response body contains the feedback of the EES.
          content:
            application/json:
              schema:
                $ref: '#/components/schemas/EELACRResp'
        '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:
    get:
      summary: Retrieve all the active ACT Status Subscriptions managed by the EES.
      operationId: GetACTStatusSubscriptions
      tags:
      - ACT Status Subscriptions (Collection)
      responses:
        '200':
          description: >
            OK. All the active ACT status subscriptions managed by the EES shall
            be returned.
          content:

```

```

    application/json:
      schema:
        type: array
        items:
          $ref: '#/components/schemas/ACTStatusSubsc'
'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 ACT status reporting.
  operationId: CreateACTStatusSubsc
  tags:
    - ACT Status Subscriptions (Collection)
  requestBody:
    required: true
    content:
      application/json:
        schema:
          $ref: '#/components/schemas/ACTStatusSubsc'
  responses:
    '201':
      description: >
        Created. The subscription is successfully created and a representation of the
        created Individual ACT Status Subscription resource shall be returned.
      content:
        application/json:
          schema:
            $ref: '#/components/schemas/ACTStatusSubsc'
      headers:
        Location:
          description: >
            Contains the URI of the created Individual ACT 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:

```

```

ACTStatusNotification:
  '{$request.body#/notificationUri}/act-status':
    post:
      requestBody:
        required: true
        content:
          application/json:
            schema:
              $ref: '#/components/schemas/ACTStatusNotif'
      responses:
        '204':
          description: >
            No Content. The ACT 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 an ACT status subscription resource.
    operationId: GetACTStatusSubscription
    tags:
      - Individual ACT Status Subscription (Document)
    parameters:
      - name: subscriptionId
        in: path
        description: Individual ACT Status Subscription identifier.
        required: true
        schema:
          type: string
    responses:
      '200':
        description: >
          OK. The requested real-time UAV status subscription resource is returned.
        content:
          application/json:
            schema:
              $ref: '#/components/schemas/ACTStatusSubsc'
      '307':
        $ref: 'TS29122_CommonData.yaml#/components/responses/307'
      '308':
        $ref: 'TS29122_CommonData.yaml#/components/responses/308'
      '400':
        $ref: 'TS29122_CommonData.yaml#/components/responses/400'
      '401':
        $ref: 'TS29122_CommonData.yaml#/components/responses/401'
      '403':
        $ref: 'TS29122_CommonData.yaml#/components/responses/403'
      '404':
        $ref: 'TS29122_CommonData.yaml#/components/responses/404'
      '406':
        $ref: 'TS29122_CommonData.yaml#/components/responses/406'
      '429':
        $ref: 'TS29122_CommonData.yaml#/components/responses/429'

```

```

    '500':
      $ref: 'TS29122_CommonData.yaml#/components/responses/500'
    '503':
      $ref: 'TS29122_CommonData.yaml#/components/responses/503'
  default:
    $ref: 'TS29122_CommonData.yaml#/components/responses/default'

components:
  securitySchemes:
    oAuth2ClientCredentials:
      type: oauth2
      flows:
        clientCredentials:
          tokenUrl: '{tokenUrl}'
          scopes: {}

schemas:
  EELACRReq:
    description: >
      Represents the parameters to request the EES (e.g. S-EES) to handle all the
      operations of an ACR.
    type: object
    properties:
      ueId:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/Gpsi'
      easCharacs:
        type: array
        items:
          $ref: 'TS24558_Eees_EASDiscovery.yaml#/components/schemas/EasCharacteristics'
        minItems: 1
      appCtxtStoreAddr:
        $ref: 'TS29122_CommonData.yaml#/components/schemas/Uri'
      suppFeat:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/SupportedFeatures'
    required:
      - ueId
      - easCharacs

  EELACRResp:
    description: Represents the feedback of the EES on EEL Managed ACR request.
    type: object
    properties:
      appCtxtStoreAddr:
        $ref: 'TS29122_CommonData.yaml#/components/schemas/Uri'
      suppFeat:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/SupportedFeatures'

  ACTStatusSubsc:
    description: >
      Represents the parameters to request the creation of a subscription to ACT
      status reporting.
    type: object
    properties:
      easId:
        type: string
        description: Contains the application identifier of the EAS, e.g. URI, FQDN.
      notificationUri:
        $ref: 'TS29122_CommonData.yaml#/components/schemas/Uri'
      suppFeat:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/SupportedFeatures'
    required:
      - easId
      - notificationUri

  ACTStatusNotif:
    description: Represents an ACT status notification.
    type: object
    properties:
      subscriptionId:
        type: string
        description: Subscription identifier.
      actStatus:
        $ref: 'TS29558_Eees_ACRStatusUpdate.yaml#/components/schemas/ACTResult'
    required:
      - subscriptionId
      - actStatus

```

```
# ENUMS:
```

A.10 Eees_ACRStatusUpdate API

openapi: 3.0.0

info:

```
title: EES ACR Status Update Service
version: 1.1.0
description: |
  EES ACR Status Update Service.
  © 2024, 3GPP Organizational Partners (ARIB, ATIS, CCSA, ETSI, TSDSI, TTA, TTC).
  All rights reserved.
```

externalDocs:

```
description: >
  3GPP TS 29.558 V18.6.0; Enabling Edge Applications;
  Application Programming Interface (API) specification; Stage 3.
url: https://www.3gpp.org/ftp/Specs/archive/29_series/29.558/
```

security:

```
- {}
- oAuth2ClientCredentials: []
```

servers:

```
- url: '{apiRoot}/eees-acrstatus-update/v1'
  variables:
    apiRoot:
      default: https://example.com
      description: apiRoot as defined in clause 5.2.4 of 3GPP TS 29.122
```

paths:

```
/request-acrupdate:
  post:
    summary: Request to update the information related to ACR (e.g. indicate the status of ACT,
    update the notification target address).
    operationId: RequestACRUpdate
    tags:
      - Request ACR Update
    requestBody:
      required: true
      content:
        application/json:
          schema:
            $ref: '#/components/schemas/ACRUpdateData'
    responses:
      '200':
        description: >
          The communicated ACR update information was successfully received.
          The response body contains the feedback of the EES.
        content:
          application/json:
            schema:
              $ref: '#/components/schemas/ACRDataStatus'
      '204':
        description: >
          No Content. The communicated ACR update information was 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:

```

ACRUpdateData:
  description: >
    Represents the parameters to update the information related to ACR (e.g. indicate
    the status of ACT, update the notification target address).
  type: object
  properties:
    easId:
      type: string
    acId:
      type: string
    actResultInfo:
      $ref: '#/components/schemas/ACTResultInfo'
    e3SubscIds:
      type: array
      items:
        type: string
      minItems: 1
    e3NotificationUri:
      $ref: 'TS29122_CommonData.yaml#/components/schemas/Uri'
  required:
    - easId
  anyOf:
    - required: [actResultInfo]
    - required: [e3SubscIds]
    - required: [e3NotificationUri]

```

```

ACRDataStatus:
  description: Represents the ACR status information.
  type: object
  properties:
    e3SubscsStatus:
      $ref: '#/components/schemas/E3SubscsStatus'
    e3SubscIds:
      type: array
      items:
        type: string
      minItems: 1
  required:
    - e3SubscsStatus

```

```

ACTResultInfo:
  description: Represents the result of ACT and the related information.
  type: object
  properties:
    actResult:
      $ref: '#/components/schemas/ACTResult'
    actFailureCause:
      $ref: '#/components/schemas/ACTFailureCause'
    ueId:
      $ref: 'TS29571_CommonData.yaml#/components/schemas/Gpsi'
    easEndPoint:
      $ref: 'TS29558_Eees_EASRegistration.yaml#/components/schemas/EndPoint'
  required:
    - actResult
    - ueId
    - easEndPoint

```

ENUMS:

```

ACTResult:
  anyOf:
    - type: string
      enum:
        - SUCCESSFUL
        - FAILED
    - 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 result of ACT.
    Possible values are:
    - SUCCESSFUL: Indicates that the ACT was successful.
    - FAILED: Indicates that the ACT failed.

E3SubscsStatus:
  anyOf:
    - type: string
      enum:
        - SUCCESSFUL
        - FAILED
    - 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 status of the initialization of EDGE-3 subscriptions.
    Possible values are:
    - SUCCESSFUL: Indicates that the initialization of EDGE-3 subscriptions was successful.
    - FAILED: Indicates that the initialization of EDGE-3 subscriptions failed.

ACTFailureCause:
  anyOf:
    - type: string
      enum:
        - ACR_CANCELLATION
        - OTHER
    - 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 cause of ACT failure.
    Possible values are:
    - ACR_CANCELLATION: Indicates that the ACT failed due to the cancellation of the ACR.
    - OTHER: Indicates that the ACT failed for other reasons.

