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Multi-access Edge Computing (MEC);

Traffic Management APIs

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**Group Specification**

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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](https://portal.etsi.org/Services/editHelp!/Howtostart/ETSIDraftingRules.aspx) (Verbal forms for the expression of provisions).

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# 1 Scope

The present document focuses on the Traffic Management multi-access edge service. It describes the related application policy information including authorization and access control, information flows, required information and service aggregation patterns. The present document specifies the necessary API with the data model and data format.

# 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>.

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] Void.

[3] IETF RFC 5246: "The Transport Layer Security (TLS) Protocol Version 1.2".

NOTE: Available at <https://www.rfc-editor.org/info/rfc5246>.

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

NOTE: Available at <https://www.rfc-editor.org/info/rfc6749>.

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

NOTE: Available at <https://www.rfc-editor.org/info/rfc6750>.

[6] ETSI GS MEC 009: "Multi-access Edge Computing (MEC); General principles, patterns and common aspects of MEC Service APIs".

[7] IETF RFC 7396: "JSON Merge Patch".

NOTE: Available at <https://www.rfc-editor.org/info/rfc7396>.

[8] IEEE 802.11™-2016: "IEEE Standard for Information technology-Telecommunications and information exchange between systems Local and metropolitan area networks-Specific requirements - Part 11: Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) Specifications".

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

NOTE: Available at <https://www.rfc-editor.org/info/rfc8446>.

[10] IETF RFC 1166: "Internet Numbers".

NOTE: Available at <https://www.rfc-editor.org/info/rfc1166>.

[11] IETF RFC 5952: "A recommendation for IPv6 Address Text Representation".

NOTE: Available at <https://www.rfc-editor.org/info/rfc5952>.

[12] IETF RFC 4632: "Classless Inter-domain Routing (CIDR): The Internet Address Assignment and Aggregation Plan".

NOTE: Available at <https://www.rfc-editor.org/info/rfc4632>.

## 2.2 Informative 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.

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 002: "Multi-access Edge Computing (MEC); Phase 2: Use Cases and Requirements".

[i.2] OpenAPI™ Specification.

NOTE: Available at [https://github.com/OAI/OpenAPI-Specification](https://protect2.fireeye.com/url?k=d4c71c9c-89144013-d4c697d3-0cc47a31ce52-791643259d8f10e2&q=1&u=https%3A%2F%2Fgithub.com%2FOAI%2FOpenAPI-Specification).

[i.3] ETSI GR 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 GR MEC 001 [i.3] apply.

## 3.2 Symbols

Void.

## 3.3 Abbreviations

For the purposes of the present document, the abbreviations given in ETSI GR MEC 001 [i.3] and the following apply:

BW BandWidth

BWM BandWidth Management

BWMS BandWidth Management Service

CDN Content Delivery Network

DSCP Differentiated Services Code Point

MTS Multi-access Traffic Steering

NR New Radio

OAI Open API Initiative

RTT Round Trip Time

TM Traffic Management

TMS Traffic Management Service

UTRA Universal Terrestrial Radio Access

# 4 Void

# 5 Overview

The present document specifies the Traffic Management (TM) APIs to support the requirements defined for Multi‑Access Edge Computing in ETSI GS MEC 002 [i.1]. There are two TM services: BandWidth Management (BWM) service and Multi-access Traffic Steering (MTS) service. Clause 6 introduces how TM services can be used by the multi-access edge applications and by the multi-access edge platform. It describes the information flows used for TM services.

The information that can be exchanged over the TM APIs is described in clause 7 which provides detailed description on all information elements that are used for TM services.

Clauses 8 and 9 describe the actual TM APIs (BWM API and MTS API) providing detailed information on how information elements are mapped into a RESTful API design.

Figure 5-1 illustrates the mission of the TM services, which may optionally run as part of the platform or as an application. Different applications, whether managing a single instance or several sessions (for example CDN), may request specific Bandwidth Management (BWM) or/and Multi-access Traffic Steering (MTS) requirements for the whole application instance or different requirements per session. The TM services can aggregate all the requests and act in a manner that will help optimize the BW usage and improve Quality of user Experience for applications.



Figure 5-1: Traffic Management services description

# 6 Description of the service (informative)

## 6.1 Introduction

Different MEC applications running in parallel on the same MEC host may require specific static/dynamic up/down bandwidth resources, including bandwidth size and bandwidth priority. In some cases, different sessions running in parallel on the same application may each have specific bandwidth requirements. In addition, sessions driven by applications running from closer to end user (shorter RTT) may receive unfair advantage over sessions driven by applications running from distant locations (outside the RAN). To resolve potential resource conflicts between such competing applications, the following optional traffic management services may be used:

* BandWidth Management (BWM) service; and
* Multi-access Traffic Steering (MTS) service.

The BWM service is for allocating/adjusting bandwidth resources, including bandwidth size and bandwidth priority, for MEC applications, and allows MEC applications to provide bandwidth requirements.

The MTS service is for seamlessly steering/splitting/duplicating application data traffic across multiple access network connections. The MTS allows:

1. MEC applications to get informed of various MTS capabilities and multi-access network connection info.
2. MEC applications to provide requirements, e.g. delay, throughput, loss, for influencing traffic management operations.

The specific session or MEC application will be identified using a set of filters within the resource request.

## 6.2 Sequence diagrams

### 6.2.1 General

The following clauses describe how multi-access edge applications can use TMS to update/receive Bandwidth Management (BWM) or/and Multi-access Traffic Steering (MTS) information to/from the MEC platform. The sequence diagrams that are relevant for TMS are presented.

