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Mobile Edge Computing (MEC);
Mobile Edge Management;
Part 1: System, host and platform management

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Foreword

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

The present document is part 1 of a multi-part deliverable covering Mobile Edge Management, as identified below:

Part 1: "System, host and platform management";

Part 2: "Application lifecycle, rules and requirements management".

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 defines the management of the mobile edge system, mobile edge hosts and mobile edge platforms. This includes platform configuration, performance and fault management, application monitoring, remote service configuration and service control, information gathering regarding the platform features, available services, and available virtualised resources.

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 TS 132 302: "Digital cellular telecommunications system (Phase 2+) (GSM); Universal Mobile Telecommunications System (UMTS); LTE; Telecommunication management; Configuration Management (CM); Notification Integration Reference Point (IRP); Information Service (IS) (3GPP TS 32.302)".

[2] ETSI TS 132 602: "Digital cellular telecommunications system (Phase 2+) (GSM); Universal Mobile Telecommunications System (UMTS); LTE; Telecommunication management; Configuration Management (CM); Basic CM Integration Reference Point (IRP); Information Service (IS) (3GPP TS 32.602)".

[3] ETSI TS 132 662: "Digital cellular telecommunications system (Phase 2+) (GSM); Universal Mobile Telecommunications System (UMTS); LTE; Telecommunication management; Configuration Management (CM); Kernel CM Information Service (IS) (3GPP TS 32.662)".

[4] ETSI TS 132 111-2: "Digital cellular telecommunications system (Phase 2+) (GSM); Universal Mobile Telecommunications System (UMTS); LTE; Telecommunication management; Fault Management; Part 2: Alarm Integration Reference Point (IRP): Information Service (IS) (3GPP TS 32.111-2)".

[5] ETSI TS 132 332: "Digital cellular telecommunications system (Phase 2+) (GSM); Universal Mobile Telecommunications System (UMTS); LTE; Telecommunication management; Notification Log (NL) Integration Reference Point (IRP); Information Service (IS) (3GPP TS 32.332)".

[6] ETSI TS 128 622: "Universal Mobile Telecommunications System (UMTS); LTE; Telecommunication management; Generic Network Resource Model (NRM) Integration Reference Point (IRP); Information Service (IS) (3GPP TS 28.622)".

[7] ETSI TS 136 300: "LTE; Evolved Universal Terrestrial Radio Access (E-UTRA) and Evolved Universal Terrestrial Radio Access Network (E-UTRAN); Overall description; Stage 2 (3GPP TS 36.300)".

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

[9] ETSI TS 136 413: "LTE; Evolved Universal Terrestrial Radio Access Network (E-UTRAN); S1 Application Protocol (S1AP) (3GPP TS 36.413)".

[10] ETSI TS 132 103: "Digital cellular telecommunications system (Phase 2+) (GSM); Universal Mobile Telecommunications System (UMTS); LTE; Telecommunication management; Integration Reference Point (IRP) overview and usage guide (3GPP TS 32.103)".

[11] ETSI TS 132 150: "Digital cellular telecommunications system (Phase 2+) (GSM); Universal Mobile Telecommunications System (UMTS); LTE; Telecommunication management; Integration Reference Point (IRP) Concept and definitions (3GPP TS 32.150)".

[12] ETSI TS 132 151: "Digital cellular telecommunications system (Phase 2+) (GSM); Universal Mobile Telecommunications System (UMTS); LTE; Telecommunication management; Integration Reference Point (IRP) Information Service (IS) template (3GPP TS 32.151)".

[13] ETSI TS 132 152: "Digital cellular telecommunications system (Phase 2+) (GSM); Universal Mobile Telecommunications System (UMTS); LTE; Telecommunication management; Integration Reference Point (IRP) Information Service (IS) Unified Modelling Language (UML) repertoire (3GPP TS 32.152)".

[14] ETSI TS 132 153: "Digital cellular telecommunications system (Phase 2+) (GSM); Universal Mobile Telecommunications System (UMTS); LTE; Telecommunication management; Integration Reference Point (IRP) technology specific templates, rules and guidelines (3GPP TS 32.153)".

[15] ETSI TS 132 157: "Universal Mobile Telecommunications System (UMTS); LTE; Telecommunication management; Integration Reference Point (IRP) Information Service (IS) template (3GPP TS 32.157)".

[16] ETSI TS 132 156: "Universal Mobile Telecommunications System (UMTS); LTE; Telecommunication management; Fixed Mobile Convergence (FMC) model repertoire (3GPP TS 32.156)".

[17] ETSI TS 132 300: "Digital cellular telecommunications system (Phase 2+) (GSM); Universal Mobile Telecommunications System (UMTS); LTE; Telecommunication management; Configuration Management (CM); Name convention for Managed Objects (3GPP TS 32.300)".

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.

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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] ETSI GS MEC 001: "Mobile Edge Computing (MEC) Terminology".

3 Definitions and abbreviations

3.1 Definitions

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

3.2 Abbreviations

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

CM Configuration Management
DN Distinguished Name

DNS	Domain Name System
FQDN	Fully Qualified Domain Name
GS	Group Specification
IOC	Information Object Class
IP	Internet Protocol
IRP	Integration Reference Point
IS	Information Service
ISG	Industry Specification Group
MEC	Mobile Edge Computing
MEPM	Mobile Edge Platform Manager
NL	Notification Log
NM	Network Manager
OSS	Operations Support System
PLMN	Public Land Mobile Network
RAB	Radio Access Bearer
UE	User Equipment
UMTS	Universal Mobile Telecommunications System

4 Overview

The management interfaces are designed according to the IRP methodology defined in [10], [11], [12], [13], [14], [15] and [16]. Naming conventions for managed object instances are specified in [17].

5 Specification level requirements

5.1 Requirements

5.1.1 Requirements for reference point Mm2

5.1.1.1 Requirements related to the mobile edge host

5.1.1.1.1 Configuration Management requirements

REQ-MM2-MEH-CM-1: The Mm2 reference point shall support a capability allowing the OSS to retrieve the information model of the mobile edge host, or parts thereof, from the mobile edge platform manager.

REQ-MM2-MEH-CM-2: The Mm2 reference point shall support a capability allowing the mobile edge platform manager to notify changes related to the information model of the mobile edge host to the OSS.

REQ-MM2-MEH-CM-3: The Mm2 reference point shall support a capability allowing the OSS to configure the mobile edge host.

REQ-MM2-MEH-CM-4: The Mm2 reference point shall support a capability allowing the OSS to configure the DNS rules.

REQ-MM2-MEH-CM-5: The Mm2 reference point shall support a capability allowing the OSS to configure the traffic rules.

