**3GPP TSG-SA5 Meeting #157 *S5-246191***

Hyderabad, India, 14 - 18 October 2024

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *CR-Form-v12.3* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **28.538** | **CR** | **0092** | **rev** | **1** | **Current version:** | **19.1.0** |  |
|  | | | | | | | | |
| *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)*.* | | | | | | | | |
|  | | | | | | | | |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ***Proposed change affects:*** | UICC apps |  | ME |  | Radio Access Network |  | Core Network | **X** |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | | | | | | | | | | |
| ***Title:*** | Rel-19 CR TS 28.538 Correct the description of attributes | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Huawei | | | | | | | | | |
| ***Source to TSG:*** | SA5 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | TEI17 | | | | |  | ***Date:*** | | | 2024-09-27 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **A** |  | | | | | ***Release:*** | | | Rel-19 |
|  | *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 can be 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-17 (Release 17) Rel-18 (Release 18) Rel-19 (Release 19)  Rel-20 (Release 20)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | 1. The source position of the reference should be detailed. 2. The definition of some attributes should align with the description in TS 23.558. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | 1. Correct the typo “ESCP” into “ECSP”. 2. Update reference of some attributes. 3. Add an allowed value for eASStatus to align with the description in TS 23.558. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | The definition of attributes will be inconsistent with those in TS 23.558. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 5.1.15, 6.4.1 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **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:*** | | Forge MR link: <https://forge.3gpp.org/rep/sa5/MnS/-/merge_requests/1362> at commit f2290b75fc279cbc048f36cb0900cb8d1fd11af3 | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

|  |
| --- |
| **1st Change** |

### 5.1.15 EAS Relocation

The ECSP Management System may decide that a different EDN can better host the EAS. The EAS relocation trigger from ECSP Management System are related with lifecycle management of its edge compute resources. The ASP provides its policy indication regarding change of the edge compute resource hosting the Edge Application. There ECSP Management System considers this policy while relocating EAS within the ED or from one EDN to another.

The ASP indicates the following policies:

- Its Edge Application cannot be moved from one edge compute resource to another;

- Its Edge Application can be moved from one edge compute resource to another, without any notification;

- Its Edge Application can be moved from one edge compute resource to another with prior notification.

When the policy is that a change of edge compute resource can be done with prior notification, the ECSP Management System decides that a change of edge compute resource is needed and selects the new edge compute resource. In this case, the ASP chooses the exact timing of the move. If the ASP indicates that the EAS is not able to handle relocation, the ECSP Management System shall not initiate relocation procedure.