The TM APIs enable the MEC applications to register or unregister for specific bandwidth allocation or/and multi-access traffic steering requirement. The "Registration" flow is used to create a bandwidthAllocation as shown in clause 6.2.2 or a mtsSession as shown in clause 6.2.7. It is operated on per-allocation/session basis, and can be used multiple times by the application to create multiple bandwidthAllocations or mtsSessions. The "Unregistration" flow is used to delete a bandwidthAllocation as shown in clause 6.2.3 or a mtsSession as shown in clause 6.2.8.

The present document of TM APIs contains the HTTP protocol bindings for traffic management functionality using the REST architectural style.

### 6.2.2 Register to Bandwidth Management Service

Figure 6.2.2-1 shows a scenario where a MEC Application instance registers to BWMS.

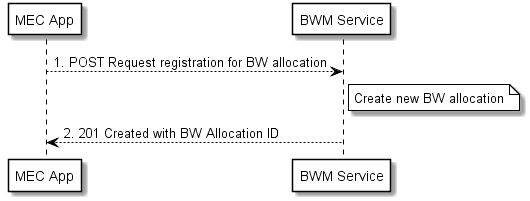


Figure 6.2.2-1: Flow of MEC Application registration to BWMS

MEC Application instance registration to BWMS, as illustrated in figure 6.2.2-1, consists of the following steps:

1. MEC application instance sends a request to register to the BWMS with the requested bandwidth requirements (bandwidth size/priority).
2. BWMS responds with a registration and initialization approval.

### 6.2.3 Unregister from Bandwidth Management Service

Figure 6.2.3-1 shows a scenario where a MEC Application Instance unregisters from BWMS.

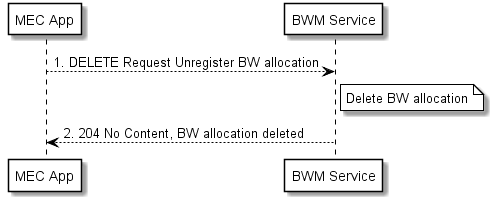


Figure 6.2.3-1: Flow of MEC Application unregistering BW allocation from BWMS

MEC Application Instance unregistering from BWMS , as illustrated in figure 6.2.3-1, consists of the following steps:

1. MEC Application instance sends an unregister request to BWMS.
2. BWMS responds with an unregistration approval.

### 6.2.4 Update requested bandwidth requirements on BWM Service

Figure 6.2.4-1 shows a scenario where a MEC Application instance updates its requested bandwidth requirements on the BWMS.

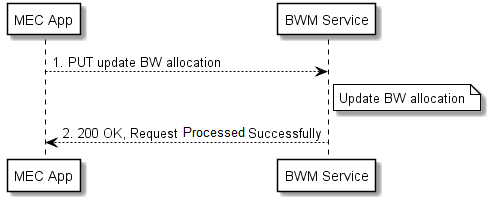


Figure 6.2.4-1: Flow of MEC application updating its requested   
bandwidth requirements on BWMS

MEC application instance updating its requested bandwidth requirements on BWMS, as illustrated in figure 6.2.4-1, consists of the following steps:

1. MEC Application instance sends a request to update a specific bandwidth allocation on the BWMS.
2. BWMS responds with an update approval.

### 6.2.5 Get configured bandwidth allocation from BWM Service

Figure 6.2.5-1 shows a scenario where a MEC Application instance gets its configured bandwidth allocation from the BWMS.

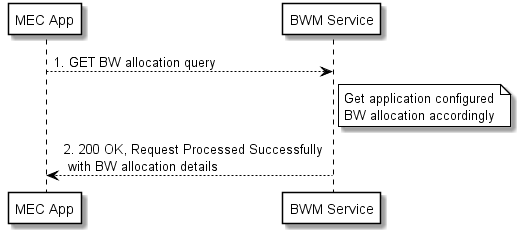


Figure 6.2.5-1: Flow of MEC Application getting its configured   
bandwidth allocation from BWMS

MEC Application instance gets its configured bandwidth from BWMS, as illustrated in figure 6.2.5-1, consists of the following steps:

1. MEC Application instance sends a request to get its configured bandwidth allocation on the BWMS.
2. BWMS responds with the BW allocation details.

### 6.2.6 Get MTS service Info from the MTS Service

Figure 6.2.6-1 shows a scenario where a MEC Application instance gets the available MTS service information from the MTS service.

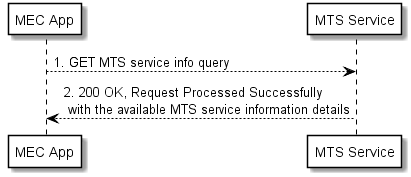


Figure 6.2.6-1: Flow of MEC Application getting the MTS service info

MEC Application instance gets the available MTS service info from the MTS service, as illustrated in figure 6.2.6-1, consists of the following steps:

1. MEC Application instance sends a request to get the available MTS service information.
2. The MTS service responds with the available MTS service information details.

### 6.2.7 Register to the MTS service

Figure 6.2.7-1 shows a scenario where a MEC Application instance registers to the MTS service.

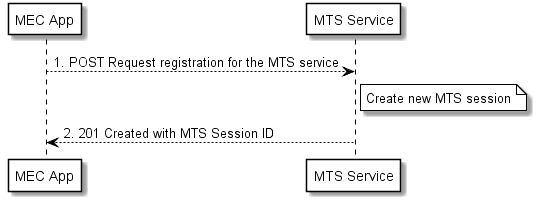


Figure 6.2.7-1: Flow of MEC Application registration to the MTS service

MEC Application instance registration to the MTS service, as illustrated in figure 6.2.7-1, consists of the following steps:

1. MEC Application instance sends a request to register to the MTS service with the requested requirements.
2. The MTS service responds with a registration and initialization approval.