5.1.1.1.2 Fault Management requirements

REQ-MM2-MEH-FM-1: The Mm2 reference point shall support a capability allowing the mobile edge platform manager to send mobile edge platform related alarms to the OSS.

REQ-MM2-MEH-FM-2: The Mm2 reference point shall support a capability allowing the OSS to retrieve and manage alarms from the mobile edge platform manager.

5.1.1.2 Requirements related to the mobile edge applications

5.1.1.2.1 Configuration Management requirements

REQ-MM2-MEA-CM-1: The Mm2 reference point shall support a capability allowing the OSS to create managed object instances representing mobile edge application instances in the mobile edge platform manager.

REQ-MM2-MEA-CM-2: The Mm2 reference point shall support a capability allowing the OSS to delete managed object instances representing mobile edge application instances in the mobile edge platform manager.

REQ-MM2-MEA-CM-3: The Mm2 reference point shall support a capability allowing the OSS to activate and deactivate the DNS rules related to a certain mobile edge application instance.

REQ-MM2-MEA-CM-4: The Mm2 reference point shall support a capability allowing the OSS to activate and deactivate the traffic rules related to a certain mobile edge application instance.

REQ-MM2-MEA-CM-5: The Mm2 reference point shall support a capability allowing the mobile edge platform manager to notify changes of managed object instances representing mobile edge application instances to the OSS.

REQ-MM2-MEA-CM-6: The Mm2 reference point shall support a capability allowing the mobile edge platform manager to notify object creation and deletion events of managed object instances representing mobile edge application instances to the OSS.

NOTE: The configuration management of the application functionality as such is out of scope.

5.1.1.2.2 State Management requirements

REQ-MM2-MEA-SM-1: The Mm2 reference point shall support a capability allowing the mobile edge platform manager to expose the operational state of instantiated mobile edge applications to the OSS.

6 Information flows

6.1 Configuration management flows

6.1.1 Creation and deletion of managed objects representing application instances

There are two ways for the creation and deletion of managed objects representing application instances:

1) The managed object instances representing on Mm2 application instances are created and deleted automatically by the MEPM. MEPM sends automatically object creation/deletion notifications to the OSS carrying the application instance identifier.

2) The managed object instances representing on Mm2 application instances are created and deleted by the OSS.

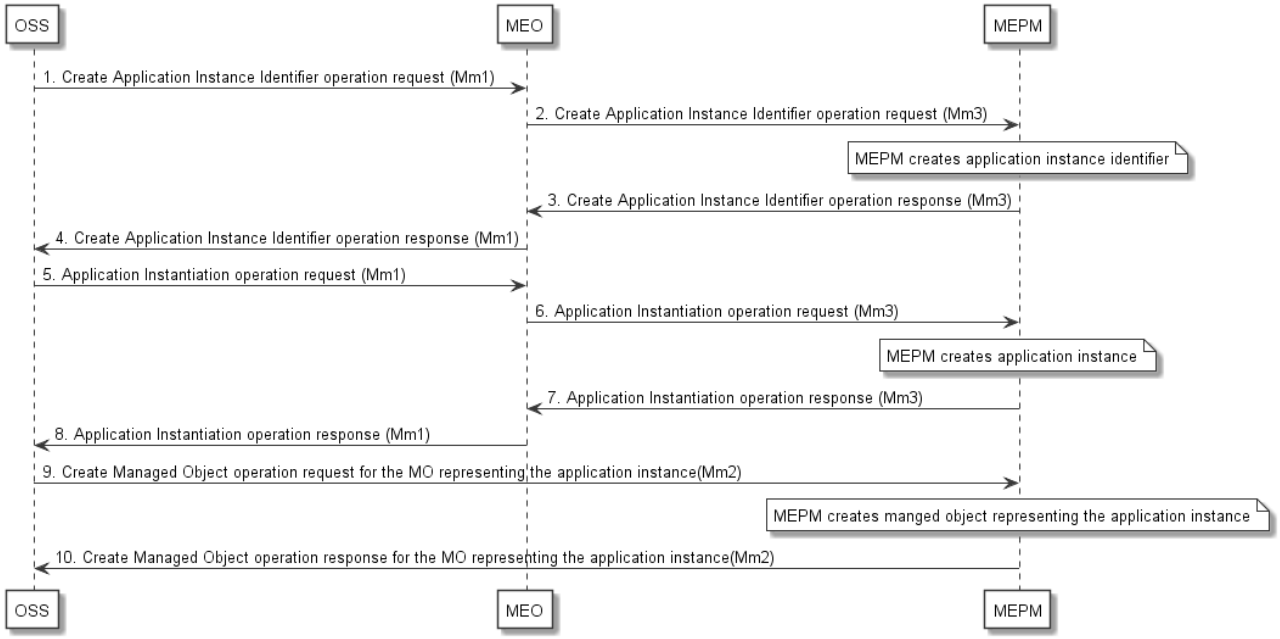


Figure 6.1.1-1: Managed object creation by the OSS flow

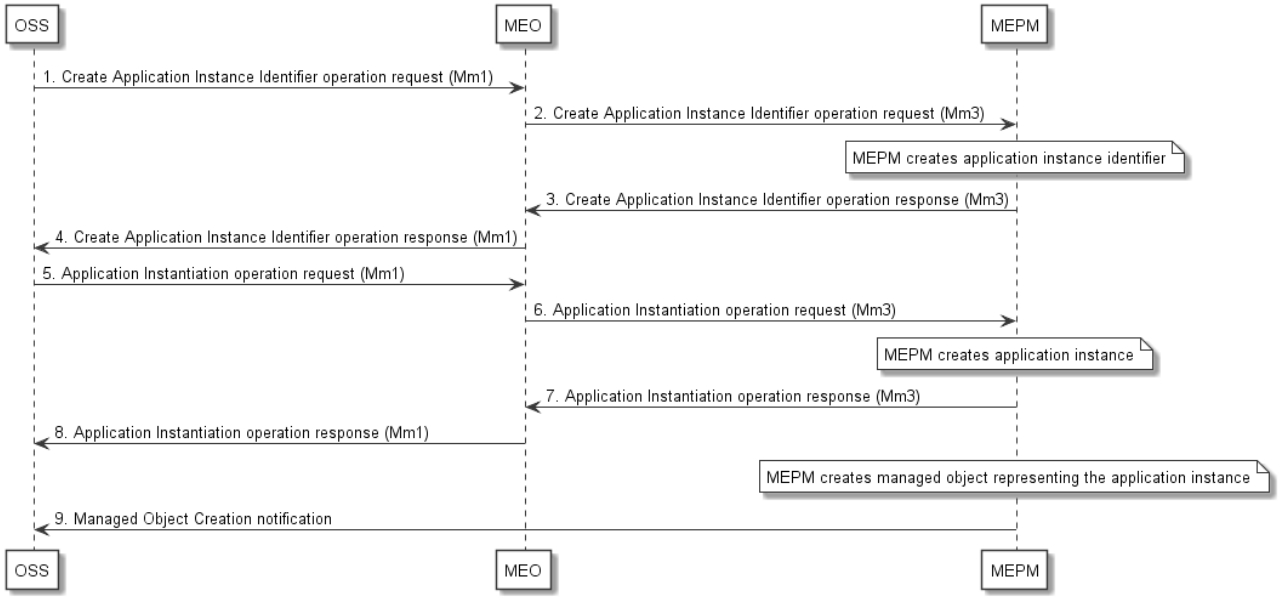


Figure 6.1.1-2: Managed object creation by the MEPM flow

6.1.2 Configuration of DNS rules

The DNS rules can be configured by the NM.