|  |
| --- |
| **2nd Change** |

6.4.1 Attribute Properties

| **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: String  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| eASAddress | One or more URLs and/or IP Address(es) of EAS(s) (See EAS Endpoint defined in clause 8.2.4 in TS 23.558 [2]).  allowedValues: N/A | type: String  multiplicity: 1..\*  isOrdered: False  isUnique: True  defaultValue: None  isNullable: False |
| eASREquirementsRef | This is the DN of EASRequirements.  allowedValues: Not applicable | type: DN  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| eESFunctionRef | This is the DN of EESFunction.  allowedValues: DN of the EESFunction MOI. | type: DN  multiplicity: 1..\*  isOrdered: False  isUnique: True  defaultValue: None  isNullable: False |
| registrationInfo | This refers to the registration information (see clause see clause 8.4.3 and 8.4.4 in TS 23.558 [2]).  allowedValues: N/A | type: RegistrationInfo  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| registrationExpiry | This specifies the expiration time of the EAS and EES Registration (see clause 8.4.3 and 8.4.4 in TS 23.558 [2]). | type: DateTime  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| registrationID | This identifies particular EAS and EES registration. (see clause 8.4.3 and 8.4.4 in TS 23.558 [2]). | type: String  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| secCredential | This specifies the security credentials of the EAS and EES Registration (see clause 8.4.3 and 8.4.4 in TS 23.558 [2]). | type: String  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| edgeDataNetworkRef | This holds a list of DN of EdgeDataNetwork. | type: DN  multiplicity: 1..\*  isOrdered: False  isUnique: True  defaultValue: None  isNullable: 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: ServingLocation  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: 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: GeoLoc  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| latitude | This defines the single latitude coordinate. | type: Float  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| longitude | This defines the single longitude coordinate. | type: Float  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: 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: String  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: 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: TopologicalServiceArea  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: 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: GeographicalCoordinates  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: 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: SoftwareImageInfo  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: 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: String  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: 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: Integer  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: 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: Integer  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| diskFormat | It indicates the disk format requirement for the EAS software (see clause 7.1.6.5 in ETSI NFV IFA-011 [7]). | type: String  multiplicity: 1  isOrdered: N/A  isUnique: True  defaultValue: None  isNullable: False |
| operatingSystem | It indicates the operating system requirement for the EAS software (see clause 7.1.6.5 in ETSI NFV IFA-011 [7]). | type: String  multiplicity: 1  isOrdered: N/A  isUnique: True  defaultValue: None  isNullable: 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: Integer  multiplicity: \*  isOrdered: False  isUnique: Yes  defaultValue: None  isNullable: False |
| trackingAreaIdList | It represents the list of tracking areas within a PLMN. | type: TAI  multiplicity: 1..\*  isOrdered: False  isUnique: True  defaultValue: None  isNullable: False |
| servingPLMN | It specifies the PLMN to be served. | type: PLMNId  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: True |
| ecsAddress | One or more URLs and/or IP Address(es) of ECS(s) (See ECS address defined in clause 8.2.12 in TS 23.558 [2]).  allowedValues: N/A | type: String  multiplicity: 1..\*  isOrdered: False  isUnique: True  defaultValue: None  isNullable: False |
| providerIdentifier | The identifier of the ECSP that provides the ECS (See TS 23.558 [2]).  allowedValues: N/A | type: string  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| eDNConnectionInfo | It defines the set of information needed to connect to an EDN. | type: EDNConnectionInfo  multiplicity: 1..\*  isOrdered: False  isUnique: True  defaultValue: None  isNullable: False |
| eDNServiceArea | This parameter defines the service location for the EDN (see clause 7.3.3.4 in TS 23.558 [2]). | type: ServingLocation  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| ednIdentifier | The identifier of the edge data network (See TS 23.558 [2]).  allowedValues: N/A | type: string  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| affinityAntiAffinity | This parameter defines the affinity and anti-requirements of the EAS with other EAS on the same EDN. | type: AffinityAntiAffinity  multiplicity: 1  isOrdered: N/A  isUnique:  defaultValue: None  isNullable: False |
| affinityEAS | This parameter defines the EAS identifier with which the affinity is required. | type: String  multiplicity: 1..\*  isOrdered: False  isUnique: True  defaultValue: None  isNullable: False |
