|  |
| --- |
| **ECOMP Model Report**  Resource  Version 1.0 ● Proposed |
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# **R****esource**

*Package in package 'ECOMP Class Model'*

Resource

Version 1.0 Phase 1.0 Proposed

KS0567 created on 2/25/2016. Last modified 2/25/2016

## **ONAP Item Layers - High Level diagram**

*Class diagram in package 'Resource'*

From an ONAP layering perspective,

* services are made up one or more service components,
* service components are made up of resources where a resource can be a vnf,
* vnfs are made up of vnf components,
* given vnfs are onboarded, a given vnfc can only be related to one vnf,
* it is debatable if a service can be made up of a service.
* services do not have a direct relationship to resources - only through service components,
* the service / service component and vnf/vnf component is a 'pattern. The exception is that a service component has a zero to many relationship to service while the vnf component has is related to exactly one vnf.

ONAP Item Layers - High Level

Version 1.0

KS0567 created on 10/31/2017. Last modified 11/7/2017



ONAP Item Layers - High Level

## **Resource Instance Types diagram**

*Class diagram in package 'Resource'*

The Resource is where *the action is* for Network Function Virtualization (NFV). A ResourceInstance (as well as a ResourceCatalogItem) can be:

* a controller (application, infrastructure, or network),
* a virtual function, including a virtual network function,
* a virtual machine or container,
* at some point, perhaps a physical resource, as well as
* an entitlement.

Virtual functions are managed via controllers, and run within some virtual machine or container on some commodity hardware in some cloud and data center.

A Resource can have some number of functions grouped together for which entitlements can be managed.

Resource Instance Types

Version 1.0

KS0567 created on 11/16/2015. Last modified 10/31/2017



Resource Instance Types

## **Resource Instance Interrelationships diagram**

*Class diagram in package 'Resource'*

As can be seen in the diagram, controllers, license keys, vnf instances, and entitlement instances are interrelated. controllers control and manage vnf instances. License keys provide proof of authorization for both vnfs and controlers, and similarly entitlements provide rights to use for both vnf instances and controllers.

Resource Instance Interrelationships

Version 1.0

KS0567 created on 10/28/2016. Last modified 11/7/2017



Resource Instance Interrelationships

## **Resource Details diagram**

*Class diagram in package 'Resource'*

Similar to the product and service characteristic pattern, resources can have some number of characteristics (attributes). These characteristics per ASDC design can be common, meaning all resources have them, or additional, meaning unique to this resource. These characteristics can be modeled as a CharacteristicSpecification. Each Resource CatalogItem will have some number of CharacteristicSpecifications. A CharacteristicSpecification can have zero or more possible CharacteristicSpecValues of which a CharacteristicValue will select one. CharacteristicSpecifications can have CharacteristicSpecifications, meaning they can be grouped together in some meaningful way.

Resource Details

Version 1.0

KS0567 created on 3/28/2016. Last modified 10/12/2017



Resource Details

## **ONAP VNF- Network View diagram**

*Class diagram in package 'Resource'*

ONAP VNF- Network View

Version 1.0

KS0567 created on 10/31/2017. Last modified 11/7/2017



ONAP VNF- Network View

## **ONAP VNFD View diagram**

*Class diagram in package 'Resource'*

ONAP VNFD View

Version 1.0

am803u created on 10/20/2017. Last modified 11/7/2017



ONAP VNFD View

## **Resource Types, Catalog Items, and Instances diagram**

*Class diagram in package 'Resource'*

ResourceCatalogItems are made available as ResourceInstances. The association is made at the subclass, given a VNFCatalogItem should not be made available at a PNFInstance, which would be allowable if the relationship was made at the Resource level.

Resource Types, Catalog Items, and Instances

Version 1.0

KS0567 created on 6/19/2017. Last modified 11/7/2017



Resource Types, Catalog Items, and Instances

## **vNF Deployment diagram**

*Class diagram in package 'Resource'*

vNF Deployment

Version 1.0

mm7817 created on 7/13/2016. Last modified 3/15/2017



vNF Deployment

## **AllottedResource**

*Class in package 'Resource'*

A slice of a resource for a service, including the configuration for the VNF appropriate for the respective service or capacity on a network element.

A VNF may have no allotted resources, meaning the resource is not shared.

Includes capacity, bandwidth

AllottedResource

Version 1.0 Phase 1.0 Proposed

KS0567 created on 10/23/2017. Last modified 10/26/2017

Extends ServiceComponentDesc (ServiceComponentCatalogItem)

| **OUTGOING STRUCTURAL RELATIONSHIPS** |
| --- |
| Generalization from AllottedResource to ServiceComponentDesc (ServiceComponentCatalogItem)  [ Direction is 'Source -> Destination'. ] |

## **Application Controller**

*Class in package 'Resource'*

VF's which are managed by application controller are: web servers, database servers, media servers, business support systems (BSS), Content Distribution and Delivery (CDN). These application VF's may be managed by one (1) or more application controllers.

