**3GPP TSG-SA5 Meeting #143-e *S5-223858***

**e-meeting, 9 - 17 May 2022**

|  |
| --- |
| *CR-Form-v12.1* |
| **CHANGE REQUEST** |
|  |
|  | **28.538** | **CR** | **Draft CR** | **rev** | **-** | **Current version:** | **17.0.0** |  |
|  |
| *For* [***HE******LP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* |
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|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ***Proposed change affects:*** | UICC apps |  | ME |  | Radio Access Network | **X** | Core Network | **X** |

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|  |
| ***Title:***  | Rel-18 DraftCR 28.538 for eECM |
|  |  |
| ***Source to WG:*** | Samsung |
| ***Source to TSG:*** | SA5 |
|  |  |
| ***Work item code:*** | eECM |  | ***Date:*** | 2022-04-14 |
|  |  |  |  |  |
| ***Category:*** | **B** |  | ***Release:*** | 17 |
|  | *Use one of the following categories:****F*** *(correction)****A*** *(mirror corresponding to a change in an earlier release)****B*** *(addition of feature),* ***C*** *(functional modification of feature)****D*** *(editorial modification)*Detailed explanations of the above categories canbe found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | *Use one of the following releases:Rel-8 (Release 8)Rel-9 (Release 9)Rel-10 (Release 10)Rel-11 (Release 11)…Rel-15 (Release 15)Rel-16 (Release 16)Rel-17 (Release 17)Rel-18 (Release 18)* |
|  |  |
| ***Reason for change:*** | DraftCR for eECM |
|  |  |
| ***Summary of change:*** | This draftCR includes inputs from the following contributions1. S5-225842 Rel-18 InputToDraftCR 28.538 EAS Profile.doc
2. S5-225846 Rel-18 InputToDraftCR 28.538 Availability Zone.doc
3. S5-225847 Rel-18 InputToDraftCR 28.538 GSMA OP and ECM concept mapping
 |
|  |  |
| ***Consequences if not approved:*** | The WI eECM cannot progress. |
|  |  |
| ***Clauses affected:*** | 2, 3, 6.2.2, 6.3.1, 6.3.x(new), 6.3.c(new), 6.4.1, Annex B (new) |
|  |  |
|  | **Y** | **N** |  |  |
| ***Other specs*** |  | **X** |  Other core specifications  | TS/TR ... CR ...  |
| ***affected:*** |  | **X** |  Test specifications | TS/TR ... CR ...  |
| ***(show related CRs)*** |  | **X** |  O&M Specifications | TS/TR ... CR ...  |
|  |  |
| ***Other comments:*** |  |
|  |  |
| ***This CR's revision history:*** |  |

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| **First modification** |

# 2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non‑specific.

- For a specific reference, subsequent revisions do not apply.

- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

[1] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications".

[2] 3GPP TS 23.558: "Architecture for enabling Edge Applications".

[3] 3GPP TS 28.541: "Management and orchestration; 5G Network Resource Model (NRM); Stage 2 and stage 3".

[4] 3GPP TS 28.622: "Telecommunication management; Generic Network Resource Model (NRM) Integration Reference Point (IRP); Information Service (IS)".

[5] 3GPP TS 28.532: "Management and orchestration; Generic management services".

[6] ETSI GS NFV-IFA 013 V3.4.1 "Network Functions Virtualisation (NFV) Release 3; Management and Orchestration; Os-Ma-nfvo reference point -Interface and Information Model Specification".

[7] ETSI GS NFV-IFA 011 (V3.3.1): "Network Functions Virtualisation (NFV) Release 3; Management and Orchestration; VNF Descriptor and Packaging Specification".

[8] 3GPP TS 28.550: "Management and orchestration; Performance assurance".

[9] 3GPP TS 28.531: "Management and orchestration; Provisioning".

[10] 3GPP TS 28.552: "Management and orchestration; 5G performance measurements".

[11] 3GPP TS 23.501: "System architecture for the 5G System (5GS); Stage 2".

[12] 3GPP TS 28.658: "Telecommunications management; Evolved Universal Terrestrial Radio Access Network (E-UTRAN) Network Resource Model (NRM) Integration Reference Point (IRP): Information Service (IS)".