| antiAffinityEAS | This parameter defines the EAS identifier with which the anti-affinity is required. | type: String  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: 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: Boolean  multiplicity: 1..\*  isOrdered: False  isUnique: True  defaultValue: False  isNullable: False |
| virtualResource | This parameter defines the virtual resource requirements of an EAS. | type: VirtualResource  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: 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: Integer  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: 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: Integer  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| virtualCPU | It indicates the virtual CPU requirement for the EAS (see clause 7.1.9.2.3.2 in ETSI NFV IFA-011 [7]). | type: String  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| eESAddress | One or more URLs and/or IP Address(es) of EES(s) (See EES Endpoint defined in clause 8.2.6 in TS 23.558 [2]).  allowedValues: N/A | type: String  multiplicity: 1..\*  isOrdered: False  isUnique: True  defaultValue: None  isNullable: False |
| eESIdentifier | It identifies the EES, see EESID defined in clause 8.2.6 in 3GPP TS 23.558[2]. | type: String  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| eASFunctionRef | This is the DN of EASFunction.  allowedValues: DN of the EASFunction MOI. | type: DN  multiplicity: 1..\*  isOrdered: False  isUnique: True  defaultValue: None  isNullable: False |
| serviceContinuitySupport | This parameter defines whether the EES supports service continuity, see 3GPP TS 23.558 | type: Boolen  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| eESservingLocation | It defines the serving location for an EES. | type: ServingLocation  multiplicity: 1..\*  isOrdered: False  isUnique: True  defaultValue: None  isNullable: False |
| eESFunctionRef | This is the DN of EESFunction.  allowedValues: DN of the EESFunction MOI. | type: DN  multiplicity: 1..\*  isOrdered: False  isUnique: True  defaultValue: None  isNullable: False |
| aCID | Identifies the AC(s) that can be served by the EAS (See TS 23.558 [2]).  allowedValues: N/A | type: String  multiplicity: 1..\*  isOrdered: False  isUnique: True  defaultValue: None  isNullable: False |
| eASProvider | The identifier of the ASP that provides the EAS (See EAS Provider ID defined in clause 8.6.5.3.2 in TS 23.558 [2]).  allowedValues: N/A | type: String  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| eASdescription | Human-readable description of the EAS (See EAS description defined in clasue 8.2.4 in TS 23.558 [2]).  allowedValues: N/A | type: String  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| eASSchedule | The availability schedule of the EAS (e.g. time windows) (See EAS Schedule defined in clause 8.2.4 in TS 23.558 [2]).  allowedValues: N/A | type: Duration  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| startTime | It defines the start time of the duration for which the EAS is available.  allowedValues: N/A | type: DateTime  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| endTime | It defines the send time of the duration for which the EAS is available.  allowedValues: N/A | type: DateTime  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| eASGeographicalServiceArea | The geographical service area that the EAS serves. ACs in UEs that are located outside that area shall not be served (See EAS Geographical Service Area defined in clause 8.2.4 in TS 23.558 [2]).  allowedValues: N/A | type: GeoLoc  multiplicity: 1..\*  isOrdered: False  isUnique: True  defaultValue: None  isNullable: 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 EAS Topological Service Area defined in clause 8.2.4 in TS 23.558 [2]).  allowedValues: N/A | type: TopologicalServiceArea  multiplicity: 1..\*  isOrdered: False  isUnique: True  defaultValue: None  isNullable: False |
| eASServicePermissionLevel | Level of service permissions e.g. trial, gold-class supported by the EAS (See EAS service permission level defined in clasue 8.2.4 in TS 23.558 [2]).  Allowed Values: TRIAL, SILVER, GOLD | type: ENUM  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| eASFeature | Service features e.g. single vs. multi-player gaming service supported by the EAS (See EAS Feature(s) defined in clause 8.2.4 in TS 23.558 [2]).  Allowed Value: N/A | type: String  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| eASServiceContinuitySupport | Indicates if the EAS supports service continuity or not. This IE also indicates which ACR scenarios are supported by the EAS (See EAS Service continuity support defined in clause 8.2.4 in TS 23.558 [2]). | type: Boolean  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: False  isNullable: 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.  allowedValues: N/A | type: String  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: 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 EAS Availability Reporting Period defined in clause 8.2.4 in TS 23.558 [2]).  allowedValues: N/A | type: Integer  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| eASStatus | The status of the EAS (e.g. enabled, disabled, overload warning, etc.) (See EAS Status defined in clause 8.2.4 in TS 23.558 [2]).  Allowed values: ENABLED, DISABLED, OVERLOAD\_WARNING | type: ENUM  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| reservationLocation | This parameter defines the location where the resource needs to be reserved | type: ServingLocation  multiplicity: 1  isOrdered: N/A  isUnique: True  defaultValue: None  isNullable: False |
| resourceReservationRequirement | This parameter defines the resource requirements that needs to be reserved. | type: ResourceReservationRequirement  multiplicity: 1..\*  isOrdered: False  isUnique: True  defaultValue: None  isNullable: False |