### 6.2.8 Unregister from the MTS service

Figure 6.2.8-1 shows a scenario where a MEC Application instance unregisters from the MTS service.

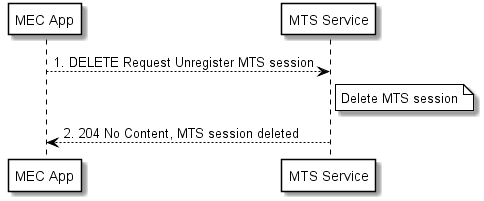


Figure 6.2.8-1: Flow of MEC Application unregistering MTS session from the MTS service

MEC Application instance unregistering from the MTS service, as illustrated in figure 6.2.8-1, consists of the following steps:

1. MEC Application instance sends an unregister request to the MTS service.
2. MTS responds with an unregistration approval.

### 6.2.9 Update requested requirements on the MTS service

Figure 6.2.9-1 shows a scenario where a MEC Application instance updates its requested requirements on the MTS service.

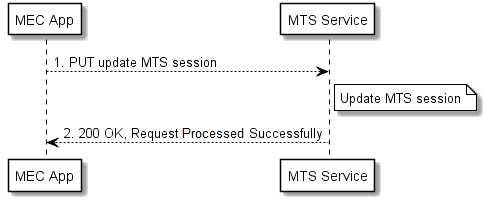


Figure 6.2.9-1: Flow of MEC application updating its requested  
requirements on the MTS service

MEC Application instance updating its requested requirements on the MTS service, as illustrated in figure 6.2.9‑1, consists of the following steps:

1. MEC Application instance sends a request to update a specific MTS session on the MTS service.
2. The MTS service responds with an update approval.

### 6.2.10 Get configured MTS session from the MTS service

Figure 6.2.10-1 shows a scenario where a MEC Application instance gets its configured MTS session from the MTS service.

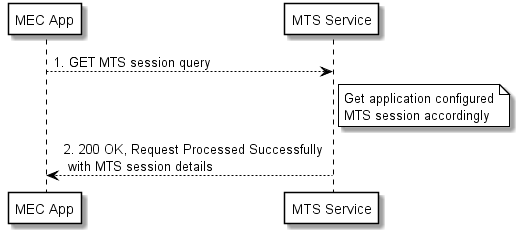


Figure 6.2.10-1: Flow of MEC Application getting its configured   
MTS session info from the MTS service

MEC Application instance gets its configured MTS session information from the MTS service, as illustrated in figure 6.2.10-1, consists of the following steps:

1. MEC Application instance sends a request to get its configured MTS session information on the MTS service.
2. The MTS service responds with the MTS session details.

# 7 Data Model

## 7.1 Introduction

The following clauses provide the description of the Data Model.

## 7.2 Resource data types

### 7.2.1 Introduction

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

### 7.2.2 Type: BwInfo

Table 7.2.2-1: Elements of BwInfo

|  |  |  |  |
| --- | --- | --- | --- |
| Element | Type | Cardinality | Description |
| allocationId | String | 0..1 | Bandwidth allocation instance identifier |
| timeStamp | Structure (inlined) | 0..1 | Time stamp to indicate when the corresponding information elements are sent |
| >seconds | Uint32 | 1 | The seconds part of the Time. Time is defined as Unix‑time since January 1, 1970, 00:00:00 UTC |
| >nanoSeconds | Uint32 | 1 | The nanoseconds part of the Time. Time is defined as Unix-time since January 1, 1970, 00:00:00 UTC |
| appInsId | String | 1 | Application instance identifier |
| appName | String | 0..1 | Name of the application |
| requestType | Enum (inlined) | 1 | Numeric value (0 - 255) corresponding to specific type of consumer as following:  0 = APPLICATION\_SPECIFIC\_BW\_ALLOCATION  1 = SESSION\_SPECIFIC\_BW\_ALLOCATION |
| sessionFilter | Structure (inlined) | 0..N | Session filtering criteria, applicable when requestType is set as SESSION\_SPECIFIC\_BW\_ALLOCATION. Any filtering criteria shall define a single session only. In case multiple sessions match sessionFilter, the request shall be rejected |
| >sourceIp | String | 0..1 | Source address identity of session. The string for an IPv4 address shall be formatted in the "dotted decimal" notation as defined in IETF RFC 1166 [10]. The string for an IPv6 address shall be formatted according to clause 4 of IETF RFC 5952 [11], with in CIDR notation [12] used to provide the routing prefix |
| >sourcePort | String | 0..1 | Source port identity of session |
| >dstAddress | String | 0..1 | Destination address identity of session. The string for an IPv4 address shall be formatted in the "dotted decimal" notation as defined in IETF RFC 1166 [10]. The string for an IPv6 address shall be formatted according to clause 4 of IETF RFC 5952 [11], with in CIDR notation [12] used to provide the routing prefix |
| >dstPort | String | 0..1 | Destination port identity of session |
| >protocol | String | 0..1 | Protocol number |
| fixedBWPriority | Enum | 0..1 | Indicates the allocation priority when dealing with several applications or sessions in parallel. Values are not defined in the present document |
| fixedAllocation | String | 1 | Size of requested fixed BW allocation in [bps] |
| allocationDirection | String | 1 | The direction of the requested BW allocation:  00 = Downlink (towards the UE)  01 = Uplink (towards the application/session)  10 = Symmetrical |

### 7.2.3 Type: BwInfoDeltas

Conforming to JSON merge patch format and processing rules specified IETF RFC 7396 [7], this type represents the attributes whose value are allowed to be updated with HTTP PATCH method in content format JSON. It shall follow the indications provided in table 7.2.3-1.