Application Controller

Version 1.0 Phase 1.0 Proposed

KS0567 created on 10/27/2015. Last modified 11/9/2016

Extends ControllerInstance (Management Software)

| **OUTGOING STRUCTURAL RELATIONSHIPS** |
| --- |
| Generalization from Application Controller to ControllerInstance (Management Software)  [ Direction is 'Source -> Destination'. ] |

## **CPDesc**

*Class in package 'Resource'*

A **Cpd** information element describes network connectivity to a compute resource or a VL. This is an abstract class used as parent for the various Cpd classes.

References:

ETSI GS NFV-IFA 011 V2.1.3

CPDesc

Version 1.0 Phase 1.0 Proposed

am803u created on 10/19/2017. Last modified 11/1/2017

| **INCOMING STRUCTURAL RELATIONSHIPS** |
| --- |
| Generalization from VNFCCPDesc (VNFC Connection Point Desc) (VDUCPD) to CPDesc  [ Direction is 'Source -> Destination'. ] |

| **ATTRIBUTES** |
| --- |
| addressData : AddressData Public  Multiplicity: ( [0..\*], Allow duplicates: 0, Is ordered: False )  Provides information on the addresses to be assigned to the CP(s) instantiated from this CPD.  References:  ETSI GS NFV-IFA 011 V2.1.3  tosca-nfv-YAML-v1.0-wd05-rev02 (address\_data)  [ Is static False. Containment is Not Specified. ] |

|  |
| --- |
| cpRole : String Public  Multiplicity: ( [0..1], Allow duplicates: 0, Is ordered: False )  Identifies the role of the port in the context of the traffic flow patterns in the VNF or parent NS.  For example a VNF with a tree flow pattern within the VNF will have legal cpRoles of ROOT and LEAF.  References:  ETSI GS NFV-IFA 011 V2.1.3  tosca-nfv-YAML-v1.0-wd05-rev02 (role)  [ Is static False. Containment is Not Specified. ] |

|  |
| --- |
| description : String Public  Multiplicity: ( [0..1], Allow duplicates: 0, Is ordered: False )  Provides human-readable information on the purpose of the CP (e.g. CP for control plane traffic).  References:  ETSI GS NFV-IFA 011 V2.1.3  tosca-nfv-YAML-v1.0-wd05-rev02  [ Is static False. Containment is Not Specified. ] |

|  |
| --- |
| layerProtocol : LayerProtocol Public  Identifies which protocol the CP uses for connectivity purposes (Ethernet, MPLS, ODU2, IPV4, IPV6, Pseudo-Wire, etc.).  References:  ETSI GS NFV-IFA 011 V2.1.3  tosca-nfv-YAML-v1.0-wd05-rev02  [ Is static False. Containment is Not Specified. ] |

## **Container Engine 2**

*Class in package 'Resource'*

Container Engine 2

Version 1.0 Phase 1.0 Proposed

KS0567 created on 12/21/2016. Last modified 12/21/2016

Extends Infrastructure Controller

| **OUTGOING STRUCTURAL RELATIONSHIPS** |
| --- |
| Generalization from Container Engine 2 to Infrastructure Controller  [ Direction is 'Source -> Destination'. ] |

| **ASSOCIATIONS** | |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) Container Engine 2 | Target: Public (Class) Virtual Machine (Type 1 - vServer) |

|  |  |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) Docker or Linux ContainerInstance (Type 2)  Cardinality: [0..\*] | Target: Public (Class) Container Engine 2  Cardinality: [1] |

## **Container Infrastructure**

*Class in package 'Resource'*

e.g. Docker, Kubernetes

Container Infrastructure

Version 1.0 Phase 1.0 Proposed

MM7817 created on 7/6/2016. Last modified 7/13/2016

| **ASSOCIATIONS** | |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) Container Infrastructure  Cardinality: [1] | Target: Public (Class) PNFnstance  Cardinality: [1..\*] |

|  |  |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) Docker or Linux ContainerInstance (Type 2)  Cardinality: [1..\*] | Target: Public (Class) Container Infrastructure  Cardinality: [1] |

## **ContainerEngine**

*Class in package 'Resource'*

ContainerEngine

Version 1.0 Phase 1.0 Proposed

KS0567 created on 12/21/2016. Last modified 12/21/2016

Extends Infrastructure Controller

| **OUTGOING STRUCTURAL RELATIONSHIPS** |
| --- |
| Generalization from ContainerEngine to Infrastructure Controller  [ Direction is 'Source -> Destination'. ] |

| **ASSOCIATIONS** | |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) Docker or Linux Container Instance (Type 3 - Bare Metal)  Cardinality: [1..\*] | Target: Public (Class) ContainerEngine  Cardinality: [1] |

|  |  |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) pServer (host) | Target: Public (Class) ContainerEngine |

## **ControllerInstance (Management Software)**

*Class in package 'Resource'*

A Controller is a type of Resource. Controllers also manage Resources. As an example, an Application Controller can manage zero or more Virtual Function type Resources, and has some capacity as to the number it can manage. There are several types of controllers, namely Application Controllers, Infrastructure Controllers, and Network Controllers.