```

A.11 Eecs_EESRegistration API

openapi: 3.0.0

info:

```

title: ECS EES Registration_API
description: |
  API for EES Registration.
  © 2024, 3GPP Organizational Partners (ARIB, ATIS, CCSA, ETSI, TSDSI, TTA, TTC).
  All rights reserved.
version: 1.1.0

```

externalDocs:

```

description: >
  3GPP TS 29.558 V18.6.0 Enabling Edge Applications;
  Application Programming Interface (API) specification; Stage 3
url: https://www.3gpp.org/ftp/Specs/archive/29_series/29.558/

```

security:

```

- {}
- oAuth2ClientCredentials: []

```

servers:

```

- url: '{apiRoot}/eecs-eesregistration/v1'
  variables:
    apiRoot:
      default: https://example.com

```

description: apiRoot as defined in clause 7.5 of 3GPP TS 29.558.

paths:

/registrations:

post:

summary: Create a new EES Registration

operationId: CreateEESRegistration

tags:

- EES Registrations (Collection)

description: Registers a new EES at the Edge Configuration Server.

requestBody:

required: true

content:

application/json:

schema:

\$ref: '#/components/schemas/EESRegistration'

responses:

'201':

description: EES information is registered successfully at ECS.

content:

application/json:

schema:

\$ref: '#/components/schemas/EESRegistration'

headers:

Location:

description: 'Contains the URI of the newly created 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'

/registrations/{registrationId}:

get:

summary: Get an Individual EES Registration

operationId: GetIndEESReg

tags:

- Individual EES Registration (Document)

description: Retrieve an Individual EES registration resource.

parameters:

- name: registrationId

in: path

description: Registration Id.

required: true

schema:

type: string

responses:

'200':

description: OK (The EES registration information at the Edge Configuration Server).

content:

application/json:

schema:

\$ref: '#/components/schemas/EESRegistration'

'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: Update an Individual EES Registration
  operationId: UpdateIndEESReg
  tags:
    - Individual EES Registration (Document)
  description: Fully replace an existing EES Registration resource.
  parameters:
    - name: registrationId
      in: path
      description: EES Registration Id.
      required: true
      schema:
        type: string
  requestBody:
    required: true
    content:
      application/json:
        schema:
          $ref: '#/components/schemas/EESRegistration'
  responses:
    '200':
      description: OK (The EES registration information is updated successfully).
      content:
        application/json:
          schema:
            $ref: '#/components/schemas/EESRegistration'
    '204':
      description: >
        No Content. The individual EES registration information is updated successfully.
    '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: Modify an Individual EES Registration
  operationId: ModifyIndEESReg
  tags:
    - Individual EES Registration (Document)
  description: Partially update an existing EES Registration resource.

```

```

parameters:
  - name: registrationId
    in: path
    description: EES registration Id.
    required: true
    schema:
      type: string
requestBody:
  description: Partial update an existing EES registration resource.
  required: true
  content:
    application/merge-patch+json:
      schema:
        $ref: '#/components/schemas/EESRegistrationPatch'
responses:
  '200':
    description: >
      The Individual EES registration is successfully modified and
      the updated registration information is returned in the response.
    content:
      application/json:
        schema:
          $ref: '#/components/schemas/EESRegistration'
  '204':
    description: >
      No Content. The individual EES registration information is updated successfully.
  '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: Delete an Individual EES Registration
  operationId: DeleteIndEESReg
  tags:
    - Individual EES Registration (Document)
  description: Delete an existing EES registration at ECS.
  parameters:
    - name: registrationId
      in: path
      description: Registration Id.
      required: true
      schema:
        type: string
  responses:
    '204':
      description: The individual EES registration is 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:

```

EESRegistration:
  type: object
  description: Represents an EES registration information.
  properties:
    eesProf:
      $ref: '#/components/schemas/EESProfile'
    expTime:
      $ref: 'TS29122_CommonData.yaml#/components/schemas/DateTime'
    suppFeat:
      $ref: 'TS29571_CommonData.yaml#/components/schemas/SupportedFeatures'
  required:
    - eesProf

```

EESProfile:

```

  type: object
  description: Represents the EES profile information.
  properties:
    eesId:
      type: string
      description: Identifier of the EES.
    endPt:
      $ref: 'TS29558_Eees_EASRegistration.yaml#/components/schemas/EndPoint'
    easIds:
      type: array
      items:
        type: string
      minItems: 1
      description: Application identifiers of EASs that are registered with EES.
    easBdlInfos:
      type: object
      additionalProperties:
        type: array
        items:
          $ref: 'TS29558_Eees_EASRegistration.yaml#/components/schemas/EASBundleInfo'
      minItems: 1
      minProperties: 1
      description: >
        The key used in this map for each entry is the EAS ID of the concerned EAS.
        Within each EASBundleInfo encoded map entry of this attribute, the "mainEasId" attribute
        shall not be present.
    ednInfoSets:
      $ref: '#/components/schemas/EDNInfo'
    easInstInfo:
      type: object
      additionalProperties:
        $ref: '#/components/schemas/EASInstantiationInfo'
      minProperties: 1
      description: >
        Represents the EAS instantiation information for the EAS(s) registered at the EES.
        The key of the map shall be the EAS ID to which the provided instantiation information
        within the map value relates.
    provId:
      type: string
      description: Identifier of the ECSP that provides the EES provider.
    svcArea:
      $ref: '#/components/schemas/ServiceArea'
    appLocs:

```

```

    type: array
    items:
      $ref: 'TS29571_CommonData.yaml#/components/schemas/Dnai'
    minItems: 1
    description: List of DNAI(s) associated with the EES.
  svcContSupp:
    type: array
    items:
      $ref: '#/components/schemas/ACRScenario'
    minItems: 1
    description: The ACR scenarios supported by the EES for service continuity.
  svcContSuppExt1:
    type: array
    items:
      $ref: 'TS29558_Eees_EASRegistration.yaml#/components/schemas/EASBundleInfo'
    minItems: 1
    description: >
      Represents the information related to the EES ability to handle bundled EAS ACRs.
      This attribute may be present only when the "svcContSupp" attribute is also present.
      When this attribute is present, it indicates that the EES (identified by the "eesId"
      attribute) is able to handle bundled EAS ACRs and contains the information of the EAS
      bundle(s) for which the EES is able to handle bundled EAS ACRs.
  eecRegConf:
    type: boolean
    description: >
      Set to true if the EEC is required to register to the EES to use edge service.
      Set to false if the EEC is not required to register to use edge services. Default
      Value is false if omitted.
  required:
  - eesId
  - endPt
  - eecRegConf

EESRegistrationPatch:
  type: object
  description: Represents partial update request of individual EES registration information.
  properties:
    eesProf:
      $ref: '#/components/schemas/EESProfile'
    expTime:
      $ref: 'TS29571_CommonData.yaml#/components/schemas/DateTimeRm'

ServiceArea:
  type: object
  description: Represents a service area information of the EdgeApp entity.
  properties:
    topServAr:
      $ref: '#/components/schemas/TopologicalServiceArea'
    geoServAr:
      $ref: '#/components/schemas/GeographicalServiceArea'

TopologicalServiceArea:
  type: object
  description: Represents topological service area information.
  properties:
    ecgis:
      type: array
      items:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/Ecgi'
      minItems: 1
      description: A list of E-UTRA cell identities.
    ncgis:
      type: array
      items:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/Ncgi'
      minItems: 1
      description: A list of NR cell identities.
    tais:
      type: array
      items:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/Tai'
      minItems: 1
      description: A list of tracking area identities.
    plmnIds:
      type: array
      items:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/PlmnIdNid'
      minItems: 1

```

```

    description: A list of serving network identities.

GeographicalServiceArea:
  type: object
  description: Represents geographical service area information.
  properties:
    geoArs:
      type: array
      items:
        $ref: 'TS29572_Nlmf_Location.yaml#/components/schemas/GeographicArea'
      minItems: 1
      description: A list of geographic area information.
    civicAdrs:
      type: array
      items:
        $ref: 'TS29572_Nlmf_Location.yaml#/components/schemas/CivicAddress'
      minItems: 1
      description: A list of civic address information.

EASInstantiationInfo:
  type: object
  description: Represents the EAS instantiation information.
  properties:
    easId:
      type: string
      description: Identifier of the EAS.
    status:
      $ref: '#/components/schemas/InstantiationStatus'
    instCrit:
      $ref: '#/components/schemas/InstantiationCriteria'
  required:
    - easId
    - status

InstantiationCriteria:
  type: object
  description: Represents the instantiation criteria for an EAS.
  properties:
    instantiationTime:
      $ref: 'TS29122_CommonData.yaml#/components/schemas/DateTime'
    instWindows:
      type: array
      items:
        $ref: 'TS29122_CommonData.yaml#/components/schemas/TimeWindow'
      minItems: 1
      description: A list time windows at which the EAS is instantiated.
    scheds:
      type: array
      items:
        $ref: 'TS29122_CpProvisioning.yaml#/components/schemas/ScheduledCommunicationTime'
      minItems: 1
      description: Represents the EAS instantiation schedule.
  oneOf:
    - required: [instantiationTime]
    - required: [instWindows]
    - required: [scheds]

EDNInfo:
  type: object
  description: Represents EDN related information.
  properties:
    dnn:
      $ref: 'TS29571_CommonData.yaml#/components/schemas/Dnn'
    dnais:
      type: array
      items:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/Dnai'
      minItems: 1
  required:
    - dnn

ACRScenario:
  anyOf:
  - type: string
  - enum:
    - EEC_INITIATED
    - EEC_EXECUTED_VIA_SOURCE_EES
    - EEC_EXECUTED_VIA_TARGET_EES

```

```

- SOURCE_EAS_DECIDED
- SOURCE_EES_EXECUTED
- EEL_MANAGED_ACR
- type: string
description: >
  This string provides forward-compatibility with future
  extensions to the enumeration but is not used to encode
  content defined in the present version of this API.
description: |
  Represents the ACR scenarios supported by EES.
  Possible values are:
- EEC_INITIATED: Represents the EEC initiated ACR scenario.
- EEC_EXECUTED_VIA_SOURCE_EES: Represents the EEC ACR scenario executed via the S-EES.
- EEC_EXECUTED_VIA_TARGET_EES: Represents the EEC ACR scenario executed via the T-EES.
- SOURCE_EAS_DECIDED: Represents the EEC ACR scenario where the S-EAS decides to perform
  ACR.
- SOURCE_EES_EXECUTED: Represents the EEC ACR scenario where S-EES executes the ACR.
- EEL_MANAGED_ACR: Represents the EEC ACR scenario where the ACR is managed by the

  Edge Enabler Layer.

InstantiationStatus:
  anyOf:
  - type: string
    enum:
    - INSTANTIATED
    - INSTANTIABLE
  - type: string
    description: >
      This string provides forward-compatibility with future
      extensions to the enumeration but is not used to encode
      content defined in the present version of this API.
  description: |
    Represents the instantiation status information of an EAS.
    Possible values are:
    - INSTANTIATED: Indicates that the EAS status is instantiated.
    - INSTANTIABLE: Indicates that the EAS status is instantiable but not yet instantiated.