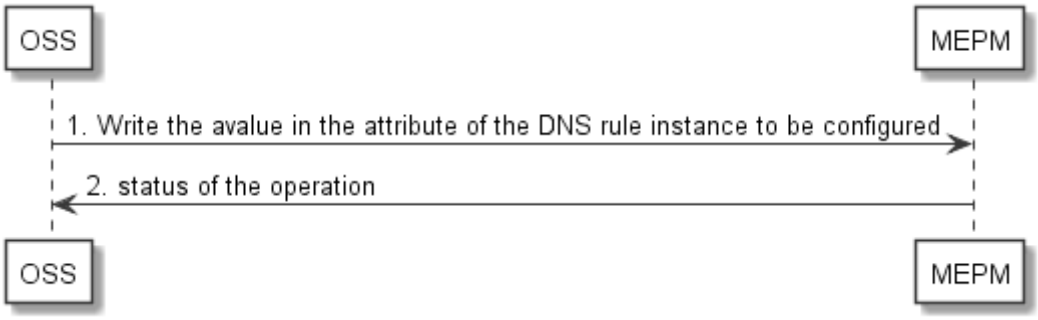


Figure 6.1.2-1: Configuration of DNS rules flow

The configuration procedure is as follows:

1) The NM sends a request to the MEPM to configure the DNS rule. This is done by writing the value in the attribute of the DNS rule to be configured.

2) The MEPM indicates in the response the status of the operation.

6.1.3 Activation of DNS rules

The DNS rules serving a particular application instance can be activated by the NM.

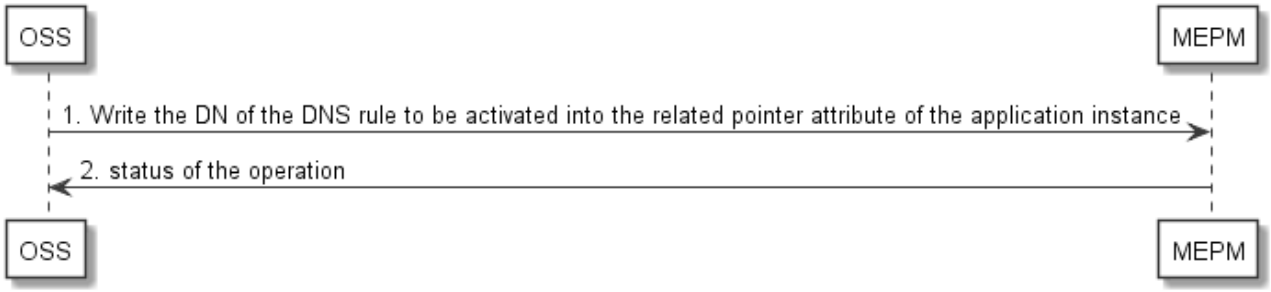


Figure 6.1.3-1: Activation and deactivation of DNS rules flow

The activation procedure is as follows:

1) The NM sends a request to the MEPM to activate a DNS rule for a specific application instance. This is done by configuring the DN of the DNS rule to be activated into the pointer attribute of the application instance.

2) The MEPM indicates in the response the status of the operation.

6.1.4 Deactivation of DNS rules

The DNS rules serving a particular application instance can be deactivated by the NM.

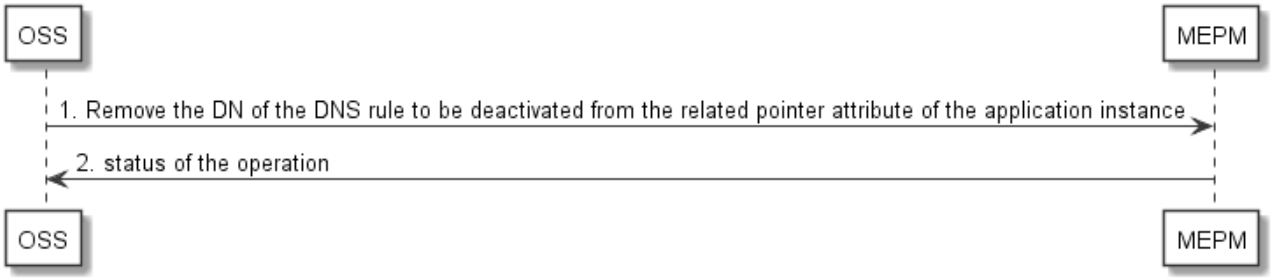


Figure 6.1.4-1: Flow: deactivation of DNS rules

The deactivation procedure is as follow:

1) The NM sends a request to the MEPM to deactivate a DNS rule for a specific application instance. This is done by removing the DN of the DNS rule to be deactivated from the pointer attribute of the application instance.

6.1.5 Configuration of traffic rules

Same as clause 6.1.2.

6.1.6 Activation of traffic rules

Same as clause 6.1.3.

6.1.7 Deactivation of traffic rules

Same as clause 6.1.4.

6.2 Fault management flows

The functionality is given by the Alarm IRP as specified in ETSI TS 132 111-2 [4].

