**3GPP TSG-SA5 Meeting #142-e *S5-222338***

**e-meeting, 4-12 April 2022**

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| --- |
| *CR-Form-v12.1* |
| **CHANGE REQUEST** |
|  |
|  | **28.538** | **CR** | **draftCR** | **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 |  | Core Network | **X** |

|  |
| --- |
|  |
| ***Title:***  | Update ECM NRM stage 2 |
|  |  |
| ***Source to WG:*** | Huawei |
| ***Source to TSG:*** | S5 |
|  |  |
| ***Work item code:*** | eECM |  | ***Date:*** | 2022-3-25 |
|  |  |  |  |  |
| ***Category:*** | **F** |  | ***Release:*** | *Rel-18* |
|  | *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:*** | Fix some issues in ECM NRM,1, the statement for EASFunction IOC is inherited from ManagedFunction IOC is missing.2, the current definition of softwareImageInfo, only contains minimum Disk, minimumRAM and swImageRef, which are not enough for deploying a VNF (why other information, such as container format, discFormat, size, operatingSystem as defined in ETSI NFV IFA011, is not included), suggest to add more information to align with ETSI NFV. 3, the current definition of virtualResource, only contains virtualMemory and virtualDisk, which are not enough for deploying a VNF (why other information, such as virtualCpu, virtualStorage, monitoringParameter and cpd as defined in ETSI NFV IFA011, is not included), suggest to add more information to align with ETSI NFV.. 4, multiplicity of serviceContinuity and serviceContinuitySupport should be 1.  |
|  |  |
| ***Summary of change:*** | Update the ECM NRM. |
|  |  |
| ***Consequences if not approved:*** | Not applicable for implementation. |
|  |  |
| ***Clauses affected:*** | 6.3, 6.4 |
|  |  |
|  | **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:*** |  |

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

6.3 Class definition

6.3.1 EASFunction

6.3.1.1 Definition

This IOC represent the properties of a EAS in a 3GPP network. For more information about EAS, see 3GPP TS 23.558.

6.3.1.2 Attributes

The EASFunction IOC includes attributes inherited from ManagedFunction IOC (defined in TS 28.622 [4]) and the following attributes:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute name** | **Support Qualifier** | **isReadable** | **isWritable** | **isInvariant** | **isNotifyable** |
| eASIdentifier | M | T | T | F | T |
| eASAddress | M | T | T | F | T |
| eESAddress | M | T | T | F | T |
| **Attribute related to role** |  |  |  |  |  |
| eASRequirementsRef | M | T | T | F | T |
|  |  |  |  |  |  |
|  |  |  |  |  |  |

6.3.1.3 Attribute constraints

None.

6.3.1.4 Notifications

Editor's note: The content of this clause will be provided in the next version of the specification.

6.3.2 EASRequirements

6.3.2.1 Definition

This represent the requirements needed to deploy EAS(s).

6.3.2.2 Attributes

The EASRequirements IOC includes attributes inherited from Top IOC (defined in TS 28.622[4]) and the following attributes:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute name** | **Support Qualifier** | **isReadable** | **isWritable** | **isInvariant** | **isNotifyable** |
| requiredEASservingLocation | M | T | F | F | T |
| softwareImageInfo | M | T | F | F | T |
| affinityAntiAffinity | M | T | F | F | T |
| serviceContinuity | M | T | F | F | T |
| virtualResource | M | T | F | F | T |

Editor's note: which entity is responsible for creating VNFD based on the deployment requirement as shown in the above figure (e.g., softwareImageInfo and virtualResource) is FFS.

6.3.2.3 Attribute constraints

None.

6.3.2.4 Notifications

Editor's note: The content of this clause will be provided in the next version of the specification.

6.3.3 ServingLocation <<dataType>>

6.3.3.1 Definition

This datatype represents the location which is to be served by the node.

6.3.3.2 Attributes

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute name** | **Support Qualifier** | **isReadable** | **isWritable** | **isInvariant** | **isNotifyable** |
| geographicalLocation | CM | T | F | F | T |
| topologicalLocation | CM | T | T | F | T |
|  |  |  |  |  |  |

6.3.3.3 Attribute constraints

|  |  |
| --- | --- |
| **Name** | **Definition** |
| geographicalLocation Support Qualifier | Condition: If the serving location is defined as Geographical Service Area [2]. |
| topologicalLocation Support Qualifier | Condition: If the serving location is defined as Topological Service Area [2]. |

NOTE: Only one of the attributes is needed.

6.3.3.4 Notifications

Editor's note: The content of this clause will be provided in the next version of the specification.

6.3.4 GeoLoc <<dataType>>

6.3.4.1 Definition

This datatype represent the geographical location.

6.3.4.2 Attributes

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute name** | **Support Qualifier** | **isReadable** | **isWritable** | **isInvariant** | **isNotifyable** |
| geographicalCoordinates | CM | T | T | F | T |
| civicLocations | CM | T | T | F | T |
|  |  |  |  |  |  |

6.3.4.3 Attribute constraints

|  |  |
| --- | --- |
| **Name** | **Definition** |
| geographicalCoordinates Support Qualifier | Condition: If the serving location is defined as geographical coordinates [2]. |
| civicLocationsSupport Qualifier | Condition: If the serving location is defined as civic locations [2]. |

NOTE: Only one of the attributes is needed.

6.3.4.4 Notifications

Editor's note: The content of this clause will be provided in the next version of the specification.

6.3.5 ECSFunction

6.3.5.1 Definition

This IOC represents the ECS functionality for supporting Edge Computing. For more information about the ECS, see 3GPP TS 23.558 [2].