Table 7.2.3-1: Elements of BwInfoDeltas

|  |  |  |  |
| --- | --- | --- | --- |
| Attribute name | Data type | Cardinality | Description |
| allocationId | String | 1 | Bandwidth allocation instance identifier |
| appInsId | String | 1 | Application instance identifier |
| requestType | Enum (inlined) | 1 | Numeric value (0 - 255) corresponding to specific type of consumer as following:  0 = APPLICATION\_SPECIFIC\_BW\_ALLOCATION  1 = SESSION\_SPECIFIC\_BW\_ALLOCATION |
| sessionFilter | Structure (inlined) | 0..N | Session filtering criteria, applicable when requestType is set as SESSION\_SPECIFIC\_BW\_ALLOCATION. Any filtering criteria shall define a single session only. In case multiple sessions match sessionFilter, the request shall be rejected |
| >sourceIp | String | 0..1 | Source address identity of session. The string for an IPv4 address shall be formatted in the "dotted decimal" notation as defined in IETF RFC 1166 [10]. The string for an IPv6 address shall be formatted according to clause 4 of IETF RFC 5952 [11], with in CIDR notation [12] used to provide the routing prefix |
| >sourcePort | String | 0..1 | Source port identity of session |
| >dstAddress | String | 0..1 | Destination address identity of session. The string for an IPv4 address shall be formatted in the "dotted decimal" notation as defined in IETF RFC 1166 [10]. The string for an IPv6 address shall be formatted according to clause 4 of IETF RFC 5952 [11], with in CIDR notation [12] used to provide the routing prefix |
| >dstPort | String | 0..1 | Destination port identity of session |
| >protocol | String | 0..1 | Protocol number |
| fixedBWPriority | Enum (inlined) | 0..1 | Indicates the allocation priority when dealing with several applications or sessions in parallel. Values are not defined in the present document |
| fixedAllocation | String | 0..1 | Size of requested fixed BW allocation in [bps] |
| allocationDirection | String | 0..1 | The direction of the requested BW allocation:  00 = Downlink (towards the UE)  01 = Uplink (towards the application/session)  10 = Symmetrical |

### 7.2.4 Type: MtsCapabilityInfo

Table 7.2.4-1: Attributes of the MtsCapabilityInfo

| Attribute name | Data type | Cardinality | Description |
| --- | --- | --- | --- |
| timeStamp | Structure (inlined) | 0..1 | Time stamp to indicate when the corresponding information elements are sent |
| >seconds | Uint32 | 1 | Time in seconds in Unix-time since January 1, 1970, 00:00:00 UTC |
| >nanoSeconds | Uint32 | 1 | Time in nanoseconds in Unix-time since January 1, 1970, 00:00:00 UTC |
| mtsAccessInfo | Structure (inlined) | 1..N | The information on access network connection as defined below |
| >accessId | Uint32 | 1 | Unique identifier for the access network connection |
| >accessType | Uint32 | 1 | Numeric value (0-255) corresponding to specific type of access network as following:  0 = Unknown  1 = Any IEEE802.11-based WLAN technology  2 = Any 3GPP-based Cellular technology  3 = Any Fixed Access  11 = IEEE802.11 a/b/g WLAN  12 = IEEE 802.11 a/b/g/n WLAN  13 = IEEE 802.11 a/b/g/n/ac WLAN  14 = IEEE 802.11 a/b/g/n/ac/ax WLAN (Wi-Fi 6)  15 = IEEE 802.11 b/g/n WLAN  31 = 3GPP GERAN/UTRA (2G/3G)  32 = 3GPP E-UTRA (4G/LTE)  33 = 3GPP NR (5G) |
| >metered | Uint32 | 1 | Numeric value (0-255) corresponding to the following:  0: the connection is not metered (see note)  1: the connection is metered  2: unknown |
| mtsMode | Uint32 | 1..N | Numeric value corresponding to a specific MTS operation supported by the TMS  0 = low cost, i.e. using the unmetered access network connection whenever it is available  1 = low latency, i.e. using the access network connection with lower latency  2 = high throughput, i.e. using the access network connection with higher throughput, or/and multiple access network connection simultaneously if supported  3 = redundancy, i.e. sending duplicated (redundancy) packets over multiple access network connections for high‑reliability and low-latency applications  4 = QoS, i.e. performing MTS based on the specific QoS requirements from the app |
| NOTE: A metered connection is a network connection that has a maximum data usage in a specific period, e.g. per hour/day/week/month. The user may get billed extra charges if they go over the allotted amount. | | | |