[13] 3GPP TS 38.300: "NR; Overall description; Stage-2".

[14] GSMA OPG: “Operator Platform Telco Edge Requirements”

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| **Next modification** |

# 3 Definitions of terms, symbols and abbreviations

## 3.1 Terms

For the purposes of the present document, the terms given in 3GPP TR 21.905 [1] and the following apply. A term defined in the present document takes precedence over the definition of the same term, if any, in 3GPP TR 21.905 [1].

**Edge Computing:** A concept, as described in 3GPP TS 23.501 [4], that enables operator and 3rd party services to be hosted close to the UE's access point of attachment, to achieve an efficient service delivery through the reduced end-to-end latency and load on the transport network.

**Edge Computing Service Provider:** A mobile network operator offering Edge Computing service.

**Edge Data Network:** A local Data Network that supports the architecture for enabling edge applications.

**ECSP Management System**: is a part of 3GPP management system that utilizes 3GPP defined management services to enable consumers (e.g., ASP. ECSP) to orchestrate and manage the EDN.

**PLMN Management System**: is a part of 3GPP Management System that utilizes 3GPP defined management services to enable consumers (e.g., PLMN operator) to orchestrate and manage the mobile networks.

**Availability Zone:** Refer to GSMA Operator Platfrom Telco Edge Requirements [14]

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| **Next modification** |

### 6.2.2 Inheritance

 

Figure 6.2.2-2: EASProfile Inheritance

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| **Next modification** |

### 6.3.x EASProfile

#### 6.3.x.1 Definition

This IOC represent an EASProfile, see 3GPP TS 23.558. This IOC will be instaniated with the instantiation of every EASFunction IOC.

#### 6.3.x.2 Attributes

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Support Qualifier | isReadable | isWritable | isInvariant | isNotifyable |
| eASIdentifier | M | T | F | F | T |
| eEASEndpoint | M | T | F | F | T |
| aCID | O | T | F | F | T |
| eASProvider | O | T | F | F | T |
|  |  |  |  |  |  |
| eASdescription | O | T | F | F | T |
| eASSchedule | O | T | F | F | T |
| eASGeographicalServiceArea | O | T | F | F | T |
| eASTopologicalServiceArea | O | T | F | F | T |
| eAServiceKPIs | O | T | F | F | T |
| eASServicePermissionLevel | O | T | F | F | T |
| eASFeature | O | T | F | F | T |
| eASServiceContinuitySupport | O | T | F | F | T |
| eASDNAI | O | T | F | F | T |
| eASAvailabilityReportingPeriod | O | T | F | F | T |
| eASStatus | O | T | F | F | T |

#### 6.3.x.3 Attribute constraints

None.

#### 6.3.x.4 Notifications

The common notifications defined in subclause 5.5 of 3GPP TS 28.541 [3] are valid for this IOC, without exceptions or additions.

6.3.C Duration <<dataType>>

6.3.C.1 Definition

This data type defines a time duration.

6.3.C.2 Attributes

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute name** | **S** | **isReadable** | **isWritable** | **isInvariant** | **isNotifyable** |
| startTime | M | T | T | T | T |
| endTime | M | T | T | T | T |

6.3.C.3 Attribute constraints

None.

6.3.C.4 Notifications

The clause 5.5, in TS 28.541[3], of the <<IOC>> using this <<dataType>> as one of its attributes, shall be applicable.

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| **Next modification** |

## 6.4 Attribute definition

### 6.4.1 Attribute Properties

Editor's Note: The definition of attributes are not complete, and are subject to changes.