```

A.12 Eecs_TargetEESDiscovery API

```

openapi: 3.0.0
info:
  title: ECS Target EES Discovery API
  description: |
    API for Target EES Discovery.
    © 2025, 3GPP Organizational Partners (ARIB, ATIS, CCSA, ETSI, TSDSI, TTA, TTC).
    All rights reserved.
  version: 1.1.2
externalDocs:
  description: >
    3GPP TS 29.558 V18.10.0 Enabling Edge Applications;
    Application Programming Interface (API) specification; Stage 3
  url: https://www.3gpp.org/ftp/Specs/archive/29_series/29.558/
security:
- {}
- oAuth2ClientCredentials: []
servers:
- url: '{apiRoot}/eecs-targeteesdiscovery/v1'
  variables:
    apiRoot:
      default: https://example.com
      description: apiRoot as defined in clause 7.5 of 3GPP TS 29.558.

paths:
  /ees-profiles:
    get:
      summary: Read all the targeted Enabler Server Profiles
      operationId: GetEESProfiles
      tags:
      - EES Profiles (Collection)
      description: Retrieve the T-EES information.
      parameters:
      - name: ees-id

```

```

    in: query
    description: Unique identifier of the source Enabler Server.
    required: true
    schema:
      type: string
- name: eas-id
  in: query
  description: Unique identifier of the source Application Server.
  required: true
  schema:
    type: string
- name: target-dnai
  in: query
  description: >
    The DNAI information associated with the potential target Enabler Server(s)
    and/or target Application Server(s).
  required: false
  schema:
    $ref: 'TS29571_CommonData.yaml#/components/schemas/Dnai'
- name: ue-id
  in: query
  description: Identifier of the UE.
  required: false
  schema:
    $ref: 'TS29571_CommonData.yaml#/components/schemas/Gpsi'
- name: ue-location
  in: query
  description: The location information of the UE.
  required: false
  schema:
    $ref: 'TS29122_CommonData.yaml#/components/schemas/LocationArea5G'
- name: eec-srv-cont-supp
  in: query
  description: >
    Indicates whether the EEC supports service continuity or not and the related service
    continuity support information.
  required: false
  schema:
    $ref:
'TS29558_Eees_EECContextRelocation.yaml#/components/schemas/EECSrvContinuitySupport'
- name: ac-svc-cont-supp
  in: query
  description: >
    Indicates that the AC supports service continuity and contains the related service
    continuity support information (i.e., supported ACR scenarios).
  required: false
  schema:
    type: array
    items:
      $ref: 'TS29558_Eecs_EESRegistration.yaml#/components/schemas/ACRScenario'
    minItems: 1
- name: bdl-id
  in: query
  description: >
    Contains EAS bundle identifier.
  required: false
  schema:
    type: string
- name: bdl-type
  in: query
  description: >
    Contains EAS bundle type.
  required: false
  schema:
    $ref: 'TS29558_Eees_EASRegistration.yaml#/components/schemas/BdlType'
- name: ens-ind
  in: query
  description: indicates whether edge node sharing is requested.
  required: false
  schema:
    type: boolean
    description: >
      Set to true if edge node sharing is requested.
      Set to false if edge node sharing is not requested.
      The default value when omitted is false.
- name: app-grp-id
  in: query
  description: >

```

```

    Contains the application group identifier.
    required: false
    schema:
      type: string
  - name: supp-feats
    in: query
    description: Contains the list of supported feature(s).
    required: false
    schema:
      $ref: 'TS29571_CommonData.yaml#/components/schemas/SupportedFeatures'
responses:
  '200':
    description: >
      The EDN configuration and the Enabler Server information determined by the ECS.
    content:
      application/json:
        schema:
          $ref: 'TS24558_Eecs_ServiceProvisioning.yaml#/components/schemas/ECSServProvResp'
  '400':
    $ref: 'TS29122_CommonData.yaml#/components/responses/400'
  '401':
    $ref: 'TS29122_CommonData.yaml#/components/responses/401'
  '403':
    $ref: 'TS29122_CommonData.yaml#/components/responses/403'
  '404':
    $ref: 'TS29122_CommonData.yaml#/components/responses/404'
  '406':
    $ref: 'TS29122_CommonData.yaml#/components/responses/406'
  '429':
    $ref: 'TS29122_CommonData.yaml#/components/responses/429'
  '500':
    $ref: 'TS29122_CommonData.yaml#/components/responses/500'
  '503':
    $ref: 'TS29122_CommonData.yaml#/components/responses/503'
  default:
    $ref: 'TS29122_CommonData.yaml#/components/responses/default'

components:
  securitySchemes:
    oAuth2ClientCredentials:
      type: oauth2
      flows:
        clientCredentials:
          tokenUrl: '{tokenUrl}'
          scopes: {}

```

A.13 Eees_ACRParameterInformation API

openapi: 3.0.0

info:

```

title: EES ACR Parameters Information Service
version: 1.0.0
description: |
  EES ACR Parameters Information Service.
  © 2024, 3GPP Organizational Partners (ARIB, ATIS, CCSA, ETSI, TSDSI, TTA, TTC).
  All rights reserved.

```

externalDocs:

```

description: >
  3GPP TS 29.558 V18.6.0; Enabling Edge Applications;
  Application Programming Interface (API) specification; Stage 3.
url: https://www.3gpp.org/ftp/Specs/archive/29_series/29.558/

```

security:

```

- {}
- oAuth2ClientCredentials: []

```

servers:

```

- url: '{apiRoot}/eees-acr-param/v1'
  variables:
    apiRoot:
      default: https://example.com
      description: apiRoot as defined in clause 5.2.4 of 3GPP TS 29.122

```

```

paths:
  /send-acrparamsinfo:
    post:
      summary: Request to send ACR parameters information.
      operationId: Request
      tags:
        - Send ACR Parameter Information
      requestBody:
        required: true
        content:
          application/json:
            schema:
              $ref: '#/components/schemas/ACRParamsInfo'
      responses:
        '204':
          description: >
            No Content. The ACR parameter information 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:
  ACRParamsInfo:
    description: >
      Represents the ACR parameters information.
    type: object
    properties:
      requestorId:
        type: string
      eecId:
        type: string
      acId:
        type: string
      sAsEndPoint:
        $ref: 'TS29558_Eees_EASRegistration.yaml#/components/schemas/EndPoint'
      tAsEndPoint:
        $ref: 'TS29558_Eees_EASRegistration.yaml#/components/schemas/EndPoint'
      acrParams:
        $ref: 'TS29558_Eees_ACRManagementEvent.yaml#/components/schemas/ACRParameters'
    required:
      - requestorId
      - eecId
      - acId
      - sAsEndPoint
      - tAsEndPoint

```

- acrParams

A.14 Ecas_SelectedEES API

openapi: 3.0.0

info:

```
title: Selected EES Service
version: 1.0.0
description: |
  Selected EES Service.
  © 2024, 3GPP Organizational Partners (ARIB, ATIS, CCSA, ETSI, TSDSI, TTA, TTC).
  All rights reserved.
```

externalDocs:

```
description: >
  3GPP TS 29.558 V18.6.0; Enabling Edge Applications;
  Application Programming Interface (API) specification; Stage 3.
url: https://www.3gpp.org/ftp/Specs/archive/29\_series/29.558/
```

security:

```
- {}
- oAuth2ClientCredentials: []
```

servers:

```
- url: '{apiRoot}/ecas-selected-ees/v1'
  variables:
    apiRoot:
      default: https://example.com
      description: apiRoot as defined in clause 5.2.4 of 3GPP TS 29.122
```

paths:

```
/declare:
  post:
    summary: Declare the selected EES to the CAS.
    operationId: DeclareSelectedEES
    tags:
      - Declare Selected EES
    requestBody:
      required: true
      content:
        application/json:
          schema:
            $ref: '#/components/schemas/SeleESDecInfo'
    responses:
      '204':
        description: >
          No Content. The Selected EES Declaration request is received
          successfully.
      '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:
```

```
  SeleESDecInfo:
    description: >
      Represents the information elements for the selected EES declaration.
    type: object
    properties:
      ueId:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/Gpsi'
      seleEesId:
        type: string
      seleEndpoint:
        $ref: 'TS29558_Eees_EASRegistration.yaml#/components/schemas/EndPoint'
      easId:
        type: string
      acId:
        type: string
      suppFeat:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/SupportedFeatures'
    required:
      - ueId
      - seleEesId
      - seleEndpoint
      - easId
```