ControllerInstance (Management Software)

Version 1.0 Phase 1.0 Proposed

KS0567 created on 10/27/2015. Last modified 1/5/2017

Extends ResourceInstance

| **OUTGOING STRUCTURAL RELATIONSHIPS** |
| --- |
| Generalization from ControllerInstance (Management Software) to ResourceInstance  [ Direction is 'Source -> Destination'. ] |

|  |
| --- |
| Generalization from ControllerInstance (Management Software) to ResourceInstance  [ Direction is 'Source -> Destination'. ] |

| **INCOMING STRUCTURAL RELATIONSHIPS** |
| --- |
| Generalization from Network Controller to ControllerInstance (Management Software)  [ Direction is 'Source -> Destination'. ] |

|  |
| --- |
| Generalization from Infrastructure Controller to ControllerInstance (Management Software)  [ Direction is 'Source -> Destination'. ] |

|  |
| --- |
| Generalization from Application Controller to ControllerInstance (Management Software)  [ Direction is 'Source -> Destination'. ] |

|  |
| --- |
| Generalization from «SdnController» SdnGc to ControllerInstance (Management Software)  [ Direction is 'Source -> Destination'. ] |

| **ASSOCIATIONS** | |
| --- | --- |
| Association (direction: Unspecified)  Controller Manages | |
| Source: Public (Class) ControllerInstance (Management Software)  Cardinality: [1] | Target: Public (Class) ResourceInstance  Cardinality: [0..\*] |

|  |  |
| --- | --- |
| Association (direction: Unspecified)  Controller Manages | |
| Source: Public (Class) ControllerInstance (Management Software)  Cardinality: [1] | Target: Public (Class) ResourceInstance  Cardinality: [0..\*] |

|  |  |
| --- | --- |
| Association (direction: Unspecified)  EntitlementInstanceSpecifiesRightToUse | |
| Source: Public (Class) ControllerInstance (Management Software)  Cardinality: [0..\*] | Target: Public (Class) EntitlementInstance  Cardinality: [0..\*] |

|  |  |
| --- | --- |
| Association (direction: Unspecified)  ControllerManages | |
| Source: Public (Class) ControllerInstance (Management Software) | Target: Public (Class) VNFInstance |

|  |  |
| --- | --- |
| Association (direction: Unspecified)  LicenseKeyInstanceProvidesProofOfAuthorizationFor | |
| Source: Public (Class) LicenseKeyInstance  Cardinality: [0..\*] | Target: Public (Class) ControllerInstance (Management Software)  Cardinality: [0..\*] |

|  |  |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) PNFnstance | Target: Public (Class) ControllerInstance (Management Software) |

## **CustomerLicenseKey**

*Class in package 'Resource'*

CustomerLicenseKey

Version 1.0 Phase 1.0 Proposed

KS0567 created on 8/17/2017. Last modified 8/23/2017

| **ASSOCIATIONS** | |
| --- | --- |
| Association (direction: Unspecified)  ProductHas | |
| Source: Public (Class) CustomerLicenseKey  Cardinality: [0..\*] | Target: Public (Class) VNFInstance  Cardinality: [0..1] |

## **Docker or Linux Container Instance**

*Class in package 'Resource'*

A 'type' of a container.

Docker or Linux Container Instance

Version 1.0 Phase 1.0 Proposed

mm7817 created on 7/13/2016. Last modified 9/23/2016

| **ASSOCIATIONS** | |
| --- | --- |
| Association (direction: Unspecified)  which runs containers | |
| Source: Public (Class) Docker or Linux Container Instance  Cardinality: [1..\*] | Target: Public (Class) Virtual Machine (Type 1 - vServer)  Cardinality: [1] |

|  |  |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) VNFC Instance  Cardinality: [1] | Target: Public (Class) Docker or Linux Container Instance  Cardinality: [1] |

## **Docker or Linux Container Instance (Type 3 - Bare Metal)**

*Class in package 'Resource'*

Docker or Linux Container Instance (Type 3 - Bare Metal)

Version 1.0 Phase 1.0 Proposed

mm7817 created on 7/13/2016. Last modified 3/3/2017

| **ASSOCIATIONS** | |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) Docker or Linux Container Instance (Type 3 - Bare Metal)  Cardinality: [1..\*] | Target: Public (Class) ContainerEngine  Cardinality: [1] |

|  |  |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) Docker or Linux Container Instance (Type 3 - Bare Metal)  Cardinality: [1..\*] | Target: Public (Class) pServer (host)  Cardinality: [1..] |

|  |  |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) VNFC Instance  Cardinality: [1] | Target: Public (Class) Docker or Linux Container Instance (Type 3 - Bare Metal)  Cardinality: [1] |

## **Docker or Linux ContainerInstance (Type 2)**

*Class in package 'Resource'*

Hypervisor managing VM, container running on the VM.