6.3.5.2 Attributes

The ECSFunction IOC includes attributes inherited from ManagedFunction IOC (defined in TS 28.622 [4]) and the following attributes:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute name** | **Support Qualifier** | **isReadable** | **isWritable** | **isInvariant** | **isNotifyable** |
| ecsAddress | M | T | T | F | T |
| providerIdentifier | O | T | T | F | T |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
| **Attribute related to role** |  |  |  |  |  |
| edgeDataNetworkRef | M | T | T | F | T |
| eESFunctonRef | M | T | T | F | T |

6.3.5.3 Attribute constraints

None.

6.3.6 EDNConnectionInfo <<datatype>>

6.3.6.1 Definition

This datatype represent the EDN connection information.

6.3.6.2 Attributes

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute name** | **Support Qualifier** | **isReadable** | **isWritable** | **isInvariant** | **isNotifyable** |
| dNN | M | T | T | F | T |
| eDNServiceArea | M | T | T | F | T |

6.3.6.3 Attribute constraints

None.

6.3.7 TopologicalServiceArea <<dataType>>

6.3.7.1 Definition

This datatype represents the topological service area.

6.3.7.2 Attributes

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute name** | **Support Qualifier** | **isReadable** | **isWritable** | **isInvariant** | **isNotifyable** |
| cellIDList | CM | T | T | F | T |
| trackingAreaIdList | CM | T | T | F | T |
| servingPLMN | CM | T | T | F | T |

6.3.7.3 Attribute constraints

|  |  |
| --- | --- |
| **Name** | **Definition** |
| cellIDList Support Qualifier | Condition: If the serving location is defined as cell IDs [2]. |
| trackingAreaIdList Support Qualifier | Condition: If the serving location is defined as tracking area IDs [2]. |
| servingPLMN Support Qualifier | Condition: If the serving location is defined as PLMN ID [2]. |

NOTE: Only one of the attributes is needed.

6.3.8 GeographicalCoordinates <<dataType>>

6.3.8.1 Definition

This datatype represents the geographical coordinates.

6.3.8.2 Attributes

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute name** | **Support Qualifier** | **isReadable** | **isWritable** | **isInvariant** | **isNotifyable** |
| latitude | M | T | T | F | T |
| longitude | M | T | T | F | T |

6.3.8.3 Attribute constraints

None.

6.3.9 SoftwareImageInfo <<dataType>>

6.3.9.1 Definition

This datatype represents the software image information.

6.3.9.2 Attributes

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute name** | **Support Qualifier** | **isReadable** | **isWritable** | **isInvariant** | **isNotifyable** |
| minimumDisk | M | T | T | F | T |
| minimumRAM | M | T | T | F | T |
| diskFormat | M | T | T | F | T |
| operatingSystem | M | T | T | F | T |
| **Attribute related to role** |  |  |  |  |  |
| swImageRef | M | T | T | F | T |

6.3.9.3 Attribute constraints

None.

6.3.10 EdgeDataNetwork

6.3.10.1 Definition

This IOC represent the EDN information for supporting Edge Computing. For more information about EDN, see 3GPP TS 23.558 [2].

6.3.10.2 Attributes

The EdgeDataNetwork IOC includes attributes inherited from Top IOC (defined in TS 28.622[4]) and the following attributes:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute name** | **Support Qualifier** | **isReadable** | **isWritable** | **isInvariant** | **isNotifyable** |
| ednIdentifier | M | T | T | F | T |
| eDNConnectionInfo | M | T | T | F | T |

6.3.10.3 Attribute constraints

None.

6.3.10.4 Notifications

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

6.3.11 AffinityAntiAffinity <<datatype>>

6.3.11.1 Definition

This datatype represent the affinity and anti-affinity requirements of the EAS with other EAS on the same EDN.

6.3.11.2 Attributes

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute name** | **Support Qualifier** | **isReadable** | **isWritable** | **isInvariant** | **isNotifyable** |
| affinityEAS | M | T | F | F | T |
| antiAffinityEAS | M | T | T | F | T |
|  |  |  |  |  |  |

6.3.11.3 Attribute constraints

None.

6.3.12 VirtualResource <<datatype>>

6.3.12.1 Definition

This datatype represent the virtual resource requirements of an EAS.

6.3.12.2 Attributes

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute name** | **Support Qualifier** | **isReadable** | **isWritable** | **isInvariant** | **isNotifyable** |
| virtualMemory | M | T | T | F | T |
| virtualDisk | M | T | T | F | T |
| virtualCPU | M | T | T | F | T |

6.3.12.3 Attribute constraints

None.

6.3.13 EESFunction

6.3.13.1 Definition

This IOC represent the properties of a EES in a 3GPP network. For more information about EES, see 3GPP TS 23.558.

6.3.13.2 Attributes

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute name** | **Support Qualifier** | **isReadable** | **isWritable** | **isInvariant** | **isNotifyable** |
| eESIdentifier | M | T |  | F | T |
| eESServingLocation | M | T | T | F | T |
| eESAddress | M | T | T | F | T |
|  |  |  |  |  |  |
| serviceContinuitySupport | M | T | T | F | T |
| **Attribute related to role** |  |  |  |  |  |
| eASFunctonRef | M | T | T | F | T |

6.3.13.3 Attribute constraints

None.

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 |
| 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: 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: 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: 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/A**isNullable: 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: 1isOrdered: 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 |
| 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: 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: 1isOrdered: 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 |
| eESFunctionRef | This is the DN of EESFunction. allowedValues: DN of the EESFunction MOI. | type: DNmultiplicity: 1..\*isOrdered: N/AisUnique: TruedefaultValue: NoneisNullable: False |