A.15 Eees_CommonEASAnnouncement API

```
openapi: 3.0.0
```

```
info:
```

```
  title: EES Common EAS Announcement Service
  version: 1.0.0
  description: |
    EES Common EAS Announcement Service.
    © 2024, 3GPP Organizational Partners (ARIB, ATIS, CCSA, ETSI, TSDSI, TTA, TTC).
    All rights reserved.
```

```
externalDocs:
```

```
  description: >
    3GPP TS 29.558 V18.6.0; Enabling Edge Applications;
    Application Programming Interface (API) specification; Stage 3.
  url: https://www.3gpp.org/ftp/Specs/archive/29_series/29.558/
```

```
security:
```

```
  - {}
  - oAuth2ClientCredentials: []
```

```
servers:
```

```
  - url: '{apiRoot}/eees-cea/v1'
    variables:
      apiRoot:
        default: https://example.com
        description: apiRoot as defined in clause 5.2.4 of 3GPP TS 29.122
```

```
paths:
```

```
  /declare:
    post:
      summary: Request to declare common EAS information.
      operationId: Declare
      tags:
        - Declare common EAS Information
      requestBody:
        required: true
```

```

content:
  application/json:
    schema:
      $ref: '#/components/schemas/CommonEASInfo'
responses:
  '204':
    description: >
      No Content. The common EAS information is successfully received 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'

```

components:

```

securitySchemes:
  oAuth2ClientCredentials:
    type: oauth2
    flows:
      clientCredentials:
        tokenUrl: '{tokenUrl}'
        scopes: {}

```

```

schemas:
  CommonEASInfo:
    description: >
      Represents the common EAS information.
    type: object
    properties:
      requestorId:
        type: string
        description: Represents the identifier of the announcing EES sending the request.
      requestorEndPt:
        $ref: 'TS29558_Eees_EASRegistration.yaml#/components/schemas/EndPoint'
      easId:
        type: string
        description: Represents the EAS ID of the selected common EAS
      easEndPt:
        $ref: 'TS29558_Eees_EASRegistration.yaml#/components/schemas/EndPoint'
      appGrpId:
        type: string
        description: Represents the application group identifier.
    required:
      - requestorId
      - easId
      - easEndPt
      - appGrpId

```

A.16 Eecs_EASInfoManagement API

openapi: 3.0.0

info:

```
title: EAS Information Management
version: 1.0.0
description: |
  EAS Information Management Service.
  © 2024, 3GPP Organizational Partners (ARIB, ATIS, CCSA, ETSI, TSDSI, TTA, TTC).
  All rights reserved.
```

externalDocs:

```
description: >
  3GPP TS 29.558 V18.6.0; Enabling Edge Applications;
  Application Programming Interface (API) specification; Stage 3.
url: https://www.3gpp.org/ftp/Specs/archive/29\_series/29.558/
```

security:

```
- {}
- oAuth2ClientCredentials: []
```

servers:

```
- url: '{apiRoot}/eecs-eim/v1'
  variables:
    apiRoot:
      default: https://example.com
      description: apiRoot as defined in clause 5.2.4 of 3GPP TS 29.122
```

paths:

```
/bindings:
  get:
    summary: Get EAS information.
    operationId: GetEASInfo
    tags:
      - Get EAS information
    parameters:
      - name: requestor-id
        in: query
        description: Represents the Identifier of the service consumer.
        required: true
        schema:
          type: string
      - name: app-group-id
        in: query
        description: Represents the Application group identifier.
        required: true
        schema:
          type: string
      - name: eas-id
        in: query
        description: EAS Identifier.
        required: true
        schema:
          type: string
      - name: supp-feats
        in: query
        description: Contains the list of supported feature(s).
        required: false
        schema:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/SupportedFeatures'
    responses:
      '200':
        description: OK. Resource representation is returned.
        content:
          application/json:
            schema:
              $ref: '#/components/schemas/CommonEASBindResp'
      '204':
        description: >
          No Content. There is no Common EAS Binding Information corresponding to the received
          query parameters.
      '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 to store the Common EAS information.
operationId: StoreEasInfo
tags:
  - Store EAS Information
requestBody:
  required: true
  content:
    application/json:
      schema:
        $ref: '#/components/schemas/CommonEASBindReq'
responses:
  '201':
    description: >
      Created. The Common EAS Binding information is successfully stored.
    content:
      application/json:
        schema:
          $ref: '#/components/schemas/CommonEASBindResp'
    headers:
      Location:
        description: >
          Contains the URI of the created Common EAS Binding information resource.
        required: true
        schema:
          type: string
  '400':
    $ref: 'TS29122_CommonData.yaml#/components/responses/400'
  '401':
    $ref: 'TS29122_CommonData.yaml#/components/responses/401'
  '403':
    description: >
      Forbidden. There is an existing Common EAS information stored.
    content:
      application/json:
        schema:
          $ref: '#/components/schemas/ProblemDetailsEIMExt'
  '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:
  CommonEASBindReq:
    description: >
      Represents the information elements for the Common EAS information
    type: object
    properties:
      requestorId:
        type: string
      binding:
        $ref: '#/components/schemas/CommonEASBinding'
      suppFeat:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/SupportedFeatures'
    required:
      - requestorId
      - binding

  CommonEASBindResp:
    description: >
      Represents the response information elements for the Common EAS information.
    type: object
    properties:
      binding:
        $ref: '#/components/schemas/CommonEASBinding'
      suppFeat:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/SupportedFeatures'
    required:
      - binding

  CommonEASBinding:
    description: Represents the common EAS Binding information.
    type: object
    properties:
      appGroupId:
        type: string
      easId:
        type: string
      easEndpoints:
        type: array
        items:
          $ref: 'TS29558_Eees_EASRegistration.yaml#/components/schemas/EndPoint'
        minItems: 1
      eesEndpoint:
        $ref: 'TS29558_Eees_EASRegistration.yaml#/components/schemas/EndPoint'
      ednInfo:
        $ref: 'TS29558_Eees_EESRegistration.yaml#/components/schemas/EDNInfo'
    required:
      - appGroupId
      - easId
      - easEndpoints

  ProblemDetailsEIMExt:
    description: >
      Extends ProblemDetails to also include existing common EAS binding information for the
      application group.
    allOf:
      - $ref: 'TS29122_CommonData.yaml#/components/schemas/ProblemDetails'
      - $ref: '#/components/schemas/CommonEASBinding'

```

A.17 Eees_TrafficInfluenceEAS API

openapi: 3.0.0

```

info:
  title: EES Application Traffic Influence Service
  version: 1.0.0
  description: |
    EES Application Traffic Influence Service.
    © 2024, 3GPP Organizational Partners (ARIB, ATIS, CCSA, ETSI, TSDSI, TTA, TTC).
    All rights reserved.

```

```
externalDocs:
  description: >
    3GPP TS 29.558 V18.6.0; Enabling Edge Applications;
    Application Programming Interface (API) specification; Stage 3.
  url: https://www.3gpp.org/ftp/Specs/archive/29_series/29.558/

security:
- {}
- OAuth2ClientCredentials: []

servers:
- url: '{apiRoot}/eees-tie/v1'
  variables:
    apiRoot:
      default: https://example.com
      description: apiRoot as defined in clause 5.2.4 of 3GPP TS 29.122

paths:
  /instances:
    post:
      summary: Create application traffic influence trigger from EAS.
      operationId: CreateTraffInfluInstance
      tags:
      - Traffic Influence (Document)
      requestBody:
        required: true
        content:
          application/json:
            schema:
              $ref: '#/components/schemas/AppTrafficInfluence'
      responses:
        '201':
          description: Create a new individual Application Traffic Influence Instance.
          headers:
            Location:
              description: Contains the URI of the newly created resource.
              required: true
              schema:
                type: string
          content:
            application/json:
              schema:
                $ref: '#/components/schemas/AppTrafficInfluence'
        '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'

  /instances/{instanceId}:
    parameters:
      - name: instanceId
        in: path
        description: Instance Id.
        required: true
        schema:
          type: string

    get:
      summary: Read an Individual Application Traffic Influence Instance.
      operationId: GetIndTraffInfluInstance
```

```

tags:
- Individual ACR Management Events Subscription (Document)
responses:
'200':
  description: OK. The Individual Application Traffic Influence Instance is returned.
  content:
    application/json:
      schema:
        $ref: '#/components/schemas/AppTrafficInfluence'
'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: Update an Individual Application Traffic Influence Instance.
operationId: UpdateIndTraffInfluInstance
tags:
- Individual Traffic Influence Instance (Document)
requestBody:
  required: true
  content:
    application/json:
      schema:
        $ref: '#/components/schemas/AppTrafficInfluence'
responses:
'200':
  description: >
    The Individual Application Traffic Influence Instance is successfully modified and the
    representation of the updated resource is returned in the response body.
  content:
    application/json:
      schema:
        $ref: '#/components/schemas/AppTrafficInfluence'
'204':
  description: No Content.
'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: Modify an Individual Application Traffic Influence Instance.
  operationId: ModifyIndTraffInfluInstance
  tags:
    - Individual Traffic Influence Instance (Document)
  requestBody:
    required: true
    content:
      application/merge-patch+json:
        schema:
          $ref: '#/components/schemas/AppTrafficInfluencePatch'
  responses:
    '200':
      description: >
        The Individual Application Traffic Influence Instance is successfully modified and the
        representation of the updated resource is returned in the response.
      content:
        application/json:
          schema:
            $ref: '#/components/schemas/AppTrafficInfluence'
    '204':
      description: No Content.
    '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: Delete an Individual Traffic Influence Instance.
  operationId: DeleteIndTraffInfluInstance
  tags:
    - Individual Traffic Influence Instance (Document)
  responses:
    '204':
      description: >
        The Individual Traffic Influence Instance 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'
```

```
$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:  
  AppTrafficInfluence:  
    description: >  
      Represents the application traffic influence information.  
    type: object  
    properties:  
      requestorId:  
        type: string  
        description: Contains the identifier of the service consumer that is sending the request.  
      tgtUes:  
        type: array  
        items:  
          $ref: 'TS29558_Eees_ACRManagementEvent.yaml#/components/schemas/TargetUeIdentification'  
        minItems: 1  
      addTgtUes:  
        type: array  
        items:  
          $ref: 'TS29558_Eees_ACRManagementEvent.yaml#/components/schemas/TargetUeIdentification'  
        minItems: 1  
      deleTgtUes:  
        type: array  
        items:  
          $ref: 'TS29558_Eees_ACRManagementEvent.yaml#/components/schemas/TargetUeIdentification'  
        minItems: 1  
      anyUe:  
        type: boolean  
        description: >  
          Indicates whether the request applies to any UE.  
          true indicates that the request applies to any UE.  
          False indicates that the request does not apply to any UE.  
          The default value when this attribute is omitted is false.  
      suppFeat:  
        $ref: 'TS29571_CommonData.yaml#/components/schemas/SupportedFeatures'  
  
  AppTrafficInfluencePatch:  
    description: >  
      Represents the update of application traffic influence information.  
    type: object  
    properties:  
      addTgtUes:  
        type: array  
        items:  
          $ref: 'TS29558_Eees_ACRManagementEvent.yaml#/components/schemas/TargetUeIdentification'  
        minItems: 1  
      deleTgtUes:  
        type: array  
        items:  
          $ref: 'TS29558_Eees_ACRManagementEvent.yaml#/components/schemas/TargetUeIdentification'  
        minItems: 1  
      anyUe:  
        type: boolean  
        description: >  
          Indicates whether the request applies to any UE.  
          true indicates that the request applies to any UE.  
          False indicates that the request does not apply to any UE.
```