| Attribute Name | Documentation and Allowed Values | Properties |
| --- | --- | --- |
| eASIdentifier | It refers to EASID that identifies a particular application (e.g. SA6Video, SA6Game, … etc.) (see clause 7.2.4 in TS 23.558 [2]). | type: Stringmultiplicity: 1isOrdered: N/AisUnique: TruedefaultValue: NoneisNullable: False |
| easAddress | One or more URLs and/or IP Address(es) of EAS(s) (See TS 23.558 [2]). allowedValues: N/A | type: Stringmultiplicity: 1..\*isOrdered: N/AisUnique: N/AdefaultValue: NoneallowedValues: N/AisNullable: False |
| eASREquirementsRef | This is the DN of EASRequirements. allowedValues: Not applicable | type: DNmultiplicity: 1isOrdered: N/AisUnique: TruedefaultValue: NoneisNullable: False |
| edgeDataNetworkRef | This holds a list of DN of EdgeDataNetwork. | type: DNmultiplicity: 1..\*isOrdered: N/AisUnique: TruedefaultValue: NoneisNullable: False |
| requiredEASservingLocation | It defines the location where the EAS service should be available (see clause 7.3.3.6 in TS 23.558 [2]). | type: ServingLocationmultiplicity: 1isOrdered: N/AisUnique: TruedefaultValue: NoneisNullable: False |
| geographicalLocation | This refers to the Geographical Service Area, (see clause 7.3.3.3 in TS 23.558 [2] that is defined as a datatype (see clause 6.3.4).allowedValues: N/A | type: GeoLocmultiplicity: 1isOrdered: N/AisUnique: TruedefaultValue: NoneisNullable: False |
| latitude | This defines the single latitude coordinate. | type: Floatmultiplicity: 1isOrdered: N/AisUnique: TruedefaultValue: NoneisNullable: False |
| longitude | This defines the single longitude coordinate. | type: Floatmultiplicity: 1isOrdered: N/AisUnique: TruedefaultValue: NoneisNullable: False |
| civicLocation | This defines the civic locations, such as: a well-known buildings, parks, arenas, civic addresses, or ZIP code etc (see clause 7.3.3.3 in TS 23.558 [2]). | type: Stringmultiplicity: 1isOrdered: N/AisUnique: TruedefaultValue: NoneisNullable: False |
| topologicalLocation | This refers to the Topological Service Area, (see clause 7.3.3.2 in TS 23.558 [2]) that is defined as a datatype (see clause 6.3.7). allowedValues: N/A | type: TopologicalServiceAreamultiplicity: 1isOrdered: N/AisUnique: TruedefaultValue: NoneisNullable: False |
| geographicalCoordinates | This refers to the Topological Service Area, (see clause 7.3.3.2 in TS 23.558 [2]) that is defined as a datatype (see clause 6.3.8). allowedValues: N/A | type: GeographicalCoordinatesmultiplicity: 1isOrdered: N/AisUnique: TruedefaultValue: NoneisNullable: False |
| softwareImageInfo | This refers to the software image information (e.g. software image location, minimum RAM, disk requirements) (see clause 7.1.6.5 in ETSI NFV IFA-011 [7]). It is defined as a datatype (see clause 6.3.9).allowedValues: N/A | type: SoftwareImageInfomultiplicity: 1isOrdered: N/AisUnique: TruedefaultValue: NoneisNullable: False |
| swImageRef | It indicates the reference to the actual software image that is represented by URL (see clause 7.1.6.5 in ETSI NFV IFA-011 [7]). | type: Stringmultiplicity: 1isOrdered: N/AisUnique: TruedefaultValue: NoneisNullable: False |
| minimumDisk | It indicates the minimum disk size requirement for the EAS software (see clause 7.1.6.5 in ETSI NFV IFA-011 [7]).The unit is Megabyte. | type: Integermultiplicity: 1isOrdered: N/AisUnique: TruedefaultValue: NoneisNullable: False |
| minimumRAM | It indicates the minimum RAM size requirement for the EAS software (see clause 7.1.6.5 in ETSI NFV IFA-011 [7]).The unit is Megabyte. | type: Integermultiplicity: 1isOrdered: N/AisUnique: TruedefaultValue: NoneisNullable: False |
| cellIDList | It represents the list of NR cells. The cell ID, together with the gNB Identifier (using gNBId of the parent GNBCUCPFunction or GNBDUFunction or ExternalCUCPFunction), identifies a NR cell within a PLMN. This is the NR Cell Identity (NCI). See subclause 8.2 of TS 38.300 [13]. AllowedValues: Not applicable | type: Integermultiplicity: \*isOrdered: N/AisUnique: YesdefaultValue: NoneisNullable: True |