7 Information models and interfaces

7.1 Applicable reference points

Table 7.1-1

	Mm1	Mm2		
Mobile edge host information model	--	X		
Fault Management interface	--	X		
Configuration Management interface (active part)	--	X		
Configuration Management interface (passive part)	--	X		

7.2 Information models

7.2.1 Mobile edge host information model

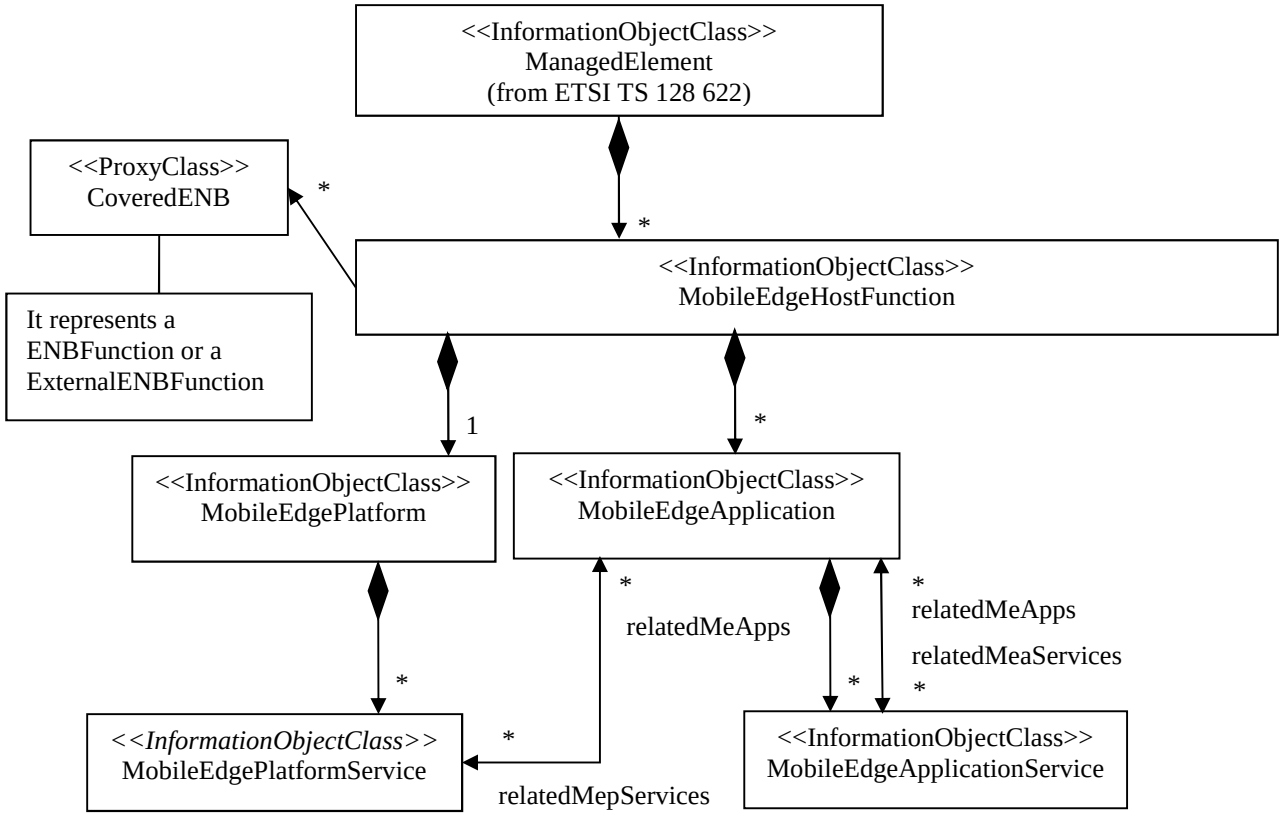
7.2.1.1 Imported information entities and local labels

Table 7.2.1.1-1

Label reference	Local label
ETSI TS 128 622 [6], IOC, `ManagedElement`	`ManagedElement`
ETSI TS 128 622 [6], IOC, `ManagedFunction`	`ManagedFunction`

7.2.1.2 Class diagram

7.2.1.2.1 Relationships



NOTE 1: A service producing `MobileEdgeApplication` instance contains at least one `MobileEdgeApplicationService` instance. A non-service producing `MobileEdgeApplication` instance does not contain any `MobileEdgeApplicationService` instances.

NOTE 2: A service producing `MobileEdgeApplication` instance containing a `MobileEdgeApplicationService` instance cannot have a relationship with that `MobileEdgeApplicationService` instance.