### 7.2.5 Type: MtsSessionInfo

Table 7.2.5-1: Elements of MtsSessionInfo

| **Element** | **Type** | **Cardinality** | **Description** |
| --- | --- | --- | --- |
| sessionId | String | 0..1 | MTS session instance identifier |
| timeStamp | Structure (inlined) | 0..1 | Time stamp to indicate when the corresponding information elements are sent |
| >seconds | Uint32 | 1 | The seconds part of the Time. Time is defined as Unix‑time since January 1, 1970, 00:00:00 UTC |
| >nanoSeconds | Uint32 | 1 | The nanoseconds part of the Time. Time is defined as Unix-time since January 1, 1970, 00:00:00 UTC |
| appInsId | String | 1 | Application instance identifier |
| appName | String | 0..1 | Name of the application |
| requestType | Enum (inlined) | 1 | Numeric value (0 - 255) corresponding to specific type of consumer as following:  0 = APPLICATION\_SPECIFIC\_MTS\_SESSION  1 = FLOW\_SPECIFIC\_MTS\_SESSION |
| flowFilter | Structure (inlined) | 1..N | Traffic flow filtering criteria, applicable only if when requestType is set as FLOW\_SPECIFIC\_MTS\_SESSION. Any filtering criteria shall define a single session only. In case multiple sessions match flowFilter, the request shall be rejected. If the flowFilter field is included, at least one of its subfields shall be included. Any flowFilter subfield that is not included shall be ignored in traffic flow filtering |
| >sourceIp | String | 0..1 | Source address identity of session. The string for an IPv4 address shall be formatted in the "dotted decimal" notation as defined in IETF RFC 1166 [10]. The string for an IPv6 address shall be formatted according to clause 4 of IETF RFC 5952 [11], with in CIDR notation [12] used to provide the routing prefix |
| >sourcePort | Uint32 | 0..1 | Source port identity of session |
| >dstIp | String | 0..1 | Destination address identity of session. The string for an IPv4 address shall be formatted in the "dotted decimal" notation as defined in IETF RFC 1166 [10]. The string for an IPv6 address shall be formatted according to clause 4 of IETF RFC 5952 [11], with in CIDR notation [12] used to provide the routing prefix |
| >dstPort | Uint32 | 0..1 | Destination port identity of session |
| >protocol | Uint32 | 0..1 | Protocol number |
| >dscp | Uint32 | 0..1 | DSCP in the IPv4 header or Traffic Class in the IPv6 header |
| >flowlabel | Uint32 | 0..1 | Flow Label in the IPv6 header, applicable only if the flow is IPv6 |
| qosD | Structure | 1 | QoS requirement description of the MTS session, applicable only if mtsMode = 4 (QoS). If the qosD field is included, at least one of its subfields shall be included. Any qosD subfield that is not included shall be ignored in Multi-access Traffic Steering (MTS) |
| >minTpt | Unit32 | 0..1 | minimal throughput in [kbps] |
| >maxLatency | Unit32 | 0..1 | tolerable (one-way) delay in [10 nanoseconds] |
| >maxLoss | Unit32 | 0..1 | tolerable packet loss rate in [1/10^x] |
| >maxJitter | Unit32 | 0..1 | tolerable jitter in [10 nanoseconds] |
| >priority | Unit32 | 0..1 | numeric value (0 - 255) corresponding to the traffic priority:  0: low;  1: medium;  2: high;  3: critical |
| mtsMode | Uint32 | 1 | Numeric value (0 - 255) corresponding to a specific MTS mode of the MTS session:  0 = low cost, i.e. using the unmetered access network connection whenever it is available  1 = low latency, i.e. using the access network connection with lower latency  2 = high throughput, i.e. using the access network connection with higher throughput, or multiple access network connection simultaneously  3 = redundancy, i.e. sending duplicated (redundancy) packets over multiple access network connections for high-reliability and low-latency applications  4 = QoS, i.e. performing MTS based on the QoS requirement (qosD) |
| trafficDirection | String | 1 | The direction of the requested MTS session:  00 = Downlink (towards the UE)  01 = Uplink (towards the application/session)  10 = Symmetrical (see note) |
| NOTE: For the downlink direction of a symmetrical flow, "sourceIp" and "sourcePort" in the "flowFilter" structure are used for source address and port, respectively; "dstIp" and "dstPort" are used for destination address and port, respectively. For the uplink direction of a symmetrical flow, "sourceIp" and "sourcePort" are used for destination address and port, respectively; "dstIp" and "dstPort" are used for source address and port, respectively. | | | |

# 8 BWM API definition

## 8.1 Introduction

This clause defines the resources and operations of the Bandwidth Management API (BWM API).

## 8.2 Global definitions and resource structure

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

**{apiRoot}/{apiName}/{apiVersion}/**

"apiRoot" and "apiName" are discovered using the service registry. It includes the scheme ("https"), host and optional port, and an optional prefix string. The "apiName" shall be set to "bwm" and "apiVersion" shall be set to "v1" for the present document. All resource URIs in the clauses below are defined relative to the above root URI.

The API shall support HTTP over TLS (also known as HTTPS) using TLS version 1.2 (as defined by IETF RFC 5246 [3]). TLS 1.3 (including the new specific requirements for TLS 1.2 implementations) defined by IETF RFC 8446 [9] should be supported. HTTP without TLS shall not be used. Versions of TLS earlier than 1.2 shall neither be supported nor used.

The content format of 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 [4] with bearer tokens according to IETF RFC 6750 [5]. See clause 6.16 of ETSI GS MEC 009 [6] for more information. How the token endpoint and client credentials are provisioned into the mobile edge applications 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 [6] for more information.

Figure 8.2-1 illustrates the resource URI structure of this API.

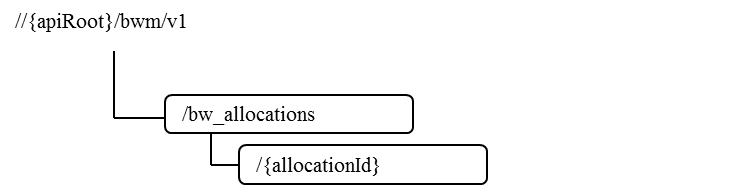


Figure 8.2-1: Resource URI structure of the BWM API

Table 8.2-1 provides an overview of the resources defined by the present document, and the applicable HTTP methods.

Table 8.2-1: HTTP methods overview

|  |  |  |  |
| --- | --- | --- | --- |
| Resource name | Resource URI | HTTP method | Meaning |
| A list of bandwithAllocation | /bw\_allocations | **GET** | Retrieve information about a list of bandwidthAllocation resources |
| **POST** | Create a bandwidthAllocation resource |
| Individual bandwithAllocation | /bw\_allocations/{allocationId} | **GET** | Retrieve information about a specific bandwidthAllocation |
| **PUT** | Update the information about a specific bandwidthAllocation |
| **PATCH** | Modify the information about a specific existing bandwidthAllocation by sending updates on the data structure |
| **DELETE** | Remove a specific bandwidthAllocation |

## 8.3 Resource: individual bandwidthAllocation

### 8.3.1 Description

This resource is used to represent a bandwidth allocation instance, which follows the resource data type of "BwInfo" as specified in clause 7.2.2.