A.18 Eecs_ECSServiceProvisioning API

openapi: 3.0.0

info:

```
title: ECS Service Provisioning Service
version: 1.0.3
description: |
  ECS Service Provisioning Service.
  © 2025, 3GPP Organizational Partners (ARIB, ATIS, CCSA, ETSI, TSDSI, TTA, TTC).
  All rights reserved.
```

externalDocs:

```
description: >
  3GPP TS 29.558 V18.10.0; Enabling Edge Applications;
  Application Programming Interface (API) specification; Stage 3.
url: https://www.3gpp.org/ftp/Specs/archive/29_series/29.558/
```

servers:

```
- url: '{apiRoot}/eecs-esp/v1'
  variables:
    apiRoot:
      default: https://example.com
      description: apiRoot as defined in clause 5.2.4 of 3GPP TS 29.122
```

security:

```
- {}
- oAuth2ClientCredentials: []
```

paths:

```
/request:
  post:
    summary: Enables to request service provisioning information.
    operationId: ServProvRetReq
    tags:
      - Service Provisioning Information Retrieval Request
    requestBody:
      required: true
      content:
        application/json:
          schema:
            $ref: '#/components/schemas/ServProvReq'
    responses:
      '200':
        description: >
          OK. The requested service provisioning information shall be returned in the response
          body.
        content:
          application/json:
            schema:
              $ref: '#/components/schemas/ServProvResp'
      '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:
  post:
    summary: Request the creation of a Service Provisioning Subscription.
    operationId: CreateServProvSubsc
    tags:
      - Service Provisioning Subscriptions (Collection)
    requestBody:
      required: true
      content:
        application/json:
          schema:
            $ref: '#/components/schemas/ServProvSubsc'
    responses:
      '201':
        description: >
          Created. The Service Provisioning Subscription is successfully created and a
          representation of the created Individual Service Provisioning Subscription resource
          shall be returned.
        content:
          application/json:
            schema:
              $ref: '#/components/schemas/ServProvSubsc'
        headers:
          Location:
            description: >
              Contains the URI of the created Individual Service Provisioning 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:
        $ref: 'TS29122_CommonData.yaml#/components/responses/default'
    callbacks:
      ServProvNotif:
        '{$request.body#/notifUri}':
          post:
            requestBody:
              required: true
              content:
                application/json:
                  schema:
                    $ref: '#/components/schemas/ServProvNotif'
            responses:
              '204':
                description: >
                  No Content. The Service Provisioning 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 Service Provisioning Subscription resource.
      required: true
      schema:
        type: string

```

```

  get:

```

```

    summary: Retrieve an existing Individual Service Provisioning Subscription resource.

```

```

    operationId: GetIndServProvSubsc

```

```

    tags:

```

```

      - Individual Service Provisioning Subscription (Document)

```

```

    responses:

```

```

      '200':

```

```

        description: >

```

```

          OK. The requested Individual Service Provisioning Subscription resource shall be
          returned.

```

```

        content:

```

```

          application/json:

```

```

            schema:

```

```

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

```

```

      '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 Service Provisioning Subscription
    resource.

```

```

    operationId: UpdateIndServProvSubsc

```

```

    tags:

```

```

      - Individual Service Provisioning Subscription (Document)

```

```

    requestBody:

```

```

      required: true

```

```

      content:

```

```

        application/json:

```

```

          schema:

```

```

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

```

```

    responses:

```

```

      '200':

```

```

description: >
  OK. The Individual Service Provisioning 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/ServProvSubsc'
'204':
  description: >
    No Content. The Individual Service Provisioning 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'
'406':
  $ref: 'TS29122_CommonData.yaml#/components/responses/406'
'429':
  $ref: 'TS29122_CommonData.yaml#/components/responses/429'
'500':
  $ref: 'TS29122_CommonData.yaml#/components/responses/500'
'503':
  $ref: 'TS29122_CommonData.yaml#/components/responses/503'
default:
  $ref: 'TS29122_CommonData.yaml#/components/responses/default'

```

patch:

summary: Request the modification of an existing Individual Service Provisioning Subscription resource.

operationId: ModifyIndServProvSubsc

tags:

- Individual Service Provisioning Subscription (Document)

requestBody:

required: true

content:

application/merge-patch+json:

schema:

\$ref: '#/components/schemas/ServProvSubscPatch'

responses:

'200':

description: >

OK. The Individual Service Provisioning 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/ServProvSubsc'

'204':

description: >

No Content. The Individual Service Provisioning 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'

'406':

\$ref: 'TS29122_CommonData.yaml#/components/responses/406'

'429':

\$ref: 'TS29122_CommonData.yaml#/components/responses/429'

'500':

\$ref: 'TS29122_CommonData.yaml#/components/responses/500'

'503':

```

    $ref: 'TS29122_CommonData.yaml#/components/responses/503'
  default:
    $ref: 'TS29122_CommonData.yaml#/components/responses/default'

delete:
  summary: Request the deletion of an existing Individual Service Provisioning Subscription
  resource.
  operationId: DeleteIndServProvSubsc
  tags:
    - Individual Service Provisioning Subscription (Document)
  responses:
    '204':
      description: >
        No Content. The Individual Service Provisioning Subscription resource is successfully
        deleted.
    '307':
      $ref: 'TS29122_CommonData.yaml#/components/responses/307'
    '308':
      $ref: 'TS29122_CommonData.yaml#/components/responses/308'
    '400':
      $ref: 'TS29122_CommonData.yaml#/components/responses/400'
    '401':
      $ref: 'TS29122_CommonData.yaml#/components/responses/401'
    '403':
      $ref: 'TS29122_CommonData.yaml#/components/responses/403'
    '404':
      $ref: 'TS29122_CommonData.yaml#/components/responses/404'
    '406':
      $ref: 'TS29122_CommonData.yaml#/components/responses/406'
    '429':
      $ref: 'TS29122_CommonData.yaml#/components/responses/429'
    '500':
      $ref: 'TS29122_CommonData.yaml#/components/responses/500'
    '503':
      $ref: 'TS29122_CommonData.yaml#/components/responses/503'
  default:
    $ref: 'TS29122_CommonData.yaml#/components/responses/default'

components:
  securitySchemes:
    oAuth2ClientCredentials:
      type: oauth2
      flows:
        clientCredentials:
          tokenUrl: '{tokenUrl}'
          scopes: {}

  schemas:

#
# STRUCTURED DATA TYPES
#

ServProvReq:
  description: >
    Represents a Service Provisioning information retrieval request.
  type: object
  properties:
    fedInfo:
      type: array
      items:
        $ref: '#/components/schemas/FederationInfo'
      minItems: 1
    acProfs:
      type: array
      items:
        $ref: 'TS24558_Eees_EECRegistration.yaml#/components/schemas/ACProfile'
      minItems: 1
    connInfo:
      type: array
      items:
        $ref: 'TS24558_Eecs_ServiceProvisioning.yaml#/components/schemas/ConnectivityInfo'
      minItems: 1
    locInfo:
      $ref: 'TS29122_MonitoringEvent.yaml#/components/schemas/LocationInfo'
    suppFeat:

```

```
    $ref: 'TS29571_CommonData.yaml#/components/schemas/SupportedFeatures'
```

ServProvResp:

- description: >
Represents a Service Provisioning information retrieval response.
- type: object
- properties:
 - ednConfigInfo:
 - type: array
 - items:
 - \$ref: 'TS24558_Eecs_ServiceProvisioning.yaml#/components/schemas/EDNConfigInfo'
 - minItems: 1
 - suppFeat:
 - \$ref: 'TS29571_CommonData.yaml#/components/schemas/SupportedFeatures'
- required:
 - ednConfigInfo

ServProvSubsc:

- description: >
Represents a Service Provisioning Subscription.
- type: object
- properties:
 - notifUri:
 - \$ref: 'TS29122_CommonData.yaml#/components/schemas/Uri'
 - fedInfo:
 - type: array
 - items:
 - \$ref: '#/components/schemas/FederationInfo'
 - minItems: 1
 - acProfs:
 - type: array
 - items:
 - \$ref: 'TS24558_Eees_EECRegistration.yaml#/components/schemas/ACProfile'
 - minItems: 1
 - connInfo:
 - type: array
 - items:
 - \$ref: 'TS24558_Eecs_ServiceProvisioning.yaml#/components/schemas/ConnectivityInfo'
 - minItems: 1
 - locInfo:
 - \$ref: 'TS29122_MonitoringEvent.yaml#/components/schemas/LocationInfo'
 - expTime:
 - \$ref: 'TS29122_CommonData.yaml#/components/schemas/DateTime'
 - suppFeat:
 - \$ref: 'TS29571_CommonData.yaml#/components/schemas/SupportedFeatures'
- required:
 - notifUri