A Virtual Machine/Container is the environment that a given virtual (network) function runs. VMs are managed by Infrastructure Controllers.

For ECOMP purposes, 'ContainerInstance' currently refers to a deployed (usually on a VM) docker image.

Docker or Linux ContainerInstance (Type 2)

Version 1.0 Phase 1.0 Proposed

ks0567 created on 10/28/2015. Last modified 5/24/2017

| **ASSOCIATIONS** | |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) Docker or Linux ContainerInstance (Type 2)  Cardinality: [0..\*] | Target: Public (Class) Container Engine 2  Cardinality: [1] |

|  |  |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) Docker or Linux ContainerInstance (Type 2)  Cardinality: [0..\*] | Target: Public (Class) VM Virtual Machine  Cardinality: [1] |

|  |  |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) Docker or Linux ContainerInstance (Type 2)  Cardinality: [1..\*] | Target: Public (Class) pServer (host)  Cardinality: [1] |

|  |  |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) Docker or Linux ContainerInstance (Type 2)  Cardinality: [1..\*] | Target: Public (Class) Virtual Machine (Type 1 - vServer)  Cardinality: [1] |

|  |  |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) Docker or Linux ContainerInstance (Type 2)  Cardinality: [1..\*] | Target: Public (Class) Container Infrastructure  Cardinality: [1] |

|  |  |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) VNFInstance  Cardinality: [1..\*] | Target: Public (Class) Docker or Linux ContainerInstance (Type 2)  Cardinality: [1] |

|  |  |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) l-interface  Cardinality: [1..\*] | Target: Public (Class) Docker or Linux ContainerInstance (Type 2)  Cardinality: [1] |

|  |  |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) l-interface  Cardinality: [1..\*] | Target: Public (Class) Docker or Linux ContainerInstance (Type 2)  Cardinality: [1] |

|  |  |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) VNFC Instance  Cardinality: [1] | Target: Public (Class) Docker or Linux ContainerInstance (Type 2)  Cardinality: [1] |

|  |  |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) l-interface  Cardinality: [1..\*] | Target: Public (Class) Docker or Linux ContainerInstance (Type 2)  Cardinality: [1] |

|  |  |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) VirtualisationContainer (ETSI) | Target: Public (Class) Docker or Linux ContainerInstance (Type 2) |

## **ElementGroup**

*Class in package 'Resource'*

ElementGroup

Version 1.0 Phase 1.0 Proposed

KS0567 created on 11/6/2017. Last modified 11/6/2017

| **ATTRIBUTES** |
| --- |
| Strategy : enum Private  [ Is static False. Containment is Not Specified. ] |

| **ASSOCIATIONS** | |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) ElementGroup | Target: Public (Class) VNFDesc (VNFCatalogItem) |

|  |  |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) ElementGroup | Target: Public (Class) VNFDesc (VNFCatalogItem) |

|  |  |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) ElementGroup | Target: Public (Class) ServiceComponentDesc (ServiceComponentCatalogItem) |

|  |  |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) ElementGroup | Target: Public (Class) VNFCDesc (VDU) (VNFCCatalogItem) |

## **EntitilementCatalogItem**

*Class in package 'Resource'*

EntitilementCatalogItem

Version 1.0 Phase 1.0 Proposed

KS0567 created on 11/2/2017. Last modified 11/2/2017

Extends ResourceCatalogItem

| **OUTGOING STRUCTURAL RELATIONSHIPS** |
| --- |
| Generalization from EntitilementCatalogItem to ResourceCatalogItem  [ Direction is 'Source -> Destination'. ] |

## **EntitlementInstance**

*Class in package 'Resource'*

Specific AT&T use rights for the software as described by the license. The use rights may be quantified by various metrics: # users, # software instances, # units. Customer RTU is within the customer subscription. Entitlement is related to how we purchase the software from the supplier, 1 RTU may equate to 5 instances of the software. License Keys are treated as resources also and follow the same Zero-many relationship to vF instances. Either no key, universal key, or unique key per instance required.

