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Multi-access Edge Computing (MEC); UE Identity API

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Reference

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Foreword

This Group Specification (GS) has been produced by ETSI Industry Specification Group (ISG) Multi-access Edge Computing (MEC).

Modal verbs terminology

In the present document "**shall**", "**shall not**", "**should**", "**should not**", "**may**", "**need not**", "**will**", "**will not**", "**can**" and "**cannot**" are to be interpreted as described in clause 3.2 of the [ETSI Drafting Rules](#) (Verbal forms for the expression of provisions).

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1 Scope

The present document focuses on the UE Identity functionality. It describes the related application policy information (including authorization, access control and traffic rule pattern format), information flows, required information and service aggregation patterns. The present document specifies the necessary API, data model and data format, considering existing API(s) if applicable.

2 References

2.1 Normative references

References are either specific (identified by date of publication and/or edition number or version number) or non-specific. For specific references, only the cited version applies. For non-specific references, the latest version of the referenced document (including any amendments) applies.

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NOTE: While any hyperlinks included in this clause were valid at the time of publication, ETSI cannot guarantee their long term validity.

The following referenced documents are necessary for the application of the present document.

- [1] Void.
- [2] ETSI GS MEC 002: "Multi-access Edge Computing (MEC); Phase 2: Use Cases and Requirements".
- [3] ETSI GS MEC 009: "Multi-access Edge Computing (MEC); General principles, patterns and common aspects of MEC Service APIs".
- [4] ETSI GS MEC 011: "Multi-access Edge Computing (MEC); Edge Platform Application Enablement".
- [5] IETF RFC 5246: "The Transport Layer Security (TLS) Protocol Version 1.2".

NOTE 1: Available at <https://tools.ietf.org/html/rfc5246>.

NOTE 2: Obsoleted by IETF RFC 8446.

- [6] IETF RFC 8446: "The Transport Layer Security (TLS) Protocol Version 1.3".

NOTE: Available at <https://tools.ietf.org/html/rfc8446>.

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

NOTE: Available at <https://tools.ietf.org/html/rfc6749>.

- [8] IETF RFC 6750: "The OAuth 2.0 Authorization Framework: Bearer Token Usage".

NOTE: Available at <https://tools.ietf.org/html/rfc6750>.

2.2 Informative references

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The following referenced documents are not necessary for the application of the present document but they assist the user with regard to a particular subject area.

[i.1] OpenAPI Specification.

NOTE: Available at <https://github.com/OAI/OpenAPI-Specification>.

[i.2] ETSI GS MEC 001: "Multi-access Edge Computing (MEC); Terminology".

3 Definition of terms, symbols and abbreviations

3.1 Terms

For the purposes of the present document, the terms given in ETSI GS MEC 001 [i.2] apply.

3.2 Symbols

Void.

3.3 Abbreviations

For the purposes of the present document, the abbreviations given in ETSI GS MEC 001 [i.2] and the following apply:

API	Application Programming Interface
HTTP	Hypertext Transfer Protocol
IETF	Internet Engineering Task Force
JSON	JavaScript Object Notation
TLS	Transport Layer Security
UE	User Equipment
URI	Uniform Resource Indicator or Uniform Resource Identifier or Universal Resource Identifier

4 Overview

The present document specifies the API for the UE Identity feature to support the corresponding requirements defined for the Multi-access Edge Computing in ETSI GS MEC 002 [2].

Clause 5 contains the description of the feature and the information flows of the procedures. Clause 6 describes the data model and data format applied in the UE Identity API. Clause 7 is the actual API definition of the UE Identity feature.

5 Description of the feature (informative)

5.1 Introduction

The purpose of the UE Identity feature is to allow UE specific traffic rules in the MEC system.

When the MEC system supports the UE Identity feature, the MEC platform provides the functionality for a MEC application to register a tag (representing a UE) or a list of tags. Each tag has been mapped into a specific UE in the mobile network operator's system. The MEC platform is provided with the mapping information. How the mapping is realized is outside the scope of the present document. The UE Identity tag registration triggers the MEC platform to activate the corresponding traffic rule(s) linked to the tag. Later, if the application does not wish to use the traffic rule for that user, it may de-register the UE Identity tag by invoking the de-registration procedure.

