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

Hyderabad, India, 14 - 18 October 2024

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

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| ***Title:***  | Rel-19 CR TS 28.538 Correct the description of attributes |
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| ***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 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-17 (Release 17)Rel-18 (Release 18)Rel-19 (Release 19) Rel-20 (Release 20)* |
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| ***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.
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| ***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.
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| ***Consequences if not approved:*** | The definition of attributes will be inconsistent with those in TS 23.558. |
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| ***Clauses affected:*** | 5.1.15, 6.4.1 |
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|  | **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:*** |  |

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| **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.

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| **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: Stringmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: 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: Stringmultiplicity: 1..\*isOrdered: FalseisUnique: TruedefaultValue: NoneisNullable: False |
| eASREquirementsRef | This is the DN of EASRequirements. allowedValues: Not applicable | type: DNmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| eESFunctionRef | This is the DN of EESFunction. allowedValues: DN of the EESFunction MOI. | type: DNmultiplicity: 1..\*isOrdered: FalseisUnique: TruedefaultValue: NoneisNullable: 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: RegistrationInfomultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: 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: DateTimemultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| registrationID | This identifies particular EAS and EES registration. (see clause 8.4.3 and 8.4.4 in TS 23.558 [2]). | type: Stringmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: 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: Stringmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| edgeDataNetworkRef | This holds a list of DN of EdgeDataNetwork. | type: DNmultiplicity: 1..\*isOrdered: FalseisUnique: 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: N/AdefaultValue: 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: N/AdefaultValue: NoneisNullable: False |
| latitude | This defines the single latitude coordinate. | type: Floatmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| longitude | This defines the single longitude coordinate. | type: Floatmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: 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: N/AdefaultValue: 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: N/AdefaultValue: 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: N/AdefaultValue: 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: N/AdefaultValue: 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: N/AdefaultValue: 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: N/AdefaultValue: 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: N/AdefaultValue: NoneisNullable: 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: Stringmultiplicity: 1isOrdered: N/AisUnique: TruedefaultValue: NoneisNullable: 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: Stringmultiplicity: 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: FalseisUnique: YesdefaultValue: NoneisNullable: False |
| trackingAreaIdList | It represents the list of tracking areas within a PLMN.  | type: TAImultiplicity: 1..\*isOrdered: FalseisUnique: TruedefaultValue: NoneisNullable: False |
| servingPLMN | It specifies the PLMN to be served. | type: PLMNIdmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: 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: Stringmultiplicity: 1..\*isOrdered: FalseisUnique: TruedefaultValue: NoneisNullable: 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: NoneisNullable: False |
| eDNConnectionInfo | It defines the set of information needed to connect to an EDN. | type: EDNConnectionInfomultiplicity: 1..\*isOrdered: FalseisUnique: 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: N/AdefaultValue: 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: NoneisNullable: 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: defaultValue: NoneisNullable: False |
| affinityEAS | This parameter defines the EAS identifier with which the affinity is required. | type: Stringmultiplicity: 1..\*isOrdered: FalseisUnique: TruedefaultValue: NoneisNullable: False |
| antiAffinityEAS | This parameter defines the EAS identifier with which the anti-affinity is required. | type: Stringmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: 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: FalseisUnique: TruedefaultValue: FalseisNullable: False |
| virtualResource | This parameter defines the virtual resource requirements of an EAS. | type: VirtualResourcemultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: 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: N/AdefaultValue: 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: N/AdefaultValue: NoneisNullable: 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: Stringmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: 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: Stringmultiplicity: 1..\*isOrdered: FalseisUnique: TruedefaultValue: NoneisNullable: False |