EntitlementInstance

Version 1.0 Phase 1.0 Proposed

KS0567 created on 11/12/2015. Last modified 3/24/2017

Extends ResourceInstance

| **OUTGOING STRUCTURAL RELATIONSHIPS** |
| --- |
| Aggregation from EntitlementInstance to Resource/Supplier partner License  [ Name is Resource/SupplierPartnerLicenseHas. Direction is 'Source -> Destination'. ] |

|  |
| --- |
| Aggregation from EntitlementInstance to Metrics  [ Direction is 'Source -> Destination'. ] |

|  |
| --- |
| Generalization from EntitlementInstance to ResourceInstance  [ Direction is 'Source -> Destination'. ] |

|  |
| --- |
| Generalization from EntitlementInstance to ResourceInstance  [ Direction is 'Source -> Destination'. ] |

| **ATTRIBUTES** |
| --- |
| ResourceDisplayName : String Private  [ Is static False. Containment is Not Specified. ] |

|  |
| --- |
| ResourceSystemName : int Private  [ Is static False. Containment is Not Specified. ] |

|  |
| --- |
| UUID : String Private  [ Is static False. Containment is Not Specified. ] |

| **ASSOCIATIONS** | |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) EntitlementInstance  Cardinality: [1..\*] | Target: Public (Class) SoftwareLicense  Cardinality: [1] |

|  |  |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) EntitlementInstance | Target: Public (Class) Place |

|  |  |
| --- | --- |
| Association (direction: Unspecified)  EntitlementInstanceSpecifiiesRightToUse | |
| Source: Public (Class) VNFInstance  Cardinality: [0..\*] | Target: Public (Class) EntitlementInstance  Cardinality: [0..\*] |

|  |  |
| --- | --- |
| Association (direction: Unspecified)  EntitlementInstanceSpecifiesRightToUse | |
| Source: Public (Class) ControllerInstance (Management Software)  Cardinality: [0..\*] | Target: Public (Class) EntitlementInstance  Cardinality: [0..\*] |

## **FeatureGroupItem**

*Class in package 'Resource'*

A feature group is a container for defining 1 or more capabilities offered by a collection of software and/or hardware.

FeatureGroupItem

Version 1.0 Phase 1.0 Proposed

KS0567 created on 11/16/2015. Last modified 11/2/2017

| **OUTGOING STRUCTURAL RELATIONSHIPS** |
| --- |
| Aggregation from FeatureGroupItem to ResourceInstance  [ Name is ResourceContains. Direction is 'Source -> Destination'. ] |

| **ASSOCIATIONS** | |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) LicenseKeyFileCatlogItem | Target: Public (Class) FeatureGroupItem |

|  |  |
| --- | --- |
| Association (direction: Unspecified)  ResourceCatalogItemContains | |
| Source: Public (Class) ResourceCatalogItem  Cardinality: [1..] | Target: Public (Class) FeatureGroupItem  Cardinality: [0..\*] |

## **Hypervisor**

*Class in package 'Resource'*

Hypervisor

Version 1.0 Phase 1.0 Proposed

KS0567 created on 12/21/2016. Last modified 12/21/2016

Extends Infrastructure Controller

| **OUTGOING STRUCTURAL RELATIONSHIPS** |
| --- |
| Generalization from Hypervisor to Infrastructure Controller  [ Direction is 'Source -> Destination'. ] |

| **ASSOCIATIONS** | |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) Hypervisor  Cardinality: [1..\*] | Target: Public (Class) pServer (host)  Cardinality: [1] |

|  |  |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) Virtual Machine (Type 1 - vServer)  Cardinality: [1..\*] | Target: Public (Class) Hypervisor  Cardinality: [1] |

## **Infrastructure Controller**

*Class in package 'Resource'*

Manages the aspects of instantiating a container or virtual machine (VM) within VMware (hypervisor). Infrastructure controller may also manage spin up of additional instances dues to volume or failure and/or placement moves for efficiency and resiliency.

Infrastructure Controller

Version 1.0 Phase 1.0 Proposed

KS0567 created on 10/27/2015. Last modified 12/21/2016

Extends ControllerInstance (Management Software)

| **OUTGOING STRUCTURAL RELATIONSHIPS** |
| --- |
| Generalization from Infrastructure Controller to ControllerInstance (Management Software)  [ Direction is 'Source -> Destination'. ] |

| **INCOMING STRUCTURAL RELATIONSHIPS** |
| --- |
| Generalization from Container Engine 2 to Infrastructure Controller  [ Direction is 'Source -> Destination'. ] |

|  |
| --- |
| Generalization from ContainerEngine to Infrastructure Controller  [ Direction is 'Source -> Destination'. ] |

|  |
| --- |
| Generalization from Hypervisor to Infrastructure Controller  [ Direction is 'Source -> Destination'. ] |

## **InfrastructureServiceDesc**

*Class in package 'Resource'*

InfrastructureServiceDesc

Version 1.0 Phase 1.0 Proposed

KS0567 created on 10/23/2017. Last modified 10/23/2017

Extends ServiceComponentDesc (ServiceComponentCatalogItem)

| **OUTGOING STRUCTURAL RELATIONSHIPS** |
| --- |
| Generalization from InfrastructureServiceDesc to ServiceComponentDesc (ServiceComponentCatalogItem)  [ Direction is 'Source -> Destination'. ] |

## **LicenseKeyCatalogItem**

*Class in package 'Resource'*

LicenseKeyCatalogItem

Version 1.0 Phase 1.0 Proposed

KS0567 created on 11/2/2017. Last modified 11/2/2017

Extends ResourceCatalogItem

| **OUTGOING STRUCTURAL RELATIONSHIPS** |
| --- |
| Generalization from LicenseKeyCatalogItem to ResourceCatalogItem  [ Direction is 'Source -> Destination'. ] |

## **LicenseKeyFileCatlogItem**

*Class in package 'Resource'*

A license key is an identifier for the right to use arrangement between the customer (AT&T) and the supplier of the software product. License keys ***provide a proof of license*** and are associated with each instance of the software. *Key = unique series of numbers and/or letters*.