5.2 Sequence diagrams

5.2.1 General

The following clauses describe how MEC applications can register and de-register tags as part of UE Identity feature. The related sequence diagrams are presented.

5.2.2 UE Identity tag registration

Figure 5.2.2-1 illustrates the message flow for the UE Identity tag registration procedure. The tag is used in UE Identity feature.

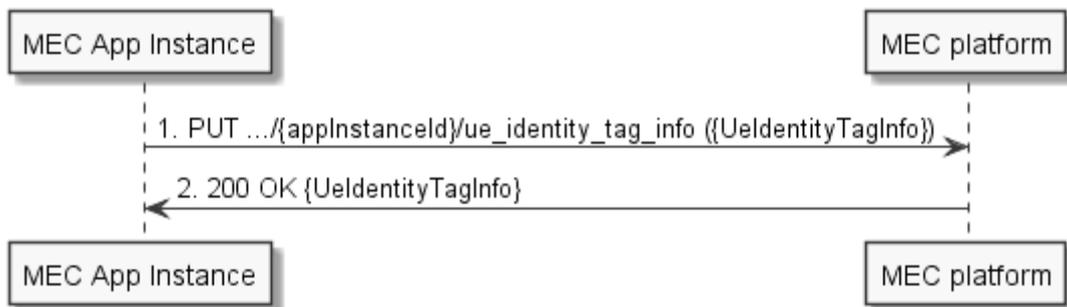


Figure 5.2.2-1: UE Identity tag registration

The UE Identity tag registration procedure consists of the following steps:

- 1) The MEC application instance sends a PUT request with the message body containing the UeIdentityTagInfo data structure with the state set to REGISTERED to the MEC platform. The variable {appInstanceId} is set to the application instance identifier assigned to the MEC application instance.
- 2) The MEC platform sends "200 OK" response with the message body containing the UeIdentityTagInfo data structure with the state set to REGISTERED.

Once the tag or the list of tags, is successfully registered in the MEC platform the related traffic rules can then be activated.

NOTE: It is out of the scope of the present document how the MEC application obtains the UE Identity tag(s).

5.2.3 UE Identity tag de-registration

Figure 5.2.3-1 illustrates the message flow for the UE Identity tag deregistration procedure.

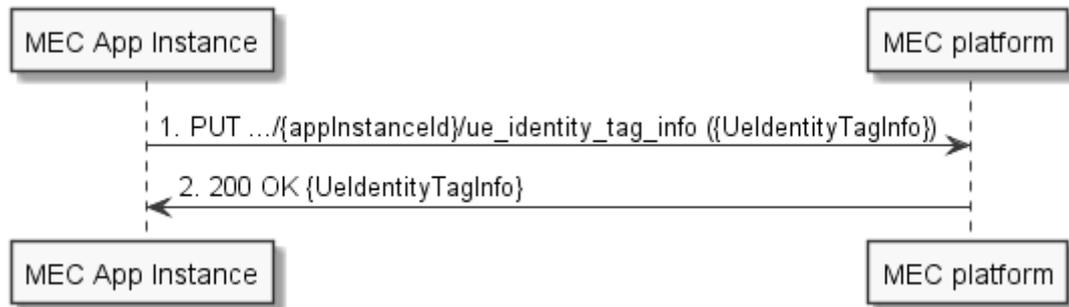


Figure 5.2.3-1: UE Identity tag de-registration

The UE Identity tag deregistration procedure consists of the following steps:

- 1) The MEC application instance sends a PUT request with the message body containing the UeIdentityTagInfo data structure with the state set to UNREGISTERED to the MEC platform. The variable {appInstanceId} is set to the application instance identifier assigned to the MEC application instance.
- 2) The MEC platform sends "200 OK" response with the message body containing the UeIdentityTagInfo data structure with the state set to UNREGISTERED.

Once the tag or the list of tags is successfully deregistered in the MEC platform the related traffic rules are then deactivated.

