



Multi-access Edge Computing (MEC); Device application interface

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ETSI

650 Route des Lucioles
F-06921 Sophia Antipolis Cedex - FRANCE

Tel.: +33 4 92 94 42 00 - Fax: +33 4 93 65 47 16

Siret N° 348 623 562 00017 - NAF 742 C
Association à but non lucratif enregistrée à la
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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

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1 Scope

The present document contains the API definition for the lifecycle management of user applications over the Mx2 reference point between the device application and the User Application LifeCycle Management Proxy (UALCMP) in the MEC system.

The present document covers the following lifecycle management operations: user application look-up, instantiation and termination. In addition, a mechanism is specified for the exchange of lifecycle management related information between the MEC system and the device application.

The intended key audience of the present document are the application developers for the MEC system, since this API provides them with a method to manage their applications.

NOTE: User application mobility related lifecycle management operations are not covered by the present document.

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.

Referenced documents which are not found to be publicly available in the expected location might be found at <https://docbox.etsi.org/Reference/>.

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

[1] ETSI GS MEC 010-2: "Multi-access Edge Computing (MEC); MEC Management; Part 2: Application lifecycle, rules and requirements management".

[2] IETF RFC 2818: "HTTP Over TLS".

NOTE: Available at <https://tools.ietf.org/html/rfc2818>.

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

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

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

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

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

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

[6] IETF RFC 4776: "Dynamic Host Configuration Protocol (DHCPv4 and DHCPv6) Option for Civic Addresses Configuration Information".

NOTE: Available at <https://tools.ietf.org/html/rfc4776>.

[7] ISO 3166: "Codes for the representation of names of countries and their subdivisions".

[8] IETF RFC 7946: "The GeoJSON Format".

NOTE: Available at <https://tools.ietf.org/html/rfc7946>.

2.2 Informative references

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

- [i.1] ETSI GS MEC 001: "Multi-access Edge Computing (MEC); Terminology".
- [i.2] ETSI GS MEC 002: "Multi-access Edge Computing (MEC); Phase 2: Use Cases and Requirements".
- [i.3] OpenAPI™ Specification.

NOTE 1: Available at <https://github.com/OAI/OpenAPI-Specification>.

NOTE 2: OpenAPI Specification and OpenAPI Initiative and their respective logos, are trademarks of the Linux Foundation.

- [i.4] ETSI GS MEC 009: "Multi-access Edge Computing (MEC); General principles for MEC Service APIs".

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.1] and the following apply:

user application lifecycle management proxy: system level functional element that allows specific and authorized requests from the device application for the user application lifecycle management

3.2 Symbols

Void.

3.3 Abbreviations

For the purposes of the present document, the abbreviations given in ETSI GS MEC 001 [i.1] and the following apply:

AA	Authentication and Authorization
API	Application Programming Interface
OSS	Operations Support System
TLS	Transport Layer Security
UALCMP	User Application LifeCycle Management Proxy
URI	Uniform Resource Identifier

4 Overview

The present document specifies the API for the Mx2 reference point to support the corresponding requirements defined for the Multi-access Edge Computing in ETSI GS MEC 002 [i.2].

Clause 5 describes how the API can be used by the device application and by the MEC system. It describes the information flows for the procedures over the Mx2 reference point.

The information that is exchanged over the Mx2 reference point is described in clause 6, providing detailed description of all information elements available on that interface.

Clause 7 describes the actual API, providing detailed information how the information elements map into the RESTful API design of the interface.

Clause 8 describes the authentication, authorization and access control for the API.

5 Description of the service (informative)

5.1 Sequence diagrams

5.1.1 Introduction

The following clauses describe how the device application interacts with the UALCMP over the Mx2 reference point. The sequence diagrams that are relevant for the API are presented.

The device application presents the access token to the UALCMP with every request in order to assert that it is allowed to access the resource with the particular method it invokes. The access token is included in the "Authorization" request header field as a bearer token according to IETF RFC 6750 [5].

5.1.2 User application look-up

The user application look-up is the procedure for requesting the list of available user applications in the MEC system to the requesting device application. The user application look-up procedure is illustrated in figure 5.1.2-1.