| trackingAreaIdList | It represents the list of tracking areas within a PLMN.  | type: TAImultiplicity: 1..\*isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| servingPLMN | It specifies the PLMN to be served. | type: PLMNIdmultiplicity: 1isOrdered: FisUnique: N/AdefaultValue: NoneisNullable: True |
| ecsAddress | One or more URLs and/or IP Address(es) of ECS(s) (See TS 23.558 [2]). allowedValues: N/A | type: Stringmultiplicity: 1..\*isOrdered: N/AisUnique: N/AdefaultValue: NoneallowedValues: N/AisNullable: False |
| providerIdentifier | The identifier of the ECSP that provides the ECS (See TS 23.558 [2]).allowedValues: N/A | type: stringmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneallowedValues: N/AisNullable: False |
| eDNConnectionInfo | It defines the set of information needed to connect to an EDN. | type: EDNConnectionInfomultiplicity: 1..\*isOrdered: N/AisUnique: TruedefaultValue: NoneisNullable: False |
| eDNServiceArea | This parameter defines the service location for the EDN (see clause 7.3.3.4 in TS 23.558 [2]). | type: ServingLocationmultiplicity: 1isOrdered: N/AisUnique: TruedefaultValue: NoneisNullable: False |
| ednIdentifier | The identifier of the edge data network (See TS 23.558 [2]).allowedValues: N/A | type: stringmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneallowedValues: N/AisNullable: False |
| affinityAntiAffinity | This parameter defines the affinity and anti-requirements of the EAS with other EAS on the same EDN. | type: AffinityAntiAffinitymultiplicity: 1isOrdered: N/AisUnique: TruedefaultValue: NoneisNullable: False |
| affinityEAS | This parameter defines the EAS identifier with which the affinity is required. | type: Stringmultiplicity: 1...\*isOrdered: N/AisUnique: TruedefaultValue: NoneisNullable: False |
| antiAffinityEAS | This parameter defines the EAS identifier with which the anti-affinity is required. | type: Stringmultiplicity: 1...\*isOrdered: N/AisUnique: TruedefaultValue: NoneisNullable: False |
| serviceContinuity | This parameter defines if the service continuity is required by the EAS. If the value is TRUE, the EAS will be deployed with an EES supporting service continuity. | type: Booleanmultiplicity: 1...\*isOrdered: N/AisUnique: TruedefaultValue: FalseisNullable: False |
| virtualResource | This parameter defines the virtual resource requirements of an EAS. | type: VirtualResourcemultiplicity: 1isOrdered: N/AisUnique: TruedefaultValue: NoneisNullable: False |
| virtualMemory | It indicates the minimum virtual memory size requirements for EAS in megabytes. (see clause 7.1.9.3.2.2 in ETSI NFV IFA-011 [7]). | type: Integermultiplicity: 1isOrdered: N/AisUnique: TruedefaultValue: NoneisNullable: False |
| virtualDisk | It indicates the minimum virtual disk storage requirement for the EAS (see clause 7.1.9.4.3.2 in ETSI NFV IFA-011 [7]). | type: Integermultiplicity: 1isOrdered: N/AisUnique: TruedefaultValue: NoneisNullable: False |
| eESAddress | One or more URLs and/or IP Address(es) of EES(s) (See TS 23.558 [2]). allowedValues: N/A | type: Stringmultiplicity: 1..\*isOrdered: N/AisUnique: N/AdefaultValue: NoneallowedValues: N/AisNullable: False |
| eESIdentifier | It identifies the EES, see 3GPP TS 23.558. | type: Stringmultiplicity: 1isOrdered: N/AisUnique: TruedefaultValue: NoneisNullable: False |
| eASFunctionRef | This is the DN of EASFunction. allowedValues: DN of the EASFunction MOI. | type: DNmultiplicity: 1..\*isOrdered: N/AisUnique: TruedefaultValue: NoneisNullable: False |
| serviceContinuitySupport | This parameter defines whether the EES supports service continuity, see 3GPP TS 23.558 | type: Boolenmultiplicity: 1..\*isOrdered: N/AisUnique: TruedefaultValue: NoneisNullable: False |