6 Data model & Data format (normative)

6.1 Introduction

The following clauses specify the data types that are used to implement the UE Identity feature, for which the relevant sequence diagrams are described in clauses 5.2.2 and 5.2.3.

6.2 Resource data types

6.2.1 Introduction

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

6.2.2 Type: UeIdentityTagInfo

This type represents the information of UE Identity tag used in the UE Identity feature.

Table 6.2.2-1: Definition of type UeIdentityTagInfo

Attribute name	Data type	Cardinality	Description
ueIdentityTags	Structure (inlined)	1..N	1 to N tags presented by a MEC Application instance to a MEC Platform
>ueIdentityTag	String	1	Specific tag presented by a MEC Application instance to a MEC Platform
>state	Enum (inlined)	1	The following numeric values are defined: 0 = UNREGISTERED 1 = REGISTERED

6.3 Subscription types

In the present document, no subscription data types are defined.

6.4 Notifications types

In the present document, no notifications data types are defined.

6.5 Referenced structured data types

In the present document, no referenced structured data types are defined.

6.6 Referenced simple data types

In the present document, no referenced simple data types are defined.

7 API definition (normative)

7.1 Introduction

This clause defines the resources and operations of the UE identity API.

7.2 Global definitions and resource structure

All resource URIs of this API shall have the following root:

`{apiRoot}/{apiName}/{apiVersion}/`

The "apiRoot" is discovered using the service registry. The "apiName" shall be set to "ui" and the "apiVersion" shall be set to "v1" for the present document. It includes the scheme ("https"), host and optional port, and an optional prefix string. The API shall support HTTP over TLS (also known as HTTPS) using TLS version 1.2 (as defined by IETF RFC 5246 [5]). TLS 1.3 (including the new specific requirements for TLS 1.2 implementation) defined by IETF RFC 8446 [6] should be supported. HTTP without TLS shall not be used. Versions of TLS earlier than 1.2 shall neither be supported nor used. All resource URIs in the clauses below are defined relative to the above root URI.

The content format JSON shall be supported.

The JSON format is signalled by the content type "application/json".

This API shall require the use of the OAuth 2.0 client credentials grant type according to IETF RFC 6749 [7] with bearer tokens according to IETF RFC 6750 [8]. See clause 6.16 of ETSI GS MEC 009 [3] for more information. The token endpoint can be discovered as part of the service availability query procedure defined in ETSI GS MEC 011 [4]. How the client credentials are provisioned into the MEC application is out of scope of the present document.

This API supports additional application-related error information to be provided in the HTTP response when an error occurs. See clause 6.15 of ETSI GS MEC 009 [3] for more information.

Figure 7.2-1 illustrates the resource URI structure of this API.

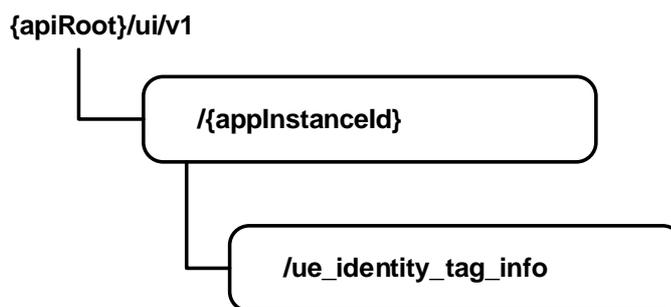


Figure 7.2-1: Resource URI structure of the UE Identity API

Table 7.2-1 provides an overview of the resources defined by the present document, and the applicable HTTP methods.

Table 7.2-1: Resources and methods overview

Resource name	Resource URI	HTTP method	Meaning
Individual UeIdentityTagInfo	.../{applInstanceid}/ue_identity_tag_info	GET	Retrieve information about specific UeIdentityTagInfo
		PUT	Register/De-register the information about specific UeIdentityTagInfo

7.3 Resource: individual UeIdentityTagInfo

7.3.1 Description

This resource is used to represent the information of a single UE Identity tag resource, which follows the resource data type of "UeIdentityTagInfo" as specified in clause 6.2.2.