### 8.3.2 Resource definition

Resource URI: {apiRoot}/bwm/v1/bw\_allocations/{allocationId}

Resource URI Variables for this resource are defined in table 8.3.2-1.

Table 8.3.2-1: Resource URI Variables for resource "individual bandwidthAllocation"

|  |  |
| --- | --- |
| Name | Definition |
| apiRoot | See clause 8.2 |
| allocationId | Represents a bandwidth allocation instance |

### 8.3.3 Resource Methods

#### 8.3.3.1 GET

This method retrieves information about a bandwidthAllocation resource. This method is typically used in "Get configured bandwidth allocation from Bandwidth Management Service" procedure as described in clause 6.2.5.

This method shall comply with the URI query parameters, request and response data structures, and response codes, as specified in tables 8.3.3.1-1 and 8.3.3.1-2.

Table 8.3.3.1-1: URI query parameters supported by the GET method on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Name | Data type | Cardinality | Remarks |
| n/a |  |  |  |

Table 8.3.3.1-2: 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 |
| BwInfo | 1 | 200 OK | It is used to indicate nonspecific success. The response body contains a representation of the 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. |

#### 8.3.3.2 PUT

This method updates the information about a bandwidthAllocation resource. As specified in ETSI GS MEC 009 [6], the PUT HTTP method has "replace" semantics.

PUT method is typically used in "Update requested bandwidth requirements on Bandwidth Management Service" procedure as described in clause 6.2.4.

PUT HTTP method shall comply with the URI query parameters, request and response data structures, and response codes, as specified in tables 8.3.3.2-1 and 8.3.3.2-2.

Table 8.3.3.2-1: URI query parameters supported by the PUT method on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Name | Data type | Cardinality | Remarks |
| n/a |  |  |  |

Table 8.3.3.2-2: Data structures supported by the PUT request/response on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Request body | Data type | Cardinality | Remarks | |
| BwInfo | 1 | BwInfo with updated information is included as entity body of the request. | |
| Response body | Data type | Cardinality | Response  codes | Remarks |
| BwInfo | 1 | 200 OK | Upon success, a response body containing data type describing the updated BwInfo is returned. |
| 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. |

#### 8.3.3.3 PATCH

This method updates the information about a bandwidthAllocation resource. As specified in ETSI GS MEC 009 [6], the PATCH HTTP method updates a resource on top of the existing resource state by just including the changes ("deltas") in the request body.

PATCH method is used in "Update requested bandwidth requirements on Bandwidth Management Service" procedure.

PATCH HTTP method shall comply with the URI query parameters, request and response data structures, and response codes, as specified in tables 8.3.3.3-1 and 8.3.3.3-2.

Table 8.3.3.3-1: URI query parameters supported by the PATCH method on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Name | Data type | Cardinality | Remarks |
| n/a |  |  |  |

Table 8.3.3.3-2: Data structures supported by the PATCH request/response on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Request body | Data type | Cardinality | Remarks | |
| BwInfoDeltas | 1 | Description of the changes to instruct the server how to modify the resource representation. | |
| Response body | Data type | Cardinality | Response  Codes | Remarks |
| BwInfo | 1 | 200 OK | Upon success, a response body containing data type describing the updated BwInfo is returned. |
| 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, or the client is not authorized to perform it.  More information shall be provided in the "details" 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. |

#### 8.3.3.4 POST

Not supported.

#### 8.3.3.5 DELETE

DELETE method is typically used in "Unregister from Bandwidth Management Service" procedure as described in clause 6.2.3.

DELETE HTTP method shall comply with the URI query parameters, request and response data structures, and response codes, as specified in tables 8.3.3.5-1 and 8.3.3.5-2.

Table 8.3.3.5-1: URI query parameters supported by the DELETE method on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Name | Data type | Cardinality | Remarks |
| n/a |  |  |  |

Table 8.3.3.5-2: Data structures supported by the DELETE request/response on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Request body | Data type | Cardinality | Remarks | |
| n/a |  |  | |
| Response body | Data type | Cardinality | Response  codes | Remarks |
| n/a |  | 204 No Content |  |
| 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. |

## 8.4 Resource: a list of bandwidthAllocations

### 8.4.1 Description

This resource is used to represent a list of mobile edge bandwidth allocations.

### 8.4.2 Resource definition

Resource URI: {apiRoot}/bwm/v1/bw\_allocations

Resource URI Variables for this resource are defined in table 8.4.2-1.

Table 8.4.2-1: Resource URI Variables for resource a list of bandwithAllocations

|  |  |
| --- | --- |
| Name | Definition |
| apiRoot | See clause 8.2 |

### 8.4.3 Resource Methods

#### 8.4.3.1 GET

This method retrieves information about a list of bandwidthAllocation resources. This method is typically used in "Get configured bandwidth allocation from Bandwidth Management Service" procedure as described in clause 6.2.5.

This method shall comply with the URI query parameters, request and response data structures, and response codes, as specified in tables 8.4.3.1-1 and 8.4.3.1-2. When no URI query parameter is present, all the relevant bandwidthAllocations resources to the requestor will be returned.