| computeRequirement | This parameter defines the compute requirement for reservation (see VirtualComputeDesc in clause 7.1.9.2.2 in ETSI NFV IFA-011 [7]). | type: String  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| storageRequirement | This parameter defines the storaget requirement for reservation (see VirtualStorageDesc in clause 7.1.9.4.2 in ETSI NFV IFA-011 [7]). | type: String  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| networtkingRequirement | This parameter defines the networking requirement for reservation. It is described as the connection bandwidth in Kbit/s reserved for EAS to use. | type: Integer  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| requestedReservationExpiration | This parameter defines the MnS consumer's requirememts for the validity period of the resource reservation.  allowedValues: N/A | type: DateTime  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| resourceReservationStatus | This parameter defines the status for the reserved resources. | type: ResourceReservationStatus  multiplicity: 1..\*  isOrdered: False  isUnique: True  defaultValue: None  isNullable: False |
| resourceId | It identifies a reserved resource. | type: String  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| reservationStatus | This parameter defines the status for a reserved resource. This attribute is configured by MnS producer and can be read by MnS consumer.  Allowed Value:  RESERVED: which means the specified resources is reserved and available to be used by the ASP.  USED: which means the reserved resource is used by ASP. | type: Enum  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| relocationTriggerInfo | This attribute dictates the relocation trigger for the EAS. It is a complex type which include the following attributes.  allowedValues: N/A | type: RelocationTriggerInfo  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: LOCKED  isNullable: False |
| relocationType | This attribute defines if the EAS is to be relocated immediately or at a future point of time.  AllowedValue: “IMMEDIATE”, “FUTURE”, “NO-RELOCATION” | type: ENUM  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: Not isNullable: False |
| futuristicTriggerTime | This attribute defines a time stamp in future at which the EAS relocation will be initiated.  allowedValues: N/A | type: DateTime  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| relocationRejectByASP | A Boolean attribute which can be updated by the ASP to indicate its disagreement with the relocation. The value TRUE indicate that the ASP do not agree with the relocation.  Allowed Values: NA | type: Boolean  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: FALSE  isNullable: False |
| relocationPolicy | This attribute described the EAS relocation policies from the ASP.  YES: This dictates that an EAS can be relocated as and when required  NO: This dictates an EAS cannot be relocated at all  YESwNOTIFY: This indicates that an EAS can be relocated with a prior notification  allowedValues: "YES", "NO", “YESwNOTIFY”  Editors Note: The notification mechanism in FFS. | type: ENUM  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| availableEdgeVirtualResources | This parameter defines the available edge virtual resources managed by an EDN (see NfviCapacityInfo in clause 10.5.2.3 of ETSI NFV SOL-005 [17]). | type: String  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| vnfdId | It indicates the identifier of the VNFD which contains the virtual resource requirements of an EAS. (see clause 7.1.2.2 in ETSI NFV IFA-011 [7]). | type: String  multiplicity: 1  isOrdered: N/A  isUnique: True  defaultValue: None  isNullable: False |
| participatingOPiD | This identifies the PO.  allowedValues: N/A | type: String  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| leadingOPiD | This identifies the LO.  allowedValues: N/A | type: String  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| federationID | This identifies the particular federation created.  allowedValues: N/A | type: String  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| FederationExpiry | This defines the time post which the federation relationship shall expire.  allowedValues: N/A | type: DateTime  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| initiationTime | Date and time of the federation initiated by the Leading operator.  allowedValues: N/A | type: DateTime  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| acceptedEDNList | It provides the list of EDN that are accepted by the LO.  allowedValues: N/A | type: DN  multiplicity: 1…\*  isOrdered: False  isUnique: True  defaultValue: None  isNullable: False |
| resourceQuota | This defines the virtual resource quota assigned to the LO by the PO as per the federation relationship. This may be the subset of available virtual resource (indicate with attribute availableVirtualResource) in the EDN. The LO will only be authorized to reserve and use this amount of resources.  allowedValues: N/A | type: VirtualResource  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| availableEASResource | This defines the available EAS in the shared EDN. This will be the DN of EASProfile.  allowedValues: N/A | type: DN  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| avaibleEDNList | This defines information related with offered EDN available with PO.  allowedValues: N/A | type: AvailableEDNList  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| federationID | This defines the federation ID provided by the PO to LO at the time of federation establishment.  