LicenseKeyFileCatlogItem

Version 1.0 Phase 1.0 Proposed

mm7817 created on 1/21/2016. Last modified 5/19/2017

| **ASSOCIATIONS** | |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) LicenseKeyFileCatlogItem | Target: Public (Class) CustomerSubscriptionInstance |

|  |  |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) LicenseKeyFileCatlogItem | Target: Public (Class) FeatureGroupItem |

|  |  |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) SoftwareLicense  Cardinality: [1] | Target: Public (Class) LicenseKeyFileCatlogItem  Cardinality: [1] |

## **LicenseKeyInstance**

*Class in package 'Resource'*

Keys may be universal or unique. Keys may be necessary when instantiating an instance of the vNF (e.g. vCE)

LicenseKeyInstance

Version 1.0 Phase 1.0 Proposed

MM7817 created on 8/31/2016. Last modified 8/23/2017

Extends ResourceInstance

| **OUTGOING STRUCTURAL RELATIONSHIPS** |
| --- |
| Generalization from LicenseKeyInstance to ResourceInstance  [ Direction is 'Source -> Destination'. ] |

| **ASSOCIATIONS** | |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) LicenseKeyInstance | Target: Public (Class) ResourceCatalogItem |

|  |  |
| --- | --- |
| Association (direction: Unspecified)  LicenseKeyInstanceProvidesProofOfAuthorizationFor | |
| Source: Public (Class) LicenseKeyInstance  Cardinality: [0..\*] | Target: Public (Class) ControllerInstance (Management Software)  Cardinality: [0..\*] |

|  |  |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) LicenseKeyInstance | Target: Public (Class) ResourceCapability |

|  |  |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) LicenseKeyInstance  Cardinality: [0..\*] | Target: Public (Class) SoftwareLicense  Cardinality: [1] |

|  |  |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) LicenseKeyInstance | Target: Public (Class) ResourceCapability |

|  |  |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) LicenseKeyInstance  Cardinality: [0..\*] | Target: Public (Class) Resource/Supplier partner License  Cardinality: [1..\*] |

|  |  |
| --- | --- |
| Association (direction: Unspecified)  LicenseKeyInstanceProvidesProofOfAuthorizationFor | |
| Source: Public (Class) LicenseKeyInstance  Cardinality: [0..\*] | Target: Public (Class) VNFInstance  Cardinality: [0..\*] |

## **LifeCycleManagementOperationDesc**

*Class in package 'Resource'*

Defines a lifecycle management operation and the list of events that stimulate it.

References:

ETSI GS NFV-IFA 011 V2.1.3 (LifeCycleManagementScript)

LifeCycleManagementOperationDesc

Version 1.0 Phase 1.0 Proposed

am803u created on 11/1/2017. Last modified 11/3/2017

| **ATTRIBUTES** |
| --- |
| events : String Public  Multiplicity: ( [1..\*], Allow duplicates: 0, Is ordered: False )  Describes lifecycle event(s) or an external stimulus that may trigger the operation.  References:  ETSI GS NFV-IFA 011 V2.1.3 (event)  [ Is static False. Containment is Not Specified. ] |

|  |
| --- |
| operation : String Public  The name of the LCM Operation  [ Is static False. Containment is Not Specified. ] |

|  |
| --- |
| script : String Public  Includes a LCM script (e.g. written in a DSL) triggered to react to one of the events listed in the events attribute.  References:  ETSI GS NFV-IFA 011 V2.1.3  [ Is static False. Containment is Not Specified. ] |

| **ASSOCIATIONS** | |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) VNFDesc (VNFCatalogItem) | Target: Public (Class) LifeCycleManagementOperationDesc  Cardinality: [0..\*] |

## **LogicalNodeDesc**

*Class in package 'Resource'*

This information element describes compute, memory and I/O requirements that are to be associated with the logical node of infrastructure. The logical node requirements are a sub-component of the VDU level requirements.