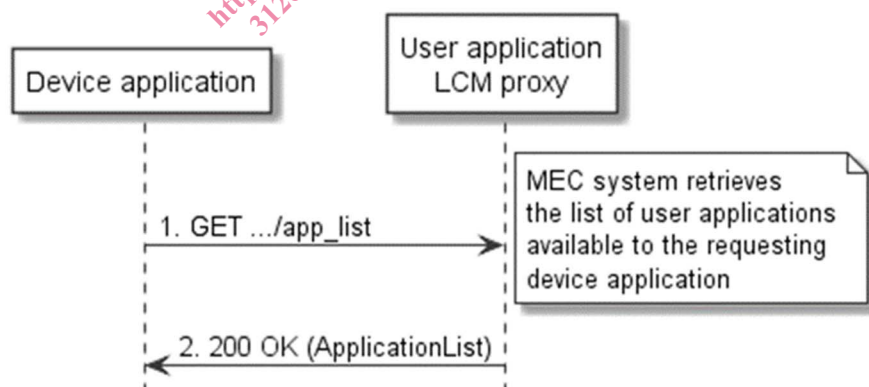


Figure 5.1.2-1: User application look-up

- 1) The device application submits the GET request to the UALCMP. The UALCMP authorizes the request from device application. The MEC system retrieves the list of user applications available to the requesting device application.
- 2) The UALCMP returns the 200 OK response to the device application, with the message body containing the data structure for the list of available user applications.

5.1.3 Application context create

The application context create is the procedure to request either to join with an available user application or to instantiate a new user application. The application context create procedure is illustrated in figure 5.1.3-1.

As part of the user application instantiation, the MEC system will create an associated application context that the MEC system maintains for the lifetime of the user application. The application context contains information specific to the instance(s) of the user application such as unique identifiers within the MEC system and the address(es) (URI) provided for clients that are external to the MEC system to interact with the user application.

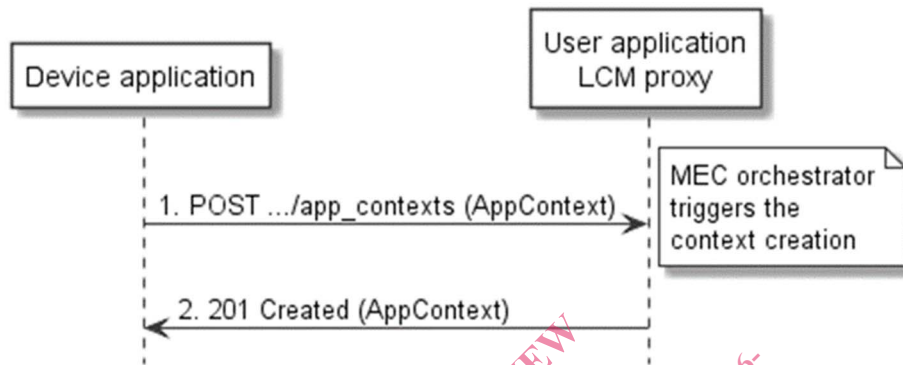


Figure 5.1.3-1: Application context create

- 1) The device application submits the POST request to the UALCMP. The message body contains the data structure for the application context to be created.
- 2) The UALCMP authorizes the request from the device application. The request is forwarded to the OSS. The OSS makes the decision on granting the context creation request. The MEC orchestrator triggers the creation of the application context in the MEC system.
- 3) The UALCMP returns the 201 Created response to the device application with the message body containing the data structure of the created application context, which includes the address(es) (reference URIs) provided for clients that are external to the MEC system to interact with the user application. The response message header contains the address of the resource relating to the application instance context created and maintained by the MEC system.

5.1.4 Application context delete

The application context delete is a procedure in which the device application requests the deletion of the application context. The application context delete procedure is illustrated in figure 5.1.4-1.