allowedValues: N/A | type: String  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| reservationID | This identifies the reserved block of resources. This will be the DN of EASResourceReservationJob.  allowedValues: N/A | type: DN  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| federateECSIdentifier | This defines the ECS that is to be shared as part of edge federation. This will be a DN of the ECS deployed in the participating operator domain for edge services. | type: DN  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| federatedPOPIdentifier | The identifier of the participating operator | type: String  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| federatedECSProfile | The information related with ECS Profile. See clause 8.2.12 of [2]. | type: String  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| servedEASList | This defines the list of EAS(s) available with the partner ECS. This specifies the DN of EASFunction instance. | type: DN  multiplicity: \*  isOrdered: False  isUnique: True  defaultValue: None  isNullable: False |
| servedEESList | This defines the list of EES(s) available with the partner ECS. This specifies the DN of EESFunction instance. | type: DN  multiplicity: \*  isOrdered: False  isUnique: True  defaultValue: None  isNullable: False |
| sharedECSInfo | This defines the ECS(s) belonging to P-OP that can be used in case of roaming and federation | type: FederatedECSInfo  multiplicity: \*  isOrdered: False  isUnique: True  defaultValue: None  isNullable: False |
| federatedECSInfo | This defines the information related with shared ECS | type: FederatedECSInfo  multiplicity: \*  isOrdered: False  isUnique: True  defaultValue: None  isNullable: False |
| availableEDN | This defines the available EDN. | type: DN  multiplicity: 1  isOrdered: False  isUnique: True  defaultValue: None  isNullable: False |
| eASDeploymentMonitor | Provides monitoring for the process of deployment of EAS(s). The data type of this attribute is the "ProcessMonitor" as defined in TS 28.622[4].  allowedValues: N/A | type: ProcessMonitor  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| bundleIdentifier | Identifier of the bundle. See clause 8.2.2 [2] | type: String  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| bundledEASIdentifier | List of EAS identifier associated with the EAS bundle. See clause 8.2.2 [2]. | type: String  multiplicity: \*  isOrdered: False  isUnique: True  defaultValue: None  isNullable: False |
| bundleType | Type of the EAS bundle. See clause 8.2.2 [2].  Allowed Values: DIRECT, PROXY | type: ENUM  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| mainEASIdentifier | Indicate which EAS in a bundle takes the main EAS service role. See clause 8.2.2 [2]. | type: String  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| coordinatedEASDiscovery | Indicates if coordinated EAS discovery is required i.e., if EAS discovery request for one of the bundled EAS is processed, then EAS discovery response should include information of all the EASs belonging to the bundle. See clause 8.2.10 [2]. | type: Boolean  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: False  isNullable: False |
| coordinatedACR | Indicates if coordinated ACR is required i.e., if EAS ACR is initiated for one of the bundled EAS, then ACR should be initiated for all the EASs belonging to the bundle.  The IE may further indicate what actions must be taken if ACR for one or more bundled EAS fails e.g. ACR for all other EAS that are part of the bundle must be cancelled or not. See clause 8.2.10 [2]. | type: Boolean  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| eDNAffinity | Indicates the affinity requirement of the EAS bundle. The IE can be set to "strong" indicating that the EASs must be in the same EDN, "preferred" indicating that it is nice to have EASs in the same EDN but not essential or "weak" indicating that it’s not essential for EASs to be in the same EDN. See clause 8.2.10 [2].  Allowed Values: “STRONG”, “WEAK”, “PREFERRED” | type: ENUM  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| EASBundle.eASFunctionRef | This indicates the constituent EAS of the EAS bundle. | type: DN  multiplicity: \*  isOrdered: False  isUnique: True  defaultValue: None  isNullable: False |
| EASBundle.EESFunctionRef | This indicate the related EES with the EAS bundle | type: DN  multiplicity: \*  isOrdered: False  isUnique: True  defaultValue: None  isNullable: False |
| EASBundle. eASRequirementsRef | This indicates the requirements for each constituent EAS in the bundle. | type: DN  multiplicity: \*  isOrdered: False  isUnique: True  defaultValue: None  isNullable: False |
| EASFunction. eASBundleRef | This indicates the EAS bundles in which the EAS is included. See clause 8.2.2 [2]. | type: DN  multiplicity: \*  isOrdered: False  isUnique: True  defaultValue: None  isNullable: False |
| EESFunction. eASBundleRef | This indicates the related EAS bundles with the EES. See clause 8.2.2 [2]. | type: DN  multiplicity: \*  isOrdered: False  isUnique: True  defaultValue: None  isNullable: False |
| eASBundleInfo | This defines the bundle relation information for the EAS | type: EASBundleInfo  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: True  isNullable: False |
| isBundlingAllowed | This defines whether the EAS should be put in a bundle. The FALSE value indicates that this EAS shall not be part of any bundle. | type: Boolean  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: True  isNullable: False |
| allowedBundelref | This defines the EAS bundles where this EAS can be placed. | type: DN  multiplicity: \*  isOrdered: False  isUnique: True  defaultValue: None  isNullable: False |