References:

ETSI GS NFV-IFA 011 V2.1.3

LogicalNodeDesc

Version 1.0 Phase 1.0 Proposed

am803u created on 10/30/2017. Last modified 11/3/2017

| **ATTRIBUTES** |
| --- |
| logicalNodeRequirements : NameValuePair Public  Multiplicity: ( [0..\*], Allow duplicates: 0, Is ordered: False )  The logical node-level compute, memory and I/O requirements. An array of key-value pairs that articulate the deployment requirements.  This could include the number of CPU cores on this logical node, a memory configuration specific to a logical node (e.g. such as available in the Linux kernel via the libnuma library) or a requirement related to the association of an I/O device with the logical node.  References:  ETSI GS NFV-IFA 011 V2.1.3  [ Is static False. Containment is Not Specified. ] |

| **ASSOCIATIONS** | |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) VirtualComputeDesc | Target: Public (Class) LogicalNodeDesc  Cardinality: [1..\*] |

## **MonitoringParameterDesc**

*Class in package 'Resource'*

This information element specifies the virtualised resource related performance metrics to be tracked

References:

tosca-nfv-YAML-v1.0-wd05-rev02

ETSI GS NFV-IFA 011 V2.1.3

MonitoringParameterDesc

Version 1.0 Phase 1.0 Proposed

KS0567 created on 10/19/2017. Last modified 11/3/2017

| **ATTRIBUTES** |
| --- |
| name : String Public  Multiplicity: ( [0..1], Allow duplicates: 0, Is ordered: False )  Human readable name of the monitoring parameter  References:  tosca-nfv-YAML-v1.0-wd05-rev02  ETSI GS NFV-IFA 011 V2.1.3  [ Is static False. Containment is Not Specified. ] |

|  |
| --- |
| performanceMetric : String Public  Identifies the virtualised resource performance metric  References:  tosca-nfv-YAML-v1.0-wd05-rev02  ETSI GS NFV-IFA 011 V2.1.3  [ Is static False. Containment is Not Specified. ] |

| **ASSOCIATIONS** | |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) MonitoringParameterDesc | Target: Public (Class) VNFDesc (VNFCatalogItem) |

|  |  |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) MonitoringParameterDesc  Cardinality: [0..\*] | Target: Public (Class) VNFVirtualLinkDesc (VLD) |

|  |  |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) VNFCDesc (VDU) (VNFCCatalogItem) | Target: Public (Class) MonitoringParameterDesc  Cardinality: [0..\*] |

## **NFDescription**

*Class in package 'Resource'*

NFDescription

Version 1.0 Phase 1.0 Proposed

KS0567 created on 7/12/2017. Last modified 7/12/2017

| **OUTGOING STRUCTURAL RELATIONSHIPS** |
| --- |
| Aggregation from NFDescription to PNFCatalogItem  [ Direction is 'Source -> Destination'. ] |

|  |
| --- |
| Aggregation from NFDescription to PNFnstance  [ Direction is 'Source -> Destination'. ] |

|  |
| --- |
| Aggregation from NFDescription to VNFInstance  [ Direction is 'Source -> Destination'. ] |

|  |
| --- |
| Aggregation from NFDescription to VNFDesc (VNFCatalogItem)  [ Direction is 'Source -> Destination'. ] |

| **ATTRIBUTES** |
| --- |
| NF-CODE : String Private  Short code that is used in VNF, PNF, and VM instance naming. The NF Code can be the same value or a different value than the NF Role. Naming convention examples:  NVP VF Naming Convention:<complex\_code><sequence\_number><**function\_code**>  US Name Example: abrva301vn2 ; MOW Name Example: GBLOND1001vn2  NVP VM Naming Convention: <loc-id>v<cluster-number><**function-code**><count>  VM Naming Example: abrvav0vn2b001.  **function code** = **NF Code**  Mobility VM Naming Convention: Z<cloud\_zone\_id><**VF\_name (vvvv)>** <VF\_instance\_number><vm\_identifier (PPP)><VM\_instance\_number>  **VVVV = NF code**  VUSP/Trinity VM Naming Convention:  <**function\_code(FC)**><VF\_instance\_number>V<vm\_id\_number><virtual\_component(VC)><vitrual\_componentid>  **FC = NF code**  [ Is static False. Containment is Not Specified. ] |

|  |
| --- |
| NF-FUNCTION : Sring Private  Provides an English description of Network function that the specific VNF or PNF deployment is providing. Assigned as part of the customization of a VNF in a service : SDN Gateway, Provider Edge Router, Cache  [ Is static False. Containment is Not Specified. ] |

|  |
| --- |
| NF-Role : String Private  Short code that defines a Network Device that the Vendor Software or PNF is providing;  Examples of Network\_Role: vCE, vARM, vBNG, vPE, vASE, vSeGW (resource models in ASDC).  **Note:** The same Vendor software (e.g. Brocade Vyatta 5600) can be used to create multiple VF Resource definitions. (See Spreadsheet examples); Allow entry of new value when a VNF/PNF Resource Model is being created however values must be agreed to by Service Teams and Ops; The same value used for different vendor products providing the same role.  [ Is static False. Containment is Not Specified. ] |

|  |
| --- |
| NF-TYPE : String Private  Generic description of the type of Network Device (VNF and PNFs)  Examples: Router Switch, Firewall, Application Server  [ Is static False. Containment is Not Specified. ] |

|  |
| --- |
| NFC-Naming\_Code : String Private  Short code that is used in VM instance (vserver) naming. The NFC Naming Code will be used in the following naming convention examples:  Mobility VM Naming Convention: Z<cloud\_zone\_id><VF\_name (vvvv)> <VF\_instance\_number><**vm\_identifier (PPP**)><VM\_instance\_number>  **PPP = NFC Naming code**  VUSP/Trinity VM Naming Convention:  <function\_code(FC)><VF\_instance\_number>V<vm\_id\_number><**virtual\_component(VC)**><vitrual\_componentid>  **VC = NFC Naming code**  [ Is static False. Containment is Not Specified. ] |