| eESIdentifier | It identifies the EES, see EESID defined in clause 8.2.6 in 3GPP TS 23.558[2]. | type: Stringmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| eASFunctionRef | This is the DN of EASFunction. allowedValues: DN of the EASFunction MOI. | type: DNmultiplicity: 1..\*isOrdered: FalseisUnique: TruedefaultValue: NoneisNullable: False |
| serviceContinuitySupport | This parameter defines whether the EES supports service continuity, see 3GPP TS 23.558 | type: Boolenmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| eESservingLocation | It defines the serving location for an EES. | type: ServingLocationmultiplicity: 1..\*isOrdered: FalseisUnique: TruedefaultValue: NoneisNullable: False |
| eESFunctionRef | This is the DN of EESFunction. allowedValues: DN of the EESFunction MOI. | type: DNmultiplicity: 1..\*isOrdered: FalseisUnique: TruedefaultValue: NoneisNullable: False |
| aCID | Identifies the AC(s) that can be served by the EAS (See TS 23.558 [2]).allowedValues: N/A | type: Stringmultiplicity: 1..\*isOrdered: FalseisUnique: TruedefaultValue: NoneisNullable: 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: Stringmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: 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: Stringmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: 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: Durationmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| startTime | It defines the start time of the duration for which the EAS is available.allowedValues: N/A | type: DateTimemultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| endTime | It defines the send time of the duration for which the EAS is available.allowedValues: N/A | type: DateTimemultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: 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: GeoLocmultiplicity: 1..\*isOrdered: FalseisUnique: TruedefaultValue: NoneisNullable: 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: TopologicalServiceAreamultiplicity: 1..\*isOrdered: FalseisUnique: TruedefaultValue: NoneisNullable: 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: ENUMmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: 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: Stringmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: 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: Booleanmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: FalseisNullable: 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: Stringmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: 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: Integermultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: 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: ENUMmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| reservationLocation | This parameter defines the location where the resource needs to be reserved | type: ServingLocationmultiplicity: 1isOrdered: N/AisUnique: TruedefaultValue: NoneisNullable: False |
| resourceReservationRequirement | This parameter defines the resource requirements that needs to be reserved.  | type: ResourceReservationRequirementmultiplicity: 1..\*isOrdered: FalseisUnique: TruedefaultValue: NoneisNullable: 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: Stringmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: 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: Stringmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: 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: Integermultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| requestedReservationExpiration | This parameter defines the MnS consumer's requirememts for the validity period of the resource reservation. allowedValues: N/A | type: DateTimemultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| resourceReservationStatus | This parameter defines the status for the reserved resources.  | type: ResourceReservationStatusmultiplicity: 1..\*isOrdered: FalseisUnique: TruedefaultValue: NoneisNullable: False |
| resourceId | It identifies a reserved resource.  | type: Stringmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: 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: Enummultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: 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: RelocationTriggerInfomultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: LOCKEDisNullable: 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: ENUMmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: Not isNullable: False |
| futuristicTriggerTime | This attribute defines a time stamp in future at which the EAS relocation will be initiated.allowedValues: N/A | type: DateTimemultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: 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: Booleanmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: FALSEisNullable: False |
| relocationPolicy | This attribute described the EAS relocation policies from the ASP.YES: This dictates that an EAS can be relocated as and when requiredNO: This dictates an EAS cannot be relocated at allYESwNOTIFY: This indicates that an EAS can be relocated with a prior notification allowedValues: "YES", "NO", “YESwNOTIFY”Editors Note: The notification mechanism in FFS. | type: ENUMmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: 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: Stringmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: 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: Stringmultiplicity: 1isOrdered: N/AisUnique: TruedefaultValue: NoneisNullable: False |