|  |
| --- |
| **Next Change** |

\*\*\* START OF CHANGE 1 \*\*\*

\*\*\* OpenAPI/TS28538\_EdgeNrm.yaml \*\*\*

<CODE BEGINS>

openapi: 3.0.1

info:

title: 3GPP Edge NRM

version: 19.0.0

description: >-

OAS 3.0.1 specification of the Edge NRM

© 2024, 3GPP Organizational Partners (ARIB, ATIS, CCSA, ETSI, TSDSI, TTA, TTC).

All rights reserved.

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: 'TS28623\_ComDefs.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: array

items:

type: string

VirtualResource:

type: object

properties:

virtualMemory:

type: integer

virtualDisk:

type: integer

virtualCPU:

type: string

vnfdId:

type: string

SoftwareImageInfo:

type: object

properties:

minimumDisk:

type: integer

minimumRAM:

type: integer

discFormat:

type: string

operatingSystem:

type: string

swImageRef:

type: string

RegistrationInfo:

type: object

properties:

registrationExpiry:

type: string

readOnly: true

registrationID:

type: string

readOnly: true

secCredential:

type: string

Duration:

type: object

properties:

startTime:

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

endTime:

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

EASServicePermission:

type: string

description: any of enumerated value

enum:

- TRIAL

- SILVER

- GOLD

EASFeature:

type: string

EASStatus:

type: string

description: any of enumerated value

enum:

- ENABLED

- DISABLED

- OVERLOAD\_WARNING

ResourceReservationRequirement:

type: object

properties:

computeRequirement:

type: string

storageRequirement:

type: string

networkingRequirement:

type: integer

ResourceReservationStatus:

type: object

properties:

resourceId:

type: string

reservationStatus:

type: string

description: any of enumrated value

enum:

- RESERVED

- USEd

RelocationTriggerInfo:

type: object

properties:

triggerType:

type: string

description: any of enumrated value

enum:

- IMMEDIATE

- FUTURE

futuristicTriggerTime:

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

AvailableEDNList:

type: object

properties:

resourceQuota:

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

FederatedECSInfo:

type: object

properties:

federateECSIdentifier:

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

federatedECSProfile:

type: integer

servedEASList:

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

servedEESList:

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

#-------- Definition of types for name-containments ------

SubNetwork-ncO-EdgeNrm:

type: object

properties:

ECSFunction:

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

EdgeDataNetwork:

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

EASBundle:

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

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

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'

availableEdgeVirtualResources:

type: string

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

registrationInfo:

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

eASRequirementsRef:

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

eASAddress:

type: array

items:

type: string

relocationTriggerInfo:

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

relocationRejectByASP:

type: boolean

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

EASProfile-Single:

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

eASFunctionRef:

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

registrationInfo:

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

- $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'

sharedECSInfo:

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

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

EASRequirements-Single:

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'

eASSchedule:

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

eASFeature:

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

relocationPolicy:

type: string

description: any of enumrated value

enum:

- YES

- NO

- YESwNOTIFY

federationID:

type: string

eASDeploymentMonitor:

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

reservationJobRef:

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

EASResourceReservationJob-Single:

allOf:

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

- type: object

properties:

reservationLocation:

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

resourceReservationRequirement:

type: array

items:

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

requestedReservationExpiration:

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

resourceReservationStatus:

type: array

items:

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

EdgeFederation-Single:

allOf:

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

- type: object

properties:

participatingOPiD:

type: string

leadingOPiD:

type: string

federatedECSInfo:

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

OperatorEdgeFederation-Single:

allOf:

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

- type: object

properties:

federationID:

type: string

FederationExpiry:

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

leadingOPiD:

type: string

avaibleEDNList:

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

acceptedEDN:

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

OperatorEdgeDataNetwork-Single:

allOf:

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

- type: object

properties:

availableEASResource:

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

edgeDataNetworkRef:

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

EASBundle-Single:

allOf:

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

- type: object

properties:

bundleIdentifier:

type: string

bundledEASIdentifier:

type: string

bundleType:

type: string

mainEASIdentifier:

type: string

coordinatedEASDiscovery:

type: boolean

coordinatedACR:

type: boolean

eDNAffinity:

type: string

description: any of enumrated value

enum:

- STRONG

- WEAK

- PREFERRED

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

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'

EASProfile-Multiple:

type: array

items:

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

EdgeFederation-Multiple:

type: array

items:

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

OperatorEdgeFederation-Multiple:

type: array

items:

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

OperatorEdgeDataNetwork-Multiple:

type: array

items:

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

EASBundle-Multiple:

type: array

items:

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

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

resources-edgeNrm:

oneOf:

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

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

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

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

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

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

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

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

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

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

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

<CODE ENDS>

\*\*\* END OF CHANGE 1 \*\*\*