Figure 7.2.1.2.1-1: Information Model of the Mobile Edge Host - Part 1

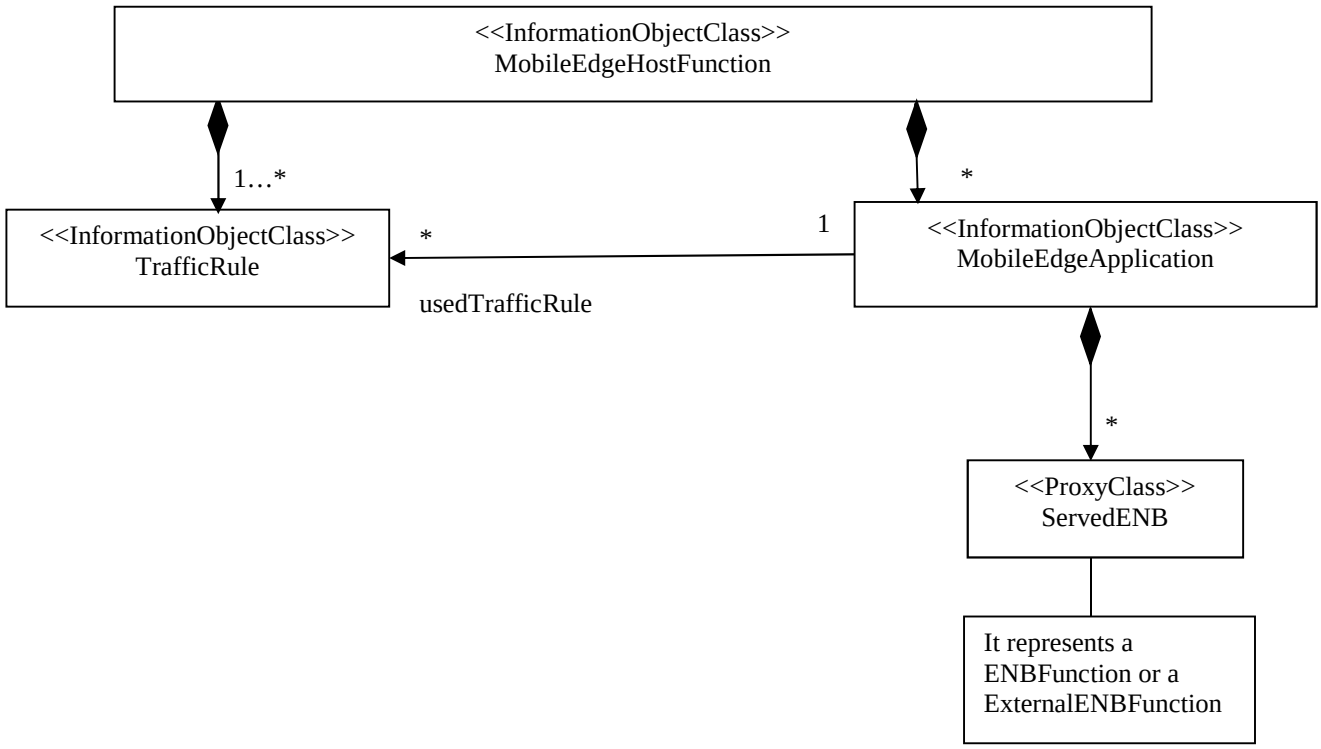


Figure 7.2.1.2.1-2: Information Model of the Mobile Edge Host - Part 2

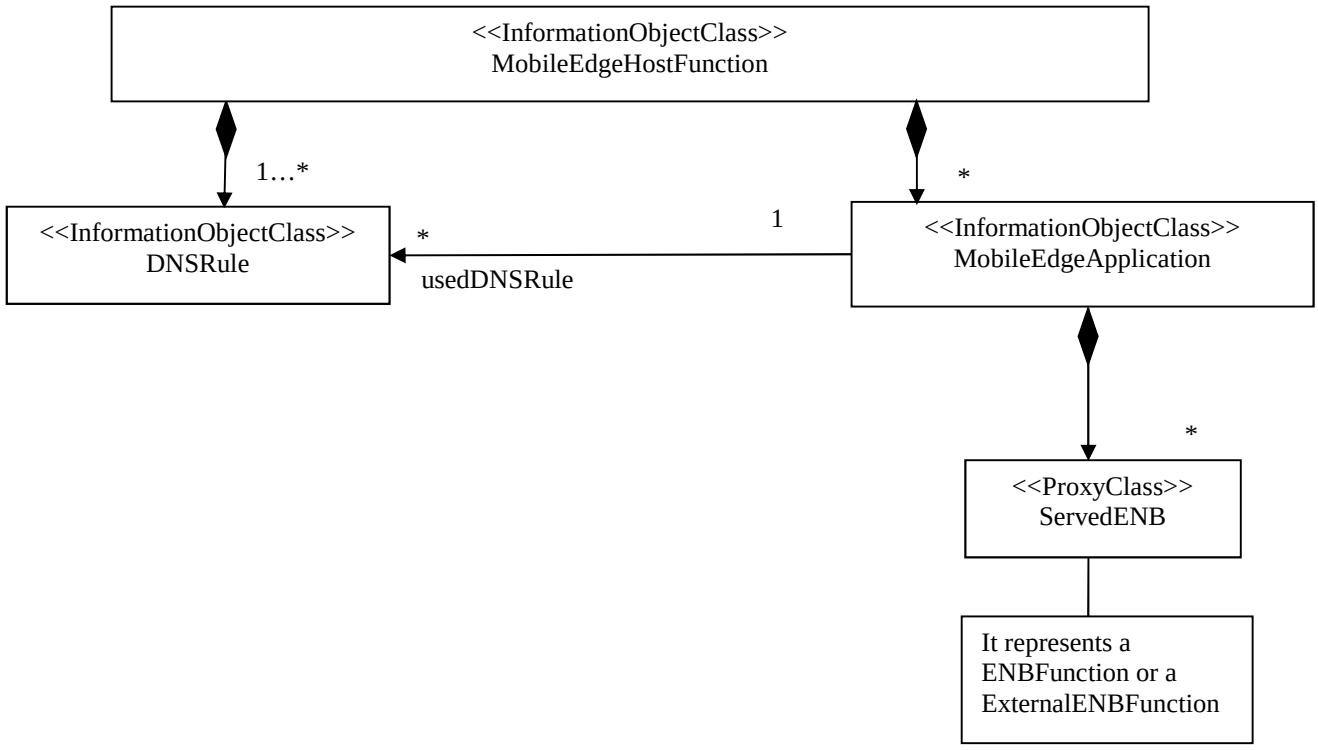


Figure 7.2.1.2.1-3: Information Model of the Mobile Edge Host - Part 3

7.2.1.2.2 Inheritance

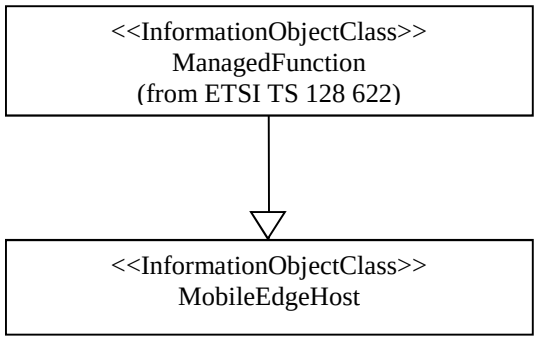


Figure 7.2.1.2.2-1: Inheritance hierarchy - Part 1

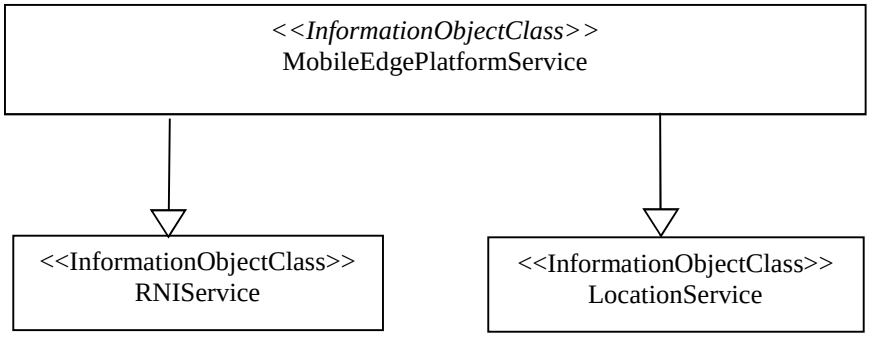


Figure 7.2.1.2.2-2: Inheritance hierarchy - Part 2

7.2.1.3 Information Object Class definitions

7.2.1.3.1 `CoveredENB`

7.2.1.3.1.1 Definition

This Proxy Object Class represents an eNB that can be served by a `MobileEdgeApplication` in the `MobilEdgeHost`.

7.2.1.3.1.2 Attributes

Attribute name	Support Qualifier	isReadable	isWritable	isInvariant	isNotifyable
`eNBId`	M	M	M	-	M

7.2.1.3.1.3 Attribute constraints

None.

7.2.1.3.1.4 Notifications

The common notifications defined in clause 7.2.1.5 are valid for this Information Object Class, without exceptions or additions.

7.2.1.3.2 ServedENB

7.2.1.3.2.1 Definition

This Proxy Object Class represents an eNB that is served by the related MobileEdgeApplication in the MobilEdgeHost. The ServedENB instances may or may not be a subset of the CoveredENB instances.

7.2.1.3.2.2 Attributes

Attribute name	Support Qualifier	isReadable	isWritable	isInvariant	isNotifyable
eNBId	M	M	M	-	M

7.2.1.3.2.3 Attribute constraints

None.