Table 8.4.3.1-1: URI query parameters supported by the GET method on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Name | Data type | Cardinality | Remarks |
| app\_instance\_id | String | 0..N | A MEC application instance may use multiple app\_instance\_ids as an input parameter to query the bandwidth allocation of a list of MEC application instances. app\_instance\_id corresponds to appInsId defined in table 7.2.2-1.  See note. |
| app\_name | String | 0..N | A MEC application instance may use multiple app\_names as an input parameter to query the bandwidth allocation of a list of MEC application instances. app\_name corresponds to appName defined in table 7.2.2-1.  See note. |
| session\_id | String | 0..N | A MEC application instance may use session\_id as an input parameter to query the bandwidth allocation of a list of sessions. session\_id corresponds to allocationId defined in table 7.2.2-1.  See note. |
| NOTE: Either "app\_instance\_id" or "app\_name" or "session\_id" or none of them shall be present. | | | |

Table 8.4.3.1-2: 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 |
| BwInfo | 0..N | 200 OK | Upon success, a response body containing an array of the bandwidthAllocations is returned. |
| 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. |

#### 8.4.3.2 PUT

Not supported.

#### 8.4.3.3 PATCH

Not supported.

#### 8.4.3.4 POST

This method is used to create a bandwidthAllocation resource. This method is typically used in "Register to Bandwidth Management Service" procedure as described in clause 6.2.1.

POST HTTP method shall comply with the URI query parameters, request and response data structures, and response codes, as specified in tables 8.4.3.4-1 and 8.4.3.4-2.

Table 8.4.3.4-1: URI query parameters supported by the POST method on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Name | Data type | Cardinality | Remarks |
| n/a |  |  |  |

Table 8.4.3.4-2: Data structures supported by the POST request/response on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Request body | Data type | Cardinality | Remarks | |
| BwInfo | 1 | Entity body in the request contains BwInfo to be created. | |
| Response body | Data type | Cardinality | Response  codes | Remarks |
| BwInfo | 1 | 201 Created | Upon success, the HTTP response shall include a "Location" HTTP header that contains the resource URI of the created 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. |

#### 8.4.3.5 DELETE

Not supported.

# 9 MTS API definition

## 9.1 Introduction

This clause defines the resources and operations of the Multi-access Traffic Steering API (MTS API).

## 9.2 Global definitions and resource structure

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

**{apiRoot}/{apiName}/{apiVersion}/**

"apiRoot" and "apiName" are discovered using the service registry. It includes the scheme ("https"), host and optional port, and an optional prefix string. The "apiName" shall be set to "mts" and "apiVersion" shall be set to "v1" for the present document. All resource URIs in the clauses below are defined relative to the above root URI.

The API shall support HTTP over TLS (also known as HTTPS) using TLS version 1.2 (as defined by IETF RFC 5246 [3]). TLS 1.3 (including the new specific requirements for TLS 1.2 implementations) defined by IETF RFC 8446 [9] should be supported. HTTP without TLS shall not be used. Versions of TLS earlier than 1.2 shall neither be supported nor used.

The content format of 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 [4] with bearer tokens according to IETF RFC 6750 [5]. See clause 6.16 of ETSI GS MEC 009 [6] for more information. How the token endpoint and client credentials are provisioned into the MEC applications 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 [6] for more information.

Figure 9.2-1 illustrates the resource URI structure of this API.

//{apiRoot}/mts/v1

/mts\_sessions

/{sessionId}

/mts\_capability\_info

Figure 9.2-1: Resource URI structure of the MTS API

Table 9.2-1 provides an overview of the resources defined by the present document, and the applicable HTTP methods.

Table 9.2-1: HTTP methods overview

|  |  |  |  |
| --- | --- | --- | --- |
| **Resource name** | **Resource URI** | **HTTP method** | **Meaning** |
| MTS capability information | /mts\_capability\_info | **GET** | Retrieve the MTS capability information |
| Individual  MTS session | /mts\_sessions/{sessionId} | **GET** | Retrieve information about specific MTS session |
| **PUT** | Update the information about specific MTS session |
| **DELETE** | Remove specific MTS session |
| A list of  MTS sessions | /mts\_sessions | **GET** | Retrieve information about a list of MTS sessions |
| **POST** | Create a MTS session |

## 9.3 Resource: MTS information

### 9.3.1 Description

This resource is used to represent a MTS service instance, which follows the resource data type of "MtsCapabilityInfo" as specified in clause 7.2.4.

### 9.3.2 Resource definition

Resource URI: {apiRoot}/mts/v1/mts\_capability\_info

This resource shall support the resource URI variables defined in table 9.3.2-1.

Table 9.3.2-1: Resource URI Variables for resource "MTS information"

|  |  |
| --- | --- |
| Name | Definition |
| apiRoot | See clause 9.2 |

### 9.3.3 Resource Methods

#### 9.3.3.1 GET

The GET method is used to query information about the MTS information. This method is typically used in the "Get MTS service Info from the MTS Service" procedure as described in clause 6.2.6.

This method shall support the URI query parameters, request and response data structures, and response codes, as specified in tables 9.3.3.1-1 and 9.3.3.1-2.

Table 9.3.3.1-1: URI query parameters supported by the GET method on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Name | Data type | Cardinality | Remarks |
| n/a |  |  |  |

Table 9.3.3.1-2: 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 |
| MtsCapabilityInfo | 1 | 200 OK | Upon success, a response body containing the MTS capability information is returned. |
| ProblemDetails | 0..1 | 400 Bad Request | It is used to indicate that incorrect parameters were passed in the request. This error condition can also occur if the target area for the request is considered too large.  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 | 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. |

## 9.4 Resource: individual MTS session

### 9.4.1 Description

This resource is used to represent a MTS instance, which follows the resource data type of "MtsSessionInfo" as specified in clause 7.2.5.

### 9.4.2 Resource definition

Resource URI: {apiRoot}/mts/v1/mts\_sessions/{sessionId}

This resource shall support the resource URI variables defined in table 9.4.2-1.