ServProvSubscPatch:

- description: >
Represents the requested modifications to a Service Provisioning Subscription.
- type: object
- properties:
 - notifUri:
 - \$ref: 'TS29122_CommonData.yaml#/components/schemas/Uri'
 - fedInfo:
 - type: array
 - items:
 - \$ref: '#/components/schemas/FederationInfo'
 - minItems: 1
 - acProfs:
 - type: array
 - items:
 - \$ref: 'TS24558_Eees_EECRegistration.yaml#/components/schemas/ACProfile'
 - minItems: 1
 - connInfo:
 - type: array
 - items:
 - \$ref: 'TS24558_Eecs_ServiceProvisioning.yaml#/components/schemas/ConnectivityInfo'
 - minItems: 1
 - locInfo:
 - \$ref: 'TS29122_MonitoringEvent.yaml#/components/schemas/LocationInfo'
 - expTime:
 - \$ref: 'TS29122_CommonData.yaml#/components/schemas/DateTime'

ServProvNotif:

- description: >
Represents a Service Provisioning Notification.

```

    type: object
    properties:
      subscId:
        type: string
      ednConfigInfo:
        type: array
        items:
          $ref: 'TS24558_Eecs_ServiceProvisioning.yaml#/components/schemas/EDNConfigInfo'
        minItems: 1
      lifetime:
        $ref: 'TS29122_CommonData.yaml#/components/schemas/DurationSec'
    required:
      - subscId
      - ednConfigInfo

FederationInfo:
  description: >
    Represents federation agreements related information.
  type: object
  properties:
    federationId:
      type: string
  required:
    - federationId

# SIMPLE DATA TYPES
#

#
# ENUMERATIONS
#

```

A.19 Eecs_ECSDiscovery API

openapi: 3.0.0

```

info:
  title: ECS ECS Discovery Service
  version: 1.0.1
  description: |
    API for ECS Discovery
    © 2025, 3GPP Organizational Partners (ARIB, ATIS, CCSA, ETSI, TSDSI, TTA, TTC).
    All rights reserved.

externalDocs:
  description: >
    3GPP TS 29.558 V18.9.0 Enabling Edge Applications;
    Application Programming Interface (API) specification; Stage 3
  url: https://www.3gpp.org/ftp/Specs/archive/29_series/29.558/

security:
  - {}
  - OAuth2ClientCredentials: []

servers:
  - url: '{apiRoot}/eecs-ecsdisccovery/v1'
    variables:
      apiRoot:
        default: https://example.com
        description: apiRoot as defined in clause 7.5 of 3GPP TS 29.558.

paths:
  /ecs-info/discover:
    post:
      description: >
        Provides ECS information requested by the service consumer.
      operationId: GetECSDiscInfo
      tags:
        - ECS Information (Collection)
      requestBody:
        required: true
        content:
          application/json:
            schema:
              $ref: '#/components/schemas/EcsInfoDiscoveryReq'

```

```
responses:
  '200':
    description: The requested ECS discovery information was returned successfully.
    content:
      application/json:
        schema:
          $ref: '#/components/schemas/EcsInfoDiscoveryResp'
  '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:
  ECSDiscNotif:
    '{request.body#/notifUri}':
      post:
        requestBody:
          required: true
          content:
            application/json:
              schema:
                $ref: '#/components/schemas/EcsInfoDiscNotif'
        responses:
          '204':
            description: No Content (successful notification).
          '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:

```

EcsInfoDiscoveryReq:
  type: object
  description: Represents the ECS Discovery request information.
  properties:
    ecsAddr:
      $ref: 'TS29558_Eees_EASRegistration.yaml#/components/schemas/EndPoint'
    acProfs:
      type: array
      items:
        $ref: 'TS24558_Eees_EECRegistration.yaml#/components/schemas/ACProfile'
      minItems: 1
    connInf:
      type: array
      items:
        $ref: 'TS24558_Eecs_ServiceProvisioning.yaml#/components/schemas/ConnectivityInfo'
      minItems: 1
    ueLoc:
      type: array
      items:
        $ref: 'TS29122_MonitoringEvent.yaml#/components/schemas/LocationInfo'
      minItems: 1
    notifUri:
      $ref: 'TS29122_CommonData.yaml#/components/schemas/Uri'
    duration:
      $ref: 'TS29122_CommonData.yaml#/components/schemas/DateTime'
    suppFeat:
      $ref: 'TS29571_CommonData.yaml#/components/schemas/SupportedFeatures'
  required:
    - ecsAddr

```

```

EcsInfoDiscoveryResp:
  type: object
  description: Represents the ECS Discovrey response.
  properties:
    ecsInfo:
      type: array
      items:
        $ref: '#/components/schemas/EcsInfo'
      minItems: 1
  required:
    - ecsInfo

```

```

EcsInfo:
  type: object
  description: Represents the discovered ECS information.
  properties:
    ecs:
      $ref: '#/components/schemas/ECSProfile'
    lifeTime:
      $ref: 'TS29122_CommonData.yaml#/components/schemas/DateTime'
  required:
    - ecs

```

```

ECSProfile:
  type: object
  description: Represents the ECS profile information.
  properties:
    endPt:
      $ref: 'TS29558_Eees_EASRegistration.yaml#/components/schemas/EndPoint'
    ecspId:
      type: string
    splVal:
      $ref: 'TS29571_CommonData.yaml#/components/schemas/SpatialValidityCond'
    suppPlmns:
      type: array
      items:
        $ref: '#/components/schemas/SupportedPlmn'
      minItems: 1
  required:
    - endPt

```

SupportedPlmn:

```
type: object
description: Represents supported PLMN and the related ECSPs information.
properties:
  plmnId:
    $ref: 'TS29571_CommonData.yaml#/components/schemas/PlmnIdNid'
  suppEcsp:
    type: array
    items:
      $ref: '#/components/schemas/SupportedEcsp'
    minItems: 1
  pduConf:
    $ref: '#/components/schemas/PduConfiguration'

SupportedEcsp:
type: object
description: Represents the ECSPs information.
properties:
  ecspId:
    type: string
  easIds:
    type: array
    items:
      type: string
    minItems: 1
required:
- ecspId
- easIds

PduConfiguration:
type: object
description: Represents the PDU configuration information of the ECS.
properties:
  snssai:
    $ref: 'TS29571_CommonData.yaml#/components/schemas/Snssai'
  dnn:
    $ref: 'TS29571_CommonData.yaml#/components/schemas/Dnn'
required:
- snssai
- dnn