7.2.1.3.2.4 Notifications

The common notifications defined in clause 7.2.1.5 are valid for this Information Object Class, without exceptions or additions.

7.2.1.3.3 MobileEdgeHostFunction

7.2.1.3.3.1 Definition

This Information Object Class represents a mobile edge host function.

7.2.1.3.3.2 Attributes

Attribute name	Support Qualifier	isReadable	isWritable	isInvariant	isNotifyable
supportedFeatures	M	M	-	-	M
version	M	M	-	-	M

7.2.1.3.3.3 Attribute constraints

None.

7.2.1.3.3.4 Notifications

The common notifications defined in clause 7.2.1.5 are valid for this Information Object Class, without exceptions or additions.

7.2.1.3.4 MobileEdgePlatform

7.2.1.3.4.1 Definition

This Information Object Class represents a mobile edge platform.

7.2.1.3.4.2 Attributes

Attribute name	Support Qualifier	isReadable	isWritable	isInvariant	isNotifyable

7.2.1.3.4.3 Attribute constraints

None.

7.2.1.3.4.4 Notifications

The common notifications defined in clause 7.2.1.5 are valid for this Information Object Class, without exceptions or additions.

7.2.1.3.5 `MobileEdgeApplication`

7.2.1.3.5.1 Definition

This Information Object Class represents a mobile edge platform.

7.2.1.3.5.2 Attributes

Attribute name	Support Qualifier	isReadable	isWritable	isInvariant	isNotifyable
`appDId`	M	M	-	-	M
`appName`	M	M	-	-	M
`appProvider`	M	M	-	-	M
`appSoftVersion`	M	M	-	-	M
`appDVersion`	M	M	-	-	M
`appInfoName`	M	M	-	-	M
`appDescription`	M	M	-	-	M
`appState`	M	M	-	-	M
`instantiationState`	M	M	-	-	M
`operationalState`	M	M	-	-	M
`appInstanceId`	M	M	-	-	M

7.2.1.3.5.3 Attribute constraints

None.

7.2.1.3.5.4 Notifications

The common notifications defined in clause 7.2.1.5 are valid for this Information Object Class, without exceptions or additions.

7.2.1.3.5.5 State diagram

Applications have three states: `instantiationState`, `appState`, `operationalState`. The state diagram is shown in figure 7.2.1.3.5.5-1. Four different state combinations are possible.

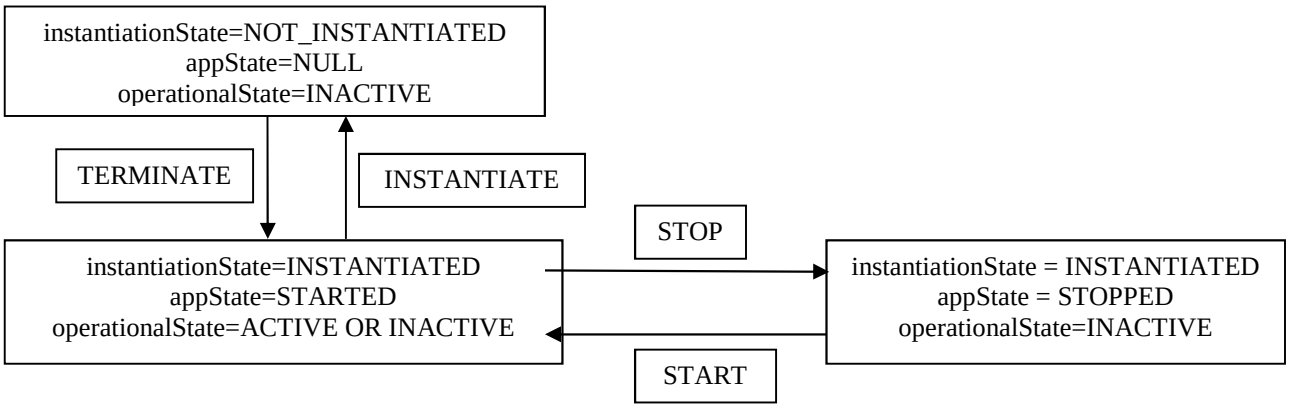


Figure 7.2.1.3.5.5-1: State diagram

7.2.1.3.6 MobileEdgePlatformService

7.2.1.3.6.1 Definition

This abstract Information Object Class represents a mobile edge service provided by the mobile edge platform.

7.2.1.3.6.2 Attributes

Attribute name	Support Qualifier	isReadable	isWritable	isInvariant	isNotifyable
address	M	M	-	-	M
operationalState	M	M	-	-	M
serName	M	M	-	-	M
serCategory	M	M	-	-	M
serVersion	M	M	-	-	M
serDataFormat	M	M	-	-	M

7.2.1.3.6.3 Attribute constraints

None.

7.2.1.3.6.4 Notifications

The common notifications defined in clause 7.2.1.5 are valid for this Information Object Class, without exceptions or additions.

7.2.1.3.7 MobileEdgeApplicationService

7.2.1.3.7.1 Definition

This Information Object Class represents a mobile edge service provided by a mobile edge application.

7.2.1.3.7.2 Attributes

Attribute name	Support Qualifier	isReadable	isWritable	isInvariant	isNotifyable
address	M	M	-	-	M
operationalState	M	M	-	-	M
serName	M	M	-	-	M
serCategory	M	M	-	-	M
serVersion	M	M	-	-	M
transportsSupported	M	M	-	-	M

7.2.1.3.7.3 Attribute constraints

None.

7.2.1.3.7.4 Notifications

The common notifications defined in clause 7.2.1.5 are valid for this Information Object Class, without exceptions or additions.

7.2.1.3.8 RNIService

7.2.1.3.8.1 Definition

This Information Object Class represents a radio network information service.

NOTE: This IOC does not have attributes in Phase 1.

7.2.1.3.8.2 Attributes

Attribute name	Support Qualifier	isReadable	isWritable	isInvariant	isNotifyable

7.2.1.3.8.3 Attribute constraints

None.

7.2.1.3.8.4 Notifications

The common notifications defined in clause 7.2.1.5 are valid for this Information Object Class, without exceptions or additions.

7.2.1.3.9 `LocationService`

7.2.1.3.9.1 Definition

This Information Object Class represents a location service.

NOTE: This IOC does not have attributes in Phase 1.

7.2.1.3.9.2 Attributes

Attribute name	Support Qualifier	isReadable	isWritable	isInvariant	isNotifyable

7.2.1.3.9.3 Attribute constraints

None.

7.2.1.3.9.4 Notifications

The common notifications defined in clause 7.2.1.5 are valid for this Information Object Class, without exceptions or additions.