| participatingOPiD | This identifies the PO.allowedValues: N/A | type: Stringmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| leadingOPiD | This identifies the LO.allowedValues: N/A | type: Stringmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| federationID | This identifies the particular federation created.allowedValues: N/A | type: Stringmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| FederationExpiry | This defines the time post which the federation relationship shall expire.allowedValues: N/A | type: DateTimemultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| initiationTime | Date and time of the federation initiated by the Leading operator.allowedValues: N/A | type: DateTimemultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| acceptedEDNList | It provides the list of EDN that are accepted by the LO.allowedValues: N/A | type: DNmultiplicity: 1…\*isOrdered: FalseisUnique: TruedefaultValue: NoneisNullable: 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: VirtualResourcemultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| availableEASResource | This defines the available EAS in the shared EDN. This will be the DN of EASProfile.allowedValues: N/A | type: DNmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| avaibleEDNList | This defines information related with offered EDN available with PO.allowedValues: N/A | type: AvailableEDNListmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| federationID | This defines the federation ID provided by the PO to LO at the time of federation establishment.allowedValues: N/A | type: Stringmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| reservationID | This identifies the reserved block of resources. This will be the DN of EASResourceReservationJob.allowedValues: N/A | type: DNmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: 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: DNmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| federatedPOPIdentifier | The identifier of the participating operator | type: Stringmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| federatedECSProfile | The information related with ECS Profile. See clause 8.2.12 of [2]. | type: Stringmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| servedEASList | This defines the list of EAS(s) available with the partner ECS. This specifies the DN of EASFunction instance. | type: DNmultiplicity: \*isOrdered: FalseisUnique: TruedefaultValue: NoneisNullable: False |
| servedEESList | This defines the list of EES(s) available with the partner ECS. This specifies the DN of EESFunction instance. | type: DNmultiplicity: \*isOrdered: FalseisUnique: TruedefaultValue: NoneisNullable: False |
| sharedECSInfo | This defines the ECS(s) belonging to P-OP that can be used in case of roaming and federation | type: FederatedECSInfomultiplicity: \*isOrdered: FalseisUnique: TruedefaultValue: NoneisNullable: False |
| federatedECSInfo | This defines the information related with shared ECS | type: FederatedECSInfomultiplicity: \*isOrdered: FalseisUnique: TruedefaultValue: NoneisNullable: False |
| availableEDN | This defines the available EDN. | type: DNmultiplicity: 1isOrdered: FalseisUnique: TruedefaultValue: NoneisNullable: 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: ProcessMonitormultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| bundleIdentifier | Identifier of the bundle. See clause 8.2.2 [2] | type: Stringmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| bundledEASIdentifier | List of EAS identifier associated with the EAS bundle. See clause 8.2.2 [2]. | type: Stringmultiplicity: \*isOrdered: FalseisUnique: TruedefaultValue: NoneisNullable: False |
| bundleType | Type of the EAS bundle. See clause 8.2.2 [2].Allowed Values: DIRECT, PROXY | type: ENUMmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| mainEASIdentifier | Indicate which EAS in a bundle takes the main EAS service role. See clause 8.2.2 [2]. | type: Stringmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: 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: Booleanmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: FalseisNullable: 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: Booleanmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: 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: ENUMmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| EASBundle.eASFunctionRef | This indicates the constituent EAS of the EAS bundle. | type: DNmultiplicity: \*isOrdered: FalseisUnique: TruedefaultValue: NoneisNullable: False |
| EASBundle.EESFunctionRef | This indicate the related EES with the EAS bundle | type: DNmultiplicity: \*isOrdered: FalseisUnique: TruedefaultValue: NoneisNullable: False |
| EASBundle. eASRequirementsRef | This indicates the requirements for each constituent EAS in the bundle. | type: DNmultiplicity: \*isOrdered: FalseisUnique: TruedefaultValue: NoneisNullable: False |
| EASFunction. eASBundleRef | This indicates the EAS bundles in which the EAS is included. See clause 8.2.2 [2]. | type: DNmultiplicity: \*isOrdered: FalseisUnique: TruedefaultValue: NoneisNullable: False |
| EESFunction. eASBundleRef | This indicates the related EAS bundles with the EES. See clause 8.2.2 [2].  | type: DNmultiplicity: \*isOrdered: FalseisUnique: TruedefaultValue: NoneisNullable: False |
| eASBundleInfo | This defines the bundle relation information for the EAS | type: EASBundleInfomultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: TrueisNullable: 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: Booleanmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: TrueisNullable: False |
| allowedBundelref | This defines the EAS bundles where this EAS can be placed.  | type: DNmultiplicity: \*isOrdered: FalseisUnique: TruedefaultValue: NoneisNullable: 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

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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: '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 \*\*\*