| eESservingLocation | It defines the serving location for an EES. | type: ServingLocationmultiplicity: 1..\*isOrdered: N/AisUnique: TruedefaultValue: NoneisNullable: False |
| eESAddress | One or more URLs and/or IP Address(es) of EES(s) (See TS 23.558 [2]). allowedValues: N/A | type: Stringmultiplicity: 1..\*isOrdered: N/AisUnique: N/AdefaultValue: NoneallowedValues: N/AisNullable: False |
| aCID | Identifies the AC(s) that can be served by the EAS (See TS 23.558 [2]). | type: Stringmultiplicity: 1…\*isOrdered: N/AisUnique: TruedefaultValue: NoneallowedValues: N/AisNullable: False |
| eASProvider | The identifier of the ASP that provides the EAS (See TS 23.558 [2]). | type: Stringmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneallowedValues: N/AisNullable: False |
|  |  |  |
| eASdescription | Human-readable description of the EAS (See TS 23.558 [2]). | type: Stringmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneallowedValues: N/AisNullable: False |
| eASSchedule | The availability schedule of the EAS (e.g. time windows) (See TS 23.558 [2]). | type: Durationmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneallowedValues: N/AisNullable: False |
| startTime | It defines the start time of the duration for which the EAS is available. | type: DateTimemultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneallowedValues: N/AisNullable: False |
| endTime | It defines the send time of the duration for which the EAS is available. | type: DateTimemultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneallowedValues: N/AisNullable: False |
| eASGeographicalServiceArea | The geographical service area that the EAS serves. ACs in UEs that are located outside that area shall not be served (See TS 23.558 [2]). | type: GeoLocmultiplicity: 1isOrdered: N/AisUnique: TruedefaultValue: NoneallowedValues: N/AisNullable: False |
| eASTopologicalServiceArea | The EAS serves UEs that are connected to the Core Network from one of the cells included in this service area. ACs in UEs that are located outside this area shall not be served. (See TS 23.558 [2]). | type: TopologicalServiceAreamultiplicity: 1isOrdered: N/AisUnique: TruedefaultValue: NoneallowedValues: N/AisNullable: False |
|  |  |  |
| eASServicePermissionLevel | Level of service permissions e.g. trial, gold-class supported by the EAS (See TS 23.558 [2]).Allowed Values: TRIAL, SILVER, GOLD | type: ENUMmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneallowedValues: N/AisNullable: False |
| eASFeature | Service features e.g. single vs. multi-player gaming service supported by the EAS (See TS 23.558 [2]).Allowed Value: SINGLE, MULTIPLE | type: ENUMmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneallowedValues: N/AisNullable: False |
| eASServiceContinuitySupport | Indicates if the EAS supports service continuity or not. This IE also indicates which ACR scenarios are supported by the EAS (See TS 23.558 [2]).Default value: FALSE | type: Booleanmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneallowedValues: N/AisNullable: False |
| eASDNAI | DNAI(s) associated with the EAS. This IE is used as Potential Locations of Applications. It is a subset of the DNAI(s) associated with the EDN where the EAS resides. | type: Stringmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneallowedValues: N/AisNullable: False |
| eASAvailabilityReportingPeriod | The availability reporting period (i.e. heartbeat period) that indicates to the EES how often it needs to check the EAS's availability after a successful registration (See TS 23.558 [2]). | type: Integermultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneallowedValues: N/AisNullable: False |
| eASStatus | The status of the EAS (e.g. enabled, disabled, etc.) (See TS 23.558 [2]). Allowed values: ENABLED, DISABLED | type: ENUMmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneallowedValues: N/AisNullable: False |