7.2.1.3.10 `TrafficRule`

7.2.1.3.10.1 Definition

This Information Object Class represents a filter rule, specifying which IP packets shall be redirected to the associated application.

Each instance of `MobilEdgeApplication` has a relationship to zero or many instances of `TrafficRule`. The relationship does exist only for rules that are active regarding the `MobilEdgeApplication` instance. A relationship to inactive rules does not exist.

7.2.1.3.10.2 Attributes

Attribute name	Support Qualifier	isReadable	isWritable	isInvariant	isNotifyable
`trafficRuleId`	M	M	M	-	M
`filterType`	M	M	M	-	M
`priority`	M	M	M	-	M
`trafficFilter`	M	M	M	-	M
`action`	M	M	M	-	M
`dstInterface`	M	M	M	-	M

7.2.1.3.10.3 Attribute constraints

None.

7.2.1.3.10.4 Notifications

The common notifications defined in clause 7.2.1.5 are valid for this Information Object Class, without exceptions or additions.

7.2.1.3.11 DNSRule

7.2.1.3.11.1 Definition

This Information Object Class represents DNS rules, specifying which IP packets shall be redirected to an MobileEdgeApplication.

Each instance of MobilEdgeApplication has a relationship to zero or many instances of DNSRule. The relationship does exist only for rules that are active regarding the MobilEdgeApplication instance. A relationship to inactive rules regarding the MobilEdgeApplication instance does not exist. DNS rules without any relationship are completely inactive.

7.2.1.3.11.2 Attributes

Attribute name	Support Qualifier	isReadable	isWritable	isInvariant	isNotifyable
dnsRuleId	M	M	M	-	M
domainName	M	M	M	-	M
iPAddressType	M	M	M	-	M
iPAddress	M	M	M	-	M
timeToLive	O	M	M	-	M

7.2.1.3.11.3 Attribute constraints

None.

7.2.1.3.11.4 Notifications

The common notifications defined in clause 7.2.1.5 are valid for this Information Object Class, without exceptions or additions.

7.2.1.4 Attribute definitions

Attribute Name	Documentation and Allowed Values	Properties
action	The action to be applied to a packet in case it matches the traffic rule or RAB filter rule, the same as the attribute priority of the TrafficRuleDescriptor information element (table 6.2.1.9.2-1 in ETSI GS MEC 010-2 [8]). allowedValues: DROP, FORWARD, DECAPSULATED, FORWARD_AS_IS, PASSTHROUGH, DUPLICATED_DECAPSULATED, DUPLICATE_AS_IS	type: Enumerated multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: False
address	The IP address where mobile edge services can be accessed. allowedValues: N/A.	type: String multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: False
appDescription	Human readable description of the mobile edge application, the same as the attribute appId of the AppD information element (table 7.2.2.2-1 in ETSI GS MEC 010-2 [8]). allowedValues: N/A.	type: String multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: False

Attribute Name	Documentation and Allowed Values	Properties
appDId	Identifier of the mobile edge application descriptor, the same as the attribute appDId of the AppD information element (table 7.2.2.2-1 in ETSI GS MEC 010-2 [8]). allowedValues: N/A.	type: String multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: False
appDVersion	Identifies the version of the application descriptor, the same as the attribute appDVersion of the AppD information element (table 7.2.2.2-1 in ETSI GS MEC 010-2 [8]). allowedValues: N/A.	type: String multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: False
appInfoName	Human readable name for the application product, it can change during the application product lifetime, the same as the attribute appInfoName of the AppD information element (table 7.2.2.2-1 in ETSI GS MEC 010-2 [8]). allowedValues: N/A.	type: String multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: False
appInstanceId	Application instance identifier. allowedValues: N/A.	type: String multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: True
appName	Human readable name of the mobile edge application, the same as the attribute appName of the AppD information element (table 7.2.2.2-1 in ETSI GS MEC 010-2 [8]). allowedValues: N/A.	type: String multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: False
appProvider	Provider of the mobile edge application, the same as the attribute appProvider of the AppD information element (table 7.2.2.2-1 in ETSI GS MEC 010-2 [8]). allowedValues: N/A.	type: String multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: False
appSoftVersion	Version of the mobile edge application, the same as the attribute appSoftVersion of the AppD information element (table 7.2.2.2-1 in ETSI GS MEC 010-2 [8]). allowedValues: N/A.	type: String multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: False
appState	The state of the application. allowedValues: STARTED, STOPPED.	type: String multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: TRUE
dnsRuleId	The DNS rule id, the same as the attribute dnsRuleId of the DnsRuleDescriptor information element (table 6.2.1.13.2-1 in ETSI GS MEC 010-2 [8]). allowedValues: N/A.	
domainName	The FQDN of the DNS rule, the same as the attribute domainName of the DnsRuleDescriptor information element (table 6.2.1.13.2-1 in ETSI GS MEC 010-2 [8]). allowedValues: N/A.	type: String multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: FALSE
eNBId	Unambiguously identifies an eNodeB within a PLMN. allowedValues: See ETSI TS 136 413 [9], ETSI TS 136 300 [7].	type: Integer multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: True

Attribute Name	Documentation and Allowed Values	Properties
filterType	Definition of filter type, the same as the attribute priority of the TrafficRuleDescriptor information element (table 6.2.1.9.2-1 in ETSI GS MEC 010-2 [8]). allowedValues: FLOW, PACKET	type:Enumerated multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: False
instantiationState	The instantiation state of the application. allowedValues: NOT_INSTANTIATED, INSTANTIATED.	type: String multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: FALSE
iPAddress	The IP address to which the domain name is resolved. allowedValues: N/A.	type: String multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: FALSE
iPAddressType	The IP address type, the same as the attribute iPAddressType of the DnsRuleDescriptor information element (table 6.2.1.13.2-1 in ETSI GS MEC 010-2 [8]). allowedValues: IPv4, IPv6.	type:Enumerated multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: False
nWIpAdress	The IP address of the network. allowedValues: N/A.	type: String multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: True
nWSubNetMask	The sub network mask of the network. allowedValues: N/A.	type: String multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: True
operationalState	It indicates the operational state of the object instance. This attribute is READ-ONLY. allowedValues:ACTIVE, INACTIVE.	type:Enumerated multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: False
priority	The priority of the associated traffic rule, the same as the attribute priority of the TrafficRuleDescriptor information element (table 6.2.1.9.2-1 in ETSI GS MEC 010-2 [8]). If traffic rule conflicts, the one with higher priority take precedence. allowedValues: N/A.	type: Integer multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: True
serCategory	The category of the service, the same as the attribute serCategory of the ServiceDescriptor information element (table 6.2.1.7.2-1 in ETSI GS MEC 010-2 [8]). allowedValues: N/A.	type: String multiplicity: 0…* isOrdered: N/A isUnique: N/A defaultValue: None isNullable: False
serName	The name of the service, the same as the attribute serName of the ServiceDescriptor information element (table 6.2.1.7.2-1 in ETSI GS MEC 010-2 [8]). allowedValues: N/A.	type: String multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: False
serVersion	The version of the service, the same as the attribute version of the ServiceDescriptor information element (table 6.2.1.7.2-1 in ETSI GS MEC 010-2 [8]). allowedValues: N/A.	type: String multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: False