7.3.2 Resource definition

Resource URI: {apiRoot}/ui/v1/{appInstanceId}/ue_identity_tag_info

Resource URI Variables for this resource are defined in table 7.3.2-1.

Table 7.3.2-1: Resource URI Variables for resource "individual UeIdentityTagInfo"

Name	Definition
apiRoot	See clause 7.2
appInstanceId	Represents a MEC application instance

7.3.3 Resource Methods

7.3.3.1 GET

This method retrieves information about a UeIdentityTagInfo resource.

This method shall comply with the URI query parameters, request and response data structures, and response codes, as specified in the tables 7.3.3.1-1 and 7.3.3.1-2.

Table 7.3.3.1-1: URI query parameters supported by the GET method on this resource

Name	Data type	Cardinality	Remarks
ueidentityTag	String	1..N	Represents one or more UEs

Table 7.3.3.1-2: Data structures supported by the GET request/response on this resource

Request body	Data type	Cardinality	Remarks	
n/a				
Response body	Data type	Cardinality	Response codes	Remarks
	UeIdentityTagInfo	1	200 OK	It is used to indicate nonspecific success. The response body contains a representation of the UeIdentityTagInfo resource.
	ProblemDetails	0..1	400 Bad Request	It is used to indicate that incorrect parameters were passed to the request. In the returned ProblemDetails structure, the "detail" attribute should convey more information about the error.
	ProblemDetails	0..1	404 Not Found	It is used when a client provided a URI that cannot be mapped to a valid resource URI. In the returned ProblemDetails structure, the "detail" attribute should convey more information about the error.
	ProblemDetails	1	403 Forbidden	The operation is not allowed given the current status of the resource. More information shall be provided in the "detail" attribute of the "ProblemDetails" structure.

7.3.3.2 PUT

This method registers/deregisters one or more UE Identity tags. It has "replace" semantics.

This method is typically used in "UE Identity tag registration" procedure as described in clause 5.2.2 and "UE Identity tag de-registration" procedure as described in clause 5.2.3.

This method shall comply with the URI query parameters, request and response data structures, and response codes, as specified in the tables 7.3.3.2-1 and 7.3.3.2-2.

Table 7.3.3.2-1: URI query parameters supported by the PUT method on this resource

Name	Data type	Cardinality	Remarks
n/a			

Table 7.3.3.2-2: Data structures supported by the PUT request/response on this resource

Request body	Data type	Cardinality	Remarks	
	UeIdentityTagInfo	1	The updated "state" for each included UE Identity tag is included in the entity body of the request.	
Response body	Data type	Cardinality	Response codes	Remarks
	UeIdentityTagInfo	1	200 OK	It is used to indicate success. The response body contains a representation of the UeIdentityTagInfo resource.
	ProblemDetails	0..1	400 Bad Request	It is used to indicate that incorrect parameters were passed to the request. In the returned ProblemDetails structure, the "detail" attribute should convey more information about the error.
	ProblemDetails	0..1	404 Not Found	It is used when a client provided a URI that cannot be mapped to a valid resource URI. In the returned ProblemDetails structure, the "detail" attribute should convey more information about the error.
	ProblemDetails	1	403 Forbidden	The operation is not allowed given the current status of the resource. More information shall be provided in the "detail" attribute of the "ProblemDetails" structure.
	ProblemDetails	0..1	412 Precondition Failed	It is used when a condition has failed during conditional requests, e.g. when using ETags to avoid write conflicts. In the returned ProblemDetails structure, the "detail" attribute should convey more information about the error.

7.3.3.3 PATCH

Not supported.

7.3.3.4 POST

Not supported.

7.3.3.5 DELETE

Not supported.

Annex A (informative): Complementary material for API utilization

To complement the definitions for each method and resource defined in the interface clauses of the present document, ETSI MEC ISG is providing for the *UE identity* API a supplementary description file compliant to the OpenAPI Specification [i.1].

In case of discrepancies between the supplementary description file and the related data structure definitions in the present document, the data structure definitions take precedence.

The supplementary description file, relating to the present document, is located at:

- <https://forge.etsi.org/rep/mec/gs014-ue-identity-api>.

History

Document history		
V1.1.1	February 2018	Publication
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