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| **Next modification** |

openapi: 3.0.1

info:

 title: 3GPP Edge NRM

 version: 17.1.0

 description: >-

 OAS 3.0.1 specification of the Edge NRM

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externalDocs:

 description: 3GPP TS 28.538; Edge NRM

 url: http://www.3gpp.org/ftp/Specs/archive/28\_series/28.538/

paths: {}

components:

 schemas:

#-------- Definition of types-----------------------------------------------------

 ServingLocation:

 type: object

 properties:

 geographicalLocation:

 $ref: '#/components/schemas/GeoLoc'

 topologicalLocation:

 $ref: '#/components/schemas/TopologicalServiceArea'

 TopologicalServiceArea:

 type: object

 properties:

 cellIdList:

 type: array

 items:

 type: integer

 trackingAreaIdList:

 $ref: 'TS28541\_NrNrm.yaml#/components/schemas/TaiList'

 servingPLMN:

 $ref: 'TS28541\_NrNrm.yaml#/components/schemas/PLMNId'

 GeoLoc:

 type: object

 properties:

 geographicalCoordinates:

 $ref: '#/components/schemas/GeographicalCoordinates'

 civicLocation:

 type: string

 GeographicalCoordinates:

 type: object

 properties:

 latitude:

 type: integer

 longitude:

 type: integer

 EDNConnectionInfo:

 type: object

 properties:

 dNN:

 type: string

 eDNServiceArea:

 $ref: '#/components/schemas/ServingLocation'

 AffinityAntiAffinity:

 type: object

 properties:

 affinityEAS:

 type: array

 items:

 type: string

 antiAffinityEAS:

 type: string

 VirtualResource:

 type: object

 properties:

 virtualMemory:

 type: integer

 virtualDisk:

 type: integer

 virtualCPU:

 type: string

 Duration:

 type: object

 properties:

 startTime:

 $ref: 'TS28623\_ComDefs.yaml#/components/schemas/DateTime'

 endTime:

 $ref: 'TS28623\_ComDefs.yaml#/components/schemas/DateTime'

 SoftwareImageInfo:

 type: object

 properties:

 minimumDisk:

 type: integer

 minimumRAM:

 type: integer

 discFormat:

 type: string

 operatingSystem:

 type: string

 swImageRef:

 type: string

 description: indicates the reference to the actual software image that is represented by URL (see clause 7.1.6.5 in ETSI NFV IFA-011 [7]).

 EASServicePermission:

 type: string

 description: any of enumrated value

 enum:

 - TRIAL

 - SILVER

 - GOLD

 EASFeature:

 type: string

 description: any of enumrated value

 enum:

 - SINGLE

 - MULTIPLE

 EASStatus:

 type: string

 description: any of enumrated value

 enum:

 - ENABLED

 - DISABLED

#-------- Definition of concrete IOCs --------------------------------------------

 MnS:

 oneOf:

 - type: object

 properties:

 SubNetwork:

 $ref: '#/components/schemas/SubNetwork-Multiple'

 SubNetwork-Single:

 allOf:

 - $ref: 'TS28623\_GenericNrm.yaml#/components/schemas/Top'

 - type: object

 properties:

 attributes:

 allOf:

 - $ref: 'TS28623\_GenericNrm.yaml#/components/schemas/SubNetwork-Attr'

 - type: object

 properties:

 Subnetwork:

 $ref: '#/components/schemas/SubNetwork-Multiple'

 ECSFunction:

 $ref: '#/components/schemas/ECSFunction-Multiple'

 EdgeDataNetwork:

 $ref: '#/components/schemas/EdgeDataNetwork-Multiple'

 - $ref: 'TS28623\_GenericNrm.yaml#/components/schemas/SubNetwork-ncO'

 EdgeDataNetwork-Single:

 allOf:

 - $ref: 'TS28623\_GenericNrm.yaml#/components/schemas/Top'

 - type: object

 properties:

 ednIdentifier:

 type: string

 eDNConnectionInfo:

 $ref: '#/components/schemas/EDNConnectionInfo'

 - type: object

 properties:

 EASFunction:

 $ref: '#/components/schemas/EASFunction-Multiple'

 EESFunction:

 $ref: '#/components/schemas/EESFunction-Multiple'

 EASFunction-Single:

 allOf:

 - $ref: 'TS28623\_GenericNrm.yaml#/components/schemas/Top'

 - type: object

 properties:

 attributes:

 allOf:

 - $ref: 'TS28623\_GenericNrm.yaml#/components/schemas/ManagedFunction-Attr'

 - type: object

 properties:

 eASIdentifier:

 type: string

 eESAddress:

 type: array

 items:

 type: string

 eASRequirementsRef:

 $ref: 'TS28623\_ComDefs.yaml#/components/schemas/Dn'

 eASAddress:

 type: array

 items:

 type: string

 - $ref: 'TS28623\_GenericNrm.yaml#/components/schemas/ManagedFunction-ncO'

 EASProfile:

 allOf:

 - $ref: 'TS28623\_GenericNrm.yaml#/components/schemas/Top'

 - type: object

 properties:

 aCID:

 type: string

 eASProvider:

 type: string

 eASdescription:

 type: string

 eASSchedule:

 $ref: '#/components/schemas/Duration'

 eASGeographicalServiceArea:

 $ref: '#/components/schemas/GeoLoc'

 eASTopologicalServiceArea:

 $ref: '#/components/schemas/TopologicalServiceArea'

 eASServicePermissionLevel:

 $ref: '#/components/schemas/EASServicePermission'

 eASFeature:

 $ref: '#/components/schemas/EASFeature'

 eASServiceContinuitySupport:

 type: boolean

 eASDNAI:

 type: string

 eASAvailabilityReportingPeriod:

 type: integer

 eASStatus:

 $ref: '#/components/schemas/EASStatus'

 EESFunction-Single:

 allOf:

 - $ref: 'TS28623\_GenericNrm.yaml#/components/schemas/Top'

 - type: object

 properties:

 attributes:

 allOf:

 - $ref: 'TS28623\_GenericNrm.yaml#/components/schemas/ManagedFunction-Attr'

 - type: object

 properties:

 eESIdentifier:

 type: string

 eESServingLocation:

 type: array

 items:

 $ref: '#/components/schemas/ServingLocation'

 eESAddress:

 type: array

 items:

 type: string

 softwareImageInfo:

 $ref: '#/components/schemas/SoftwareImageInfo'

 serviceContinuitySupport:

 type: boolean

 eASFunctonRef:

 $ref: 'TS28623\_ComDefs.yaml#/components/schemas/DnList'

 - $ref: 'TS28623\_GenericNrm.yaml#/components/schemas/ManagedFunction-ncO'

 ECSFunction-Single:

 allOf:

 - $ref: 'TS28623\_GenericNrm.yaml#/components/schemas/Top'

 - type: object

 properties:

 attributes:

 allOf:

 - $ref: 'TS28623\_GenericNrm.yaml#/components/schemas/ManagedFunction-Attr'

 - type: object

 properties:

 eCSAddress:

 type: string

 providerIdentifier:

 type: string

 edgeDataNetworkRef:

 $ref: 'TS28623\_ComDefs.yaml#/components/schemas/DnList'

 eESFuncitonRef:

 $ref: 'TS28623\_ComDefs.yaml#/components/schemas/DnList'

 softwareImageInfo:

 $ref: '#/components/schemas/SoftwareImageInfo'

 - $ref: 'TS28623\_GenericNrm.yaml#/components/schemas/ManagedFunction-ncO'

 EASRequirements:

 allOf:

 - $ref: 'TS28623\_GenericNrm.yaml#/components/schemas/Top'

 - type: object

 properties:

 requiredEASservingLocation:

 $ref: '#/components/schemas/ServingLocation'

 affinityAntiAffinity:

 $ref: '#/components/schemas/AffinityAntiAffinity'

 serviceContinuity:

 type: boolean

 virtualResource:

 $ref: '#/components/schemas/VirtualResource'

 softwareImageInfo:

 $ref: '#/components/schemas/SoftwareImageInfo'

#-------- Definition of JSON arrays for name-contained IOCs ----------------------

 SubNetwork-Multiple:

 type: array

 items:

 $ref: '#/components/schemas/SubNetwork-Single'

 EASFunction-Multiple:

 type: array

 items:

 $ref: '#/components/schemas/EASFunction-Single'

 ECSFunction-Multiple:

 type: array

 items:

 $ref: '#/components/schemas/ECSFunction-Single'

 EESFunction-Multiple:

 type: array

 items:

 $ref: '#/components/schemas/EESFunction-Single'

 EdgeDataNetwork-Multiple:

 type: array

 items:

 $ref: '#/components/schemas/EdgeDataNetwork-Single'