Attribute Name	Documentation and Allowed Values	Properties
supportedFeatures	The features supported by the MobileEdgeHostFunction. allowedValues: The value {None}, or any combination of {UserApps, SmartRelocation, RadioNetworkInformation, LocationService, BandwidthManager, UEIdentity}.	type: String multiplicity: 1…6 isOrdered: False isUnique: True defaultValue: None isNullable: True
timeToLive	The time to life of the resolved IP address, the same as the attribute timeToLive of the DnsRuleDescriptor information element (table 6.2.1.13.2-1 in ETSI GS MEC 010-2 [8]). allowedValues: N/A.	type: Integer multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: False
trafficFilter	The traffic filter used to identify specific flow/packets that need to be handled by the MEC host, the same as the attribute trafficFilter of the TrafficRuleDescriptor information element (table 6.2.1.9.2-1 in ETSI GS MEC 010-2 [8]). allowedValues: N/A.	type: STRUCT multiplicity: 1…* isOrdered: N/A isUnique: N/A defaultValue: None isNullable: False
trafficRuleId	The identifier of the traffic rule. allowedValues: N/A.	type: String multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: False
transportsSupported	Indicates transports and serialization formats supported made available to the service-consuming application, the same as the attribute transportsSupported of the ServiceDescriptor information element (table 6.2.1.7.2-1 in ETSI GS MEC 010-2 [8]). allowedValues: N/A.	type: STRUCT multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: False
uEIpAdress	The IP address of the UE. allowedValues: N/A.	type: String multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: True
uESubNetMask	The sub network mask of the UE. allowedValues: N/A.	type: String multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: True
version	Version of the MEC system. allowedValues: N/A.	type: String multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: False
Attribute related to a role		
relatedMepServices	The mobile edge platform services related to a mobile edge application, i.e. the services used by a mobile edge application. allowedValues: N/A.	type: DN multiplicity: 0..* isOrdered: N/A isUnique: N/A defaultValue: None isNullable: True
relatedMeaServices	The mobile edge application services related to a mobile edge application, i.e. the services used by a mobile edge application. allowedValues: N/A.	type: DN multiplicity: 0..* isOrdered: N/A isUnique: N/A defaultValue: None isNullable: True
usedDNSRule	The DNSRule used by a MobileEdgeApplication. allowedValues: N/A.	type: DN multiplicity: 0..* isOrdered: N/A isUnique: N/A defaultValue: None isNullable: True

Attribute Name	Documentation and Allowed Values	Properties
usedTrafficRule	The TrafficRule used by a MobileEdgeApplication. allowedValues: N/A.	type: DN multiplicity: 0..* isOrdered: N/A isUnique: N/A defaultValue: None isNullable: True
usedRABFilterRule	The RABFilterRule used by a MobileEdgeApplication. allowedValues: N/A.	type: DN multiplicity: 0..* isOrdered: N/A isUnique: N/A defaultValue: None isNullable: True
relatedMeApps	The mobile edge applications related to a mobile edge platform service or a mobile edge application service, i.e. the applications using a mobile edge service. allowedValues: N/A.	type: DN multiplicity: 0..* isOrdered: N/A isUnique: N/A defaultValue: None isNullable: True

7.2.1.5 Common notifications

7.2.1.5.1 Alarm notifications

This clause presents a list of notifications, defined in ETSI TS 132 111-2 [4], that IRPManager can receive. The notification header attribute objectClass/objectInstance, defined in ETSI TS 132 302 [1], would capture the DN of an instance of an IOC defined in this IRP specification.

Name	Qualifier	Notes
notifyAckStateChanged	See Alarm IRP (ETSI TS 132 111-2 [4])	
notifyChangedAlarm	See Alarm IRP (ETSI TS 132 111-2 [4])	
notifyClearedAlarm	See Alarm IRP (ETSI TS 132 111-2 [4])	
notifyNewAlarm	See Alarm IRP (ETSI TS 132 111-2 [4])	
notifyComments	See Alarm IRP (ETSI TS 132 111-2 [4])	
notifyAlarmListRebuilt	See Alarm IRP (ETSI TS 132 111-2 [4])	
notifyPotentialFaultyAlarmList	See Alarm IRP (ETSI TS 132 111-2 [4])	

7.2.1.5.2 Configuration notifications

This clause presents a list of notifications, defined in ETSI TS 132 662 [3], that IRPManager can receive. The notification header attribute objectClass/objectInstance, defined in ETSI TS 132 302 [1], would capture the DN of an instance of an IOC defined in this IRP specification.

Name	Qualifier	Notes
notifyAttributeValueChange	O	
notifyObjectCreation	O	
notifyObjectDeletion	O	

7.3 Interfaces

7.3.1 Fault Management interface

For Alarm Management, the following 3GPP defined IRPs are used:

- ETSI TS 132 111-2 [4]: "Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); LTE; Telecommunication management; Fault Management; Part 2: Alarm Integration Reference Point (IRP): Information Service (IS) (3GPP TS 32.111-2)".
- ETSI TS 132 332 [5]: "Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); LTE; Telecommunication management; Notification Log (NL) Integration Reference Point (IRP); Information Service (IS) (3GPP TS 32.332)".

7.3.2 Configuration Management interface (passive part)

For Configuration Management (passive part), the following 3GPP defined IRPs are used:

- ETSI TS 132 662 [3]: "Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); LTE; Telecommunication management; Configuration Management (CM); Kernel CM Information Service (IS) (3GPP TS 32.662)".
- ETSI TS 132 332 [5]: "Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); LTE; Telecommunication management; Notification Log (NL) Integration Reference Point (IRP); Information Service (IS) (3GPP TS 32.332)".

7.3.3 Configuration Management interface (active part)

For Configuration Management (active part), the following 3GPP defined IRPs are used:

- ETSI TS 132 602 [2]: "Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); LTE; Telecommunication management; Configuration Management (CM); Basic CM Integration Reference Point (IRP); Information Service (IS) (3GPP TS 32.602)".

8 Data models and interface protocols

8.1 Data models

Data models are not part of Phase 1.

8.2 Interface protocols

Interface protocols are not part of Phase 1.

History

Document history		
V1.1.1	October 2017	Publication