EcsInfoDiscNotif:
type: object
description: Represents the ECS Discovery notification information.
properties:
  ecsInfo:
    type: array
    items:
      $ref: '#/components/schemas/EcsInfo'
    minItems: 1
required:
- ecsInfo
```

Annex B (informative): Change history

Change history							
Date	Meeting	TDoc	CR	Rev	Cat	Subject/Comment	New version
2021-01	CT3#113e	C3-210300				TS skeleton for Enabling Edge Applications, Application Programming Interface (API) specification; Stage 3.	0.0.0
2021-01	CT3#113e	C3-210322				Inclusion of documents agreed in CT3#113e: C3-210182, C3-210301, C3-210321	0.1.0
2021-03	CT3#114e	C3-211508				Inclusion of documents agreed in CT3#114e: C3-211365, C3-211503, C3-211504, C3-211505, C3-211506, C3-211507	0.2.0
2021-04	CT3#115e	C3-212520				Inclusion of documents agreed in CT3#115e: C3-212367, C3-212368, C3-212369, C3-212370	0.3.0
2021-05	CT3#116e	C3-213328				Inclusion of documents agreed in CT3#116e: C3-213324, C3-213325, C3-213326, C3-213327, C3-213547	0.4.0
2021-08	CT3#117e	C3-214571				Inclusion of documents agreed in CT3#117e: C3-214387, C3-214513, C3-214389, C3-214570, C3-214388, C3-214390, C3-214391, C3-214392	0.5.0
2021-09	CT#93e	CP-212164				Version 1.0.0 created for presentation for information.	1.0.0
2021-10	CT3#118e	C3-215471				Inclusion of documents agreed in CT3#118e: C3-215236, C3-215338, C3-215339, C3-215340, C3-215341, C3-215342, C3-215377, C3-215378	1.1.0
2021-11	CT3#119e	C3-216515				Inclusion of documents agreed in CT3#119e: C3-216182, C3-216347, C3-216348, C3-216385, C3-216386, C3-216396	1.2.0
2022-01	CT3#119-Bis-e	C3-220447				Inclusion of documents agreed in CT3#119-Bis-e: C3-220133, C3-220419, C3-220420, C3-220421, C3-220459, C3-220275, C3-220276	1.3.0
2022-02	CT3#120e	C3-221510				Inclusion of documents agreed in CT3#120e: C3-221401, C3-221635, C3-221408, C3-221636, C3-221407, C3-221637, C3-221630, C3-221631, C3-221632, C3-221633, C3-221634, C3-221410, C3-221726, C3-221727, C3-221687	1.4.0
2022-04	CT3#121e	C3-222481				Inclusion of documents agreed in CT3#121e: C3-222136, C3-222137, C3-222139, C3-222141, C3-222143, C3-222362, C3-222363, C3-222364, C3-222409, C3-222410, C3-222411, C3-222449, C3-222508, C3-222576	1.5.0
2022-05	CT3#122e	C3-223504				Inclusion of documents agreed in CT3#122e: C3-223195, C3-223321, C3-223323, C3-223325, C3-223326, C3- 223327, C3-223331, C3-223334, C3-223336, C3-223337, C3- 223575, C3-223606, C3-223607, C3-223608, C3-223646, C3- 223647, C3-223648, C3-223649, C3-223650, C3-223675, C3- 223676, C3-223677, C3-223691, C3-223756, C3-223781, C3- 223792, C3-223793, C3-223794	1.6.0
2022-06	CT#96	CP-221100				Presentation to TSG CT for approval	2.0.0
2022-06	CT#96	CP-221100				Approved by TSG CT	17.0.0
2022-09	CT#97e	CP-222097	0001	1	F	Corrections to Eees_EASDiscovery_TeasDiscRequest operation	17.1.0
2022-09	CT#97e	CP-222097	0002	1	F	Add failure handling descriptions for EES services	17.1.0
2022-09	CT#97e	CP-222097	0003	1	F	Add failure handling descriptions for ECS services	17.1.0
2022-09	CT#97e	CP-222097	0004	1	F	Add redirect descriptions for EES services	17.1.0
2022-09	CT#97e	CP-222097	0005	1	F	Add redirect descriptions for ECS services	17.1.0
2022-09	CT#97e	CP-222097	0006	1	F	Corrections on ACRDataStatus and ACTResultInfo	17.1.0
2022-09	CT#97e	CP-222097	0007		F	Corrections on HTTP methods in EES services	17.1.0
2022-09	CT#97e	CP-222097	0008		F	Correction on OpenenAPI Eees_EECContextRelocation	17.1.0
2022-09	CT#97e	CP-222097	0009		F	Corrections on OpenAPI Eees_EELManagedACR	17.1.0
2022-09	CT#97e	CP-222098	0010	1	F	Corrections to EES APIs definition	17.1.0
2022-09	CT#97e	CP-222098	0011	1	F	Corrections to Eees_EELManagedACR API definition	17.1.0
2022-09	CT#97e	CP-222097	0012		F	Remove unused reference to OMA	17.1.0
2022-09	CT#97e	CP-222205	0014	1	F	Correcting the name of the data type related to availability status information	17.1.0
2022-09	CT#97e	CP-222206	0015	2	F	Clarifications to the "easId"	17.1.0
2022-09	CT#97e	CP-222098	0017	1	F	Corrections to user consent revocation management for the Eees_UELocation API	17.1.0
2022-09	CT#97e	CP-222121	0018		F	Update of info and externalDocs fields	17.1.0
2022-12	CT#98e	CP-223170	0020	1	F	Miscellaneous corrections in EES, ECS services	17.2.0
2022-12	CT#98e	CP-223170	0021	1	F	Correction in Eees_EECContextRelocation , Eees_EELManagedACR API	17.2.0
2022-12	CT#98e	CP-223170	0022	1	F	Correction in Eees_UeIdentifier, Eees_ACRManagementEvent API	17.2.0

2022-12	CT#98e	CP-223170	0023	1	F	Corrections on easId verification in update procedures in EES services	17.2.0
2022-12	CT#98e	CP-223170	0027	1	F	Correction on user consent procedure description	17.2.0
2022-12	CT#98e	CP-223170	0033	1	F	Editor's note resolution for Eees_UEIdentifier	17.2.0
2022-12	CT#98e	CP-223170	0034		F	Essential correction to Application Client Information	17.2.0
2022-12	CT#98e	CP-223170	0035		F	Correction on attribute name within EndPoint	17.2.0
2022-12	CT#98e	CP-223170	0036		F	Correction on request URI for Eees_EECContextRelocation_Push	17.2.0
2022-12	CT#98e	CP-223170	0037	1	F	Corrections on Location information report	17.2.0
2022-12	CT#98e	CP-223170	0039	1	F	Corrections on the Notification Destination URI	17.2.0
2022-12	CT#98e	CP-223170	0040	1	F	Corrections on the Revocation Notification URI	17.2.0
2022-12	CT#98e	CP-223170	0041	1	F	Missing supported features for Eees_UEIdentifier API	17.2.0
2022-12	CT#98e	CP-223170	0042	1	F	Corrections for data types of Eees_ACRManagementEvent service	17.2.0
2022-12	CT#98e	CP-223170	0043		F	Corrections for data types of Eees_SessionWithQoS service	17.2.0
2022-12	CT#98e	CP-223170	0044	1	F	Corrections on presence of the attribute in UserInformation data type	17.2.0
2022-12	CT#98e	CP-223188	0050		F	Update of info and externalDocs fields	17.2.0
2022-12	CT#98e	CP-223200	0024	1	F	Correction on easId verification in update procedure in ECS service	18.0.0
2022-12	CT#98e	CP-223200	0025	1	F	Correction on ACRManagementEvent_Subscribe service operation	18.0.0
2022-12	CT#98e	CP-223200	0026	1	F	Corrections on EES UE location information description	18.0.0
2022-12	CT#98e	CP-223198	0028		F	Remove duplicated description for EELManagedACR	18.0.0
2022-12	CT#98e	CP-223185	0029	1	F	Adding operationId and tags fields	18.0.0
2022-12	CT#98e	CP-223185	0030	1	F	Eees_ACRManagementEvent and Eees_ACRStatusUpdate APIs: enumeration definitions	18.0.0
2022-12	CT#98e	CP-223185	0031	1	F	Corrections on the description of PUT and PATCH	18.0.0
2022-12	CT#98e	CP-223199	0038	1	F	Corrections on the apiNames	18.0.0
2022-12	CT#98e	CP-223185	0045	1	F	Add the missing description fields of some attributes in the OpenAPI file	18.0.0
2022-12	CT#98e	CP-223190	0051		F	Update of info and externalDocs fields	18.0.0
2023-03	CT#99	CP-230156	0055	1	B	Updates on location reporting in Eees_UELocation API	18.1.0
2023-03	CT#99	CP-230156	0056	1	F	Correction of the description fields in enumerations	18.1.0
2023-03	CT#99	CP-230169	0057	1	B	Seamless service continuity support for transport layer in the EAS	18.1.0
2023-03	CT#99	CP-230138	0060	1	A	Corrections to the EAS Type definition	18.1.0
2023-03	CT#99	CP-230139	0061	1	B	EAS profile update with general context holding time	18.1.0
2023-03	CT#99	CP-230162	0063		F	Update of info and externalDocs fields	18.1.0
2023-06	CT#100	CP-231139	0064	1	F	Updates to the EAS type for UAS services	18.2.0
2023-06	CT#100	CP-231185	0065	1	B	Completing the support of the seamless transport layer service continuity functionality	18.2.0
2023-06	CT#100	CP-231144	0068	3	B	ACR scenario re-selection after successful ACR	18.2.0
2023-06	CT#100	CP-231310	0069	2	B	ACR Selection event and update ACR start stop event	18.2.0
2023-06	CT#100	CP-231144	0070	1	B	EEC context update with UE mobility requirement	18.2.0
2023-06	CT#100	CP-231237	0071	4	B	Update EES Profile with Instantiable EAS information	18.2.0
2023-06	CT#100	CP-231144	0072	1	B	Completion of the definition of the general context holding time duration	18.2.0
2023-06	CT#100	CP-231321	0073	3	B	Defining the EAS bundle information	18.2.0
2023-06	CT#100	CP-231328	0075	2	B	Enhancements to ACR management events	18.2.0
2023-06	CT#100	CP-231144	0076	1	B	Exposure of EAS service APIs via CAPIF	18.2.0
2023-06	CT#100	CP-231144	0077		B	Support for federation and roaming	18.2.0
2023-06	CT#100	CP-231312	0078	2	B	Updates to Eees_ACRManagementEvent API	18.2.0
2023-06	CT#100	CP-231144	0079	1	B	Updates to Eees_SessionWithQoS API	18.2.0
2023-06	CT#100	CP-231144	0080		B	Supporting SNPN for the EES Topological Service Area	18.2.0
2023-06	CT#100	CP-231153	0084	1	A	Correction to EndPoint	18.2.0
2023-06	CT#100	CP-231153	0086		A	Correct data type in Eees_EASRegistration API	18.2.0
2023-06	CT#100	CP-231144	0088	1	B	Add consumer for Eees_UEIdentifier and support EDGE-10	18.2.0