#--------------------------------- Definition ------------------------------------

 resources-edgeNrm:

 oneOf:

 - $ref: '#/components/schemas/MnS'

 - $ref: '#/components/schemas/SubNetwork-Single'

 - $ref: '#/components/schemas/EASFunction-Single'

 - $ref: '#/components/schemas/ECSFunction-Single'

 - $ref: '#/components/schemas/EESFunction-Single'

 - $ref: '#/components/schemas/EdgeDataNetwork-Single'

 - $ref: '#/components/schemas/EASRequirements'

 - $ref: '#/components/schemas/EASProfile'

|  |
| --- |
| **Next modification** |

Annex B (normative):
Availability Zone

## A.1 General

An Availability Zone [x] is the lowest level of abstraction exposed to a developer who wants to deploy an application on the edge network. It is defined in terms of a geographical area. A Cloudlet[x] is a point of presence for the edge cloud. It is the point where edge applications are deployed. The ECSP do not expose physical location of the cloudlets to the application service providers. The application service provider is not allowed to request deployment of its application on a specific edge cloud. There can be multiple Cloudlet in an Availability Zone. The application service provider can query for the QoS (latency, jitter etc.) available in a particular Availability Zone. The OP requires application service provider to specify target Availability Zone, when requesting for an Application deployment. The virtual resources can be reserved in a particular Availability Zone on request from the application service provider.

As ASP queries the available Availability Zones. The ECSP respond with all the available zone and their characteristics including the QoS supported in each of them. The ASP choose one of the Availability Zone to deploy an application on. ASP request ECSP to deploy an application in the selected Availability Zone. ECSP deploy the given application as part of the AZ.

A.2 Example of Availability Zone implementation

The following figure shows the relation between AZ and EDN.



Figure 5.1.x.1 Example of Availability Zone

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| --- |
| **Next modification** |

Annex X (Informative):
GSMA OP introduction and concept mapping

The Operator Platform (OP) is defined by GSMA OPG [2], it facilitates access to the Edge Cloud capability of an Operator or federation of operators and their partners.

The architecture scope under definition is shown below,



Figure 4.2-1: OP Roles and Interfaces Reference Architecture

The NBI is the interface between the application provider and the Capabilities Exposure Role in the Operator Platform, it allows an OP to advertise the above cloud capabilities that it can provide to application providers. In addition, the NBI allows an application provider to reserve a set of resources or request an Edge Cloud service with the resources and features that they require and for the OP to accept or reject the request.

The following table provides the mapping of concepts (not exhaustive) defined in TS 28.538[6] with the concepts defined in GSMA OPG [x].

|  |  |  |
| --- | --- | --- |
| GSMA[x] | ECM(TS 28.538) | Comment/Observations |
| Application InstanceEdge Application | EAS VNF InstanceEAS | Application Instance and EAS VNF Instance are both referring to the application instances running in the edge.Edge Application and EAS are both referring to the application running in the edge. |
| Application Provider | Application Service Provider | Application Provider and Application Service Provider both referring to the application providers producing and requesting for the deployment of the applications. |
| Region | FFS | The higher construct in the hierarchy exposed to a developer who wishes to deploy an Application on the Edge Cloud and broadly represents a geography. A Region typically contains one or multiple Availability Zones.An OP Region is equivalent to a Region on a public cloud |
| Availability Zone | FFS | An Availability Zone is the lowest level of abstraction exposed to a developer who wants to deploy an Application on the edge network. The capability to create Cloudlets within an Availability Zone is to be provide by the OP.An OP Availability Zone is the equivalent of an Availability Zone on Public Cloud |
| Cloudlet | FFS | A cloudlet is a point of presence for the Edge Cloud. It is the point where Edge Applications are deployed. While EAS deployment, appropriate EDN is selected to deploy the EAS on. |
|  |  |  |
| Capabilities Exposure Role in OP | ECSP Management System | Both Capabilities Exposure Role in Operator Platform and the ECSP Management System are the entities which exposes interface and management service towards ASP. |
| Northbound Interface | Management services for Edge Computing lifecycle management | NBI maps to management service, enabling LCM for EAS, exposed towards ASP. |
|  |  |  |

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| **End Of Modified Section** |