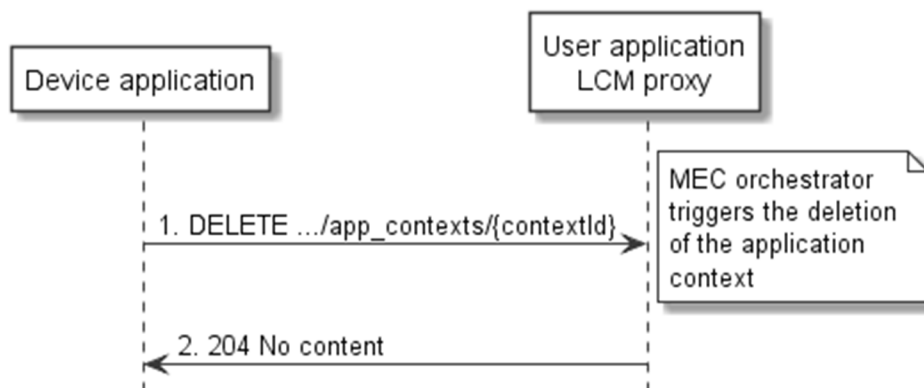


Figure 5.1.4-1: Application context delete

- 1) The device application submits the DELETE request to the UALCMP for the application context to be deleted.
- 2) The UALCMP authorizes the request from device application. The request is forwarded to the OSS. The OSS makes the decision on granting the deletion. The MEC orchestrator triggers the deletion of the application context, including deletion of the resource maintained by the MEC system that represents it.
- 3) The UALCMP returns "204 No content" response.

5.1.5 Application context update

The UALCMP is provided with an update of the application context. The procedure is illustrated in figure 5.1.5-1.

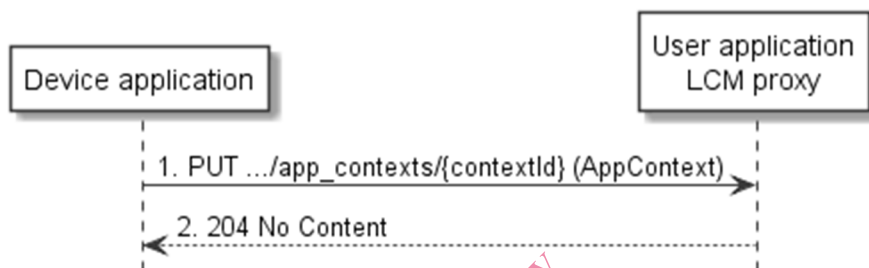


Figure 5.1.5-1: Application context update

- 1) The device application updates a specific application context by sending a PUT request to the resource within the MEC system that represents it, with the message body containing the modified data structure of AppContext in which only the callback reference and/or application location constraints, may be updated.
- 2) The UALCMP returns a "204 No Content" response.

5.1.6 Receiving notification events

Figure 5.1.6-1 presents the scenario where the UALCMP sends notification events to the device application.

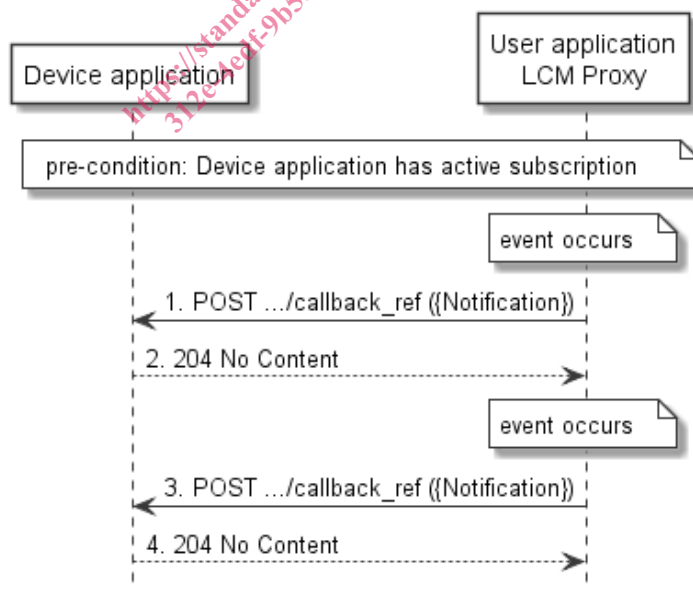


Figure 5.1.6-1: Flow of receiving notification events