2023-06	CT#100	CP-231139	0090		F	Corrections on certain terminology	18.2.0
2023-06	CT#100	CP-231139	0091		F	Corrections on supported feature in EDGEAPP APIs	18.2.0
2023-06	CT#100	CP-231144	0093	1	B	Definition of the service description clauses of the Eees_ACRParameterInformation API	18.2.0
2023-06	CT#100	CP-231144	0094	1	B	Definition of the API clauses of the Eees_ACRParameterInformation API	18.2.0
2023-06	CT#100	CP-231144	0095	1	B	Definition of the OpenAPI description of the Eees_ACRParameterInformation API	18.2.0
2023-06	CT#100	CP-231320	0097	1	A	Corrections to the ACT start/stop event related information	18.2.0
2023-06	CT#100	CP-231134	0098	1	D	Clarifications to the EAS ID definition	18.2.0
2023-06	CT#100	CP-231141	0100		F	Update of info and externalDocs fields	18.2.0
2023-09	CT#101	CP-232089	0101	1	B	Service continuity support related updates Eecs_TargetEESDiscovery_Request service operation	18.3.0
2023-09	CT#101	CP-232089	0102	1	B	Composite EAS support related updates	18.3.0
2023-09	CT#101	CP-232089	0103	1	B	Resolving the SelectedACRScenarios data type Editor's Notes	18.3.0
2023-09	CT#101	CP-232089	0104		B	Supporting the indication of service continuity planning	18.3.0
2023-09	CT#101	CP-232089	0105	1	F	Corrections to the definition of the Eees_ACRParameterInformation API	18.3.0
2023-09	CT#101	CP-232089	0106		F	Instantiable EAS information related updates	18.3.0

2023-09	CT#101	CP-232089	0107	1	B	Selected EES declaration service descriptions and procedures	18.3.0
2023-09	CT#101	CP-232089	0108	1	B	Selected EES declaration service API Definitions	18.3.0
2023-09	CT#101	CP-232254	0109	2	B	Selected EES declaration service OpenAPI file definitions	18.3.0
2023-09	CT#101	CP-232089	0113	1	B	Update the Eecs_TargetEESDiscovery to support ECI-3	18.3.0
2023-09	CT#101	CP-232253	0114	2	B	Update the Eecs_TargetEESDiscovery API to support ENS	18.3.0
2023-09	CT#101	CP-232089	0115	1	B	Update the Eees_EASDiscovery_TEasDiscRequest to support EAS synchronization	18.3.0
2023-09	CT#101	CP-232089	0116	1	B	Update to ACR parameter information procedure to support ECI-4	18.3.0
2023-09	CT#101	CP-232089	0117	1	B	Update to EEC context relocation to support ECI-4	18.3.0
2023-09	CT#101	CP-232089	0118		B	Common EAS announcement	18.3.0
2023-09	CT#101	CP-232085	0121		F	Update of info and externalDocs fields	18.3.0
2023-12	CT#102	CP-233241	0089	5	B	Updates to Eees_UEIdentifier API	18.4.0
2023-12	CT#102	CP-233241	0122		B	Remove the remaining Editor's Note on EAS bundle requirements	18.4.0
2023-12	CT#102	CP-233241	0123		B	Remove the remaining Editor's Note on the ACRScenario data type	18.4.0
2023-12	CT#102	CP-233241	0124	3	B	Remove the remaining Editor's Notes on the "servContPlanInd" attribute	18.4.0
2023-12	CT#102	CP-233241	0125		B	Remove the remaining Editor's Note on the "aclds" attribute	18.4.0
2023-12	CT#102	CP-233241	0126	2	B	Complete the definition of the ACR Selection event	18.4.0
2023-12	CT#102	CP-233241	0127		B	Resolve the remaining Editor's Note on the "teasEndPoint" attribute	18.4.0
2023-12	CT#102	CP-233273	0129	1	A	Corrections to boolean type definitions	18.4.0
2023-12	CT#102	CP-233241	0130	1	B	ACR Management subscription API update	18.4.0
2023-12	CT#102	CP-233241	0132	1	B	ACRManagementEvent - EAS ack and service continuity	18.4.0
2023-12	CT#102	CP-233241	0133	1	B	Updates to Common EAS Announcement service	18.4.0
2023-12	CT#102	CP-233241	0134	1	B	Eees_EASRegistration - EAS sync and Bundle updates	18.4.0
2023-12	CT#102	CP-233241	0136	1	B	Retrieve EES using application group identifier	18.4.0
2023-12	CT#102	CP-233287	0138	1	F	SEALDD feature related updates	18.4.0
2023-12	CT#102	CP-233241	0139	1	B	Corrections and updates to the EAS bundle information	18.4.0
2023-12	CT#102	CP-233241	0140	1	B	Adding EDN information to the EES profile	18.4.0
2023-12	CT#102	CP-233241	0141	1	B	Support indicating the EAS ability of handling bundled EAS ACR	18.4.0
2023-12	CT#102	CP-233241	0142		F	Corrections to the definition of the general context holding time duration	18.4.0
2023-12	CT#102	CP-233241	0143	1	B	Resolve ENs in Eees_ACRManagementEvent API	18.4.0
2023-12	CT#102	CP-233241	0144	1	B	Resolve ENs in Eees_SessionWithQoS API	18.4.0
2023-12	CT#102	CP-233242	0145	1	B	Update ACR management event notification	18.4.0
2023-12	CT#102	CP-233231	0146		F	Miscellaneous Corrections	18.4.0
2023-12	CT#102	CP-233241	0147	1	B	Instantiation criteria update and add missing abbreviations	18.4.0
2023-12	CT#102	CP-233237	0149		F	Update of info and externalDocs fields	18.4.0
2024-03	CT#103	CP-240168	0110	5	B	EAS Information Management service descriptions and procedures	18.5.0
2024-03	CT#103	CP-240168	0111	5	B	EAS Information Management service API Definitions	18.5.0
2024-03	CT#103	CP-240168	0112	3	B	EAS Information Management service OpenAPI Definitions	18.5.0
2024-03	CT#103	CP-240168	0150	1	B	Updates to EAS ID in ACR management event notification	18.5.0
2024-03	CT#103	CP-240168	0151	1	B	Resolve EN for interworking with cloud services	18.5.0
2024-03	CT#103	CP-240168	0153	1	B	Complete the definition of the Eees_CommonEASAnnouncement API	18.5.0
2024-03	CT#103	CP-240168	0154		B	Complete the definition of the new ACR Selection event and the updates to the ACT Start/Stop event	18.5.0
2024-03	CT#103	CP-240168	0155	2	B	Updates to the support of the cloud entities and services	18.5.0
2024-03	CT#103	CP-240168	0156	1	B	Application Port ID for Eees_UEIdentifier API	18.5.0
2024-03	CT#103	CP-240168	0157	1	F	Correction for Eees_UEIdentifier API	18.5.0
2024-03	CT#103	CP-240168	0158	1	F	Correction for the typo	18.5.0
2024-03	CT#103	CP-240168	0159	1	B	Trigger parameters for Eees_AppClientInformation API	18.5.0
2024-03	CT#103	CP-240168	0160	4	B	Application traffic influence trigger from EAS	18.5.0
2024-03	CT#103	CP-240168	0161	1	F	Corrections to Eees_UEIdentifier API	18.5.0
2024-03	CT#103	CP-240168	0162	1	F	CAS decided ACR for CESless case	18.5.0
2024-03	CT#103	CP-240168	0163	1	F	AC information exposure updates	18.5.0
2024-03	CT#103	CP-240168	0164	1	F	Miscellaneous alignments	18.5.0
2024-03	CT#103	CP-240197	0166	1	A	Correction to incorrect attribute name capitalization	18.5.0
2024-03	CT#103	CP-240173	0167	1	F	Corrections to ConsentRevoked	18.5.0
2024-03	CT#103	CP-240166	0168		F	Update of info and externalDocs fields	18.5.0
2024-06	CT#104	CP-241106	0119	7	B	ECS Registration and Deregistration	18.6.0
2024-06	CT#104	CP-241256	0120	10	B	ECS Discovery	18.6.0
2024-06	CT#104	CP-241106	0152	4	B	Definition of Eecs_ECSServiceProvisioning service API	18.6.0
2024-06	CT#104	CP-241083	0169		F	Several OpenAPI Corrections	18.6.0
2024-06	CT#104	CP-241084	0170	1	B	Complete the definition of the EAS ID and EAS type to support application layer frameworks deployment	18.6.0
2024-06	CT#104	CP-241083	0171	1	B	Updates to the definition of the IndividualSessionContext data type	18.6.0
2024-06	CT#104	CP-241106	0172		F	Various corrections to the definition of the Eees_TrafficInfluenceEAS API	18.6.0
2024-06	CT#104	CP-241106	0174	1	F	Update to CES re-used service APIs	18.6.0
2024-06	CT#104	CP-241106	0176	1	B	Updates to EAS Profile	18.6.0
2024-06	CT#104	CP-241106	0178	1	B	Updates to EAS synchronization	18.6.0
2024-06	CT#104	CP-241135	0179	1	A	Correction in Eees_UELocation API	18.6.0

2024-06	CT#104	CP-241084	0180	1	F	Correction on P and Cardinality column in the Data type	18.6.0
2024-06	CT#104	CP-241084	0182	1	F	Error in redirection handling of UE Identifier request message	18.6.0
2024-06	CT#104	CP-241106	0183	2	F	Various essential corrections	18.6.0
2024-06	CT#104	CP-241084	0184	1	B	Updates error handling in Eees_UeIdentifier API	18.6.0
2024-06	CT#104	CP-241106	0185	1	B	Updates to Eees_TrafficInfluenceEAS service	18.6.0
2024-06	CT#104	CP-241106	0186		F	Correction of data type of ProblemDetailsEIMExt	18.6.0
2024-06	CT#104	CP-241086	0188		F	Update of info and externalDocs fields	18.6.0
2024-09	CT#105	CP-242161	0208	1	F	Various updates and corrections	18.7.0
2024-09	CT#105	CP-242120	0220		F	Update of info and externalDocs fields	18.7.0
2024-12	CT#106	CP-243109	0227		F	Corrections on the federation agreements related information	18.8.0
2024-12	CT#106	CP-243126	0250		A	Corrections on the AC Filters	18.8.0
2024-12	CT#106	CP-243109	0252		F	Corrections on the end point	18.8.0
2024-12	CT#106	CP-243109	0254		F	Corrections on the UE Id	18.8.0
2024-12	CT#106	CP-243146	0260		F	Update of info and externalDocs fields	18.8.0
2025-03	CT#107	CP-250128	0271		F	Update of info and externalDocs fields	18.9.0
2025-06	CT#108	CP-251230	0280		F	Update of info and externalDocs fields	18.10.0
2026-03	CT#111	CP-260080	0292		F	Update of info and externalDocs fields	18.11.0

History

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