Table 9.4.2-1: Resource URI Variables for resource "individual MTS session"

|  |  |
| --- | --- |
| Name | Definition |
| apiRoot | See clause 9.2 |
| sessionId | Represents a MTS session instance |

### 9.4.3 Resource Methods

#### 9.4.3.1 GET

This method retrieves information about an individual MTS session. This method is typically used in the "Get configured MTS Session Info from the MTS Service" procedure as described in clause 6.2.10.

This method shall comply with the URI query parameters, request and response data structures, and response codes, as specified in tables 9.4.3.1-1 and 9.4.3.1-2.

Table 9.4.3.1-1: URI query parameters supported by the GET method on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Name | Data type | Cardinality | Remarks |
| n/a |  |  |  |

Table 9.4.3.1-2: 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 |
| MtsSessionInfo | 1 | 200 OK | It is used to indicate nonspecific success. The response body contains a representation of the 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. |

#### 9.4.3.2 PUT

This method updates the information about an individual MTS session. As specified in ETSI GS MEC 009 [6], the PUT HTTP method has "replace" semantics.

PUT method is typically used in the "Update requested requirements on the MTS Service" procedure as described in clause 6.2.9.

PUT HTTP method shall comply with the URI query parameters, request and response data structures, and response codes, as specified in tables 9.4.3.2-1 and 9.4.3.2-2.

Table 9.4.3.2-1: URI query parameters supported by the PUT method on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Name | Data type | Cardinality | Remarks |
| n/a |  |  |  |

Table 9.4.3.2-2: Data structures supported by the PUT request/response on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Request body | Data type | Cardinality | Remarks | |
| MtsSessionInfo | 1 | MtsSessionInfo with updated information is included as entity body of the request. | |
| Response body | Data type | Cardinality | Response  codes | Remarks |
| MtsSessionInfo | 1 | 200 OK | Upon success, a response body containing data type describing the updated MtsSessionInfo is returned. |
| 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. |

#### 9.4.3.3 DELETE

DELETE method is typically used in "Unregister from the MTS Service" procedure as described in clause 6.2.8.

DELETE HTTP method shall comply with the URI query parameters, request and response data structures, and response codes, as specified in tables 9.4.3.3-1 and 9.4.3.3-2.

Table 9.4.3.3-1: URI query parameters supported by the DELETE method on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Name | Data type | Cardinality | Remarks |
| n/a |  |  |  |

Table 9.4.3.3-2: Data structures supported by the DELETE request/response on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Request body | Data type | Cardinality | Remarks | |
| n/a |  |  | |
| Response body | Data type | Cardinality | Response  codes | Remarks |
| n/a |  | 204 No Content |  |
| 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. |

## 9.5 Resource: a list of MTS sessions

### 9.5.1 Description

This resource is used to represent a list of MTS sessions.

### 9.5.2 Resource definition

Resource URI: {apiRoot}/mts/v1/mts\_sessions

This resource shall support the resource URI variables defined in table 9.5.2-1.

Table 9.5.2-1: Resource URI Variables for resource "a list of MTS sessions"

|  |  |
| --- | --- |
| Name | Definition |
| apiRoot | See clause 9.2 |

### 9.5.3 Resource Methods

#### 9.5.3.1 GET

This method retrieves information about a list of MTS sessions. This method is typically used in the "Get configured MTS Session Info from the MTS Service" procedure as described in clause 6.2.10.

This method shall comply with the URI query parameters, request and response data structures, and response codes, as specified in tables 9.5.3.1-1 and 9.5.3.1-2.

Table 9.5.3.1-1: URI query parameters supported by the GET method on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Name | Data type | Cardinality | Remarks |
| app\_instance\_id | String | 0..N | A MEC application instance may use multiple app\_instance\_ids as an input parameter to query the MTS session of a list of MEC application instances. app\_instance\_id corresponds to appInsId defined in table 7.2.5-1.  See note. |
| app\_name | String | 0..N | A MEC application instance may use multiple app\_names as an input parameter to query the MTS session of a list of MEC application instances. app\_name corresponds to appName defined in table 7.2.5-1.  See note. |
| session\_id | String | 0..N | A MEC application instance may use session\_id as an input parameter to query the information of a list of MTS sessions. session\_id corresponds to sessionId defined in table 7.2.5-1.  See note. |
| NOTE: Either "app\_instance\_id" or "app\_name" or "session\_id" or none of them shall be present. | | | |

Table 9.5.3.1-2: 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 |
| MtsSessionInfo | 0..N | 200 OK | Upon success, a response body containing an array of the MTS sessions is returned. |
| 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. |

#### 9.5.3.2 POST

This method is used to create a MTS session. This method is typically used in "Register application to the MTS Service" procedure as described in clause 6.2.7.

POST HTTP method shall comply with the URI query parameters, request and response data structures, and response codes, as specified in tables 9.5.3.2-1 and 9.5.3.2-2.

Table 9.5.3.2-1: URI query parameters supported by the POST method on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Name | Data type | Cardinality | Remarks |
| n/a |  |  |  |

Table 9.5.3.2-2: Data structures supported by the POST request/response on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Request body | Data type | Cardinality | Remarks | |
| MtsSessionInfo | 1 | Entity body in the request contains MtsSessionInfo to be created. | |
| Response body | Data type | Cardinality | Response  codes | Remarks |
| MtsSessionInfo | 1 | 201 Created | Upon success, the HTTP response shall include a "Location" HTTP header that contains the resource URI of the created 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. |

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 Bandwidth Management API a supplementary description file compliant to the OpenAPI Specification [i.2].

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/gs015-bandwith-mgmt-api>.

# History

|  |  |  |
| --- | --- | --- |
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