## **Network**

*Class in package 'Resource'*

Network

Version 1.0 Phase 1.0 Proposed

KS0567 created on 6/3/2016. Last modified 6/3/2016

| **INCOMING STRUCTURAL RELATIONSHIPS** |
| --- |
| Aggregation from ResourceInstance to Network  [ Direction is 'Source -> Destination'. ] |

|  |
| --- |
| Aggregation from ResourceInstance to Network  [ Direction is 'Source -> Destination'. ] |

## **Network Controller**

*Class in package 'Resource'*

Software Defined Network local and global controllers (SDN-C, SDN-G). Network controllers are used to establish L2 or L3 connectivity for a network VF such as a virtual Premise Edge router (vPE).

Network Controller

Version 1.0 Phase 1.0 Proposed

KS0567 created on 10/27/2015. Last modified 11/4/2016

Extends ControllerInstance (Management Software)

| **OUTGOING STRUCTURAL RELATIONSHIPS** |
| --- |
| Generalization from Network Controller to ControllerInstance (Management Software)  [ Direction is 'Source -> Destination'. ] |

## **NetworkFunction**

*Class in package 'Resource'*

A **NetworkFunction** is a type of Resource. It is a Functional Block (FB) within a network infrastructure that has well-defined external interfaces and well-defined functional behavior.

NetworkFunction

Version 1.0 Phase 1.0 Proposed

KS0567 created on 9/9/2016. Last modified 9/16/2016

Extends ResourceInstance

| **OUTGOING STRUCTURAL RELATIONSHIPS** |
| --- |
| Aggregation from NetworkFunction to ResourceInstance  [ Direction is 'Source -> Destination'. ] |

|  |
| --- |
| Aggregation from NetworkFunction to NetworkFunctionComposite  [ Name is HasNetworkFunctions. Direction is 'Source -> Destination'. ] |

|  |
| --- |
| Generalization from NetworkFunction to ResourceInstance  [ Direction is 'Source -> Destination'. ] |

| **INCOMING STRUCTURAL RELATIONSHIPS** |
| --- |
| Generalization from NetworkFunctionAtomic to NetworkFunction  [ Direction is 'Source -> Destination'. ] |

|  |
| --- |
| Generalization from NetworkFunctionComposite to NetworkFunction  [ Direction is 'Source -> Destination'. ] |

## **NetworkFunctionAtomic**

*Class in package 'Resource'*

A **NetworkFunctionAtomic** is a NetworkFunction that is not further decomposed into finer grained NetworkFunctions. It can therefore be used as a stand-alone entity.

NetworkFunctionAtomic

Version 1.0 Phase 1.0 Proposed

KS0567 created on 9/9/2016. Last modified 9/14/2016

Extends NetworkFunction

| **OUTGOING STRUCTURAL RELATIONSHIPS** |
| --- |
| Generalization from NetworkFunctionAtomic to NetworkFunction  [ Direction is 'Source -> Destination'. ] |

| **INCOMING STRUCTURAL RELATIONSHIPS** |
| --- |
| Generalization from VNFInstance to NetworkFunctionAtomic  [ Direction is 'Source -> Destination'. ] |

|  |
| --- |
| Generalization from PNFnstance to NetworkFunctionAtomic  [ Direction is 'Source -> Destination'. ] |

|  |
| --- |
| Generalization from VNFC Instance to NetworkFunctionAtomic  [ Direction is 'Source -> Destination'. ] |

| **ASSOCIATIONS** | |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) PNFnstance | Target: Public (Class) NetworkFunctionAtomic |

## **NetworkFunctionComposite**

*Class in package 'Resource'*

A **NetworkFunctionComposite** is a collection of Atomic and Composite NetworkFunctions.

NetworkFunctionComposite

Version 1.0 Phase 1.0 Proposed

KS0567 created on 9/9/2016. Last modified 9/14/2016

Extends NetworkFunction

| **OUTGOING STRUCTURAL RELATIONSHIPS** |
| --- |
| Generalization from NetworkFunctionComposite to NetworkFunction  [ Direction is 'Source -> Destination'. ] |

| **INCOMING STRUCTURAL RELATIONSHIPS** |
| --- |
| Aggregation from NetworkFunction to NetworkFunctionComposite  [ Name is HasNetworkFunctions. Direction is 'Source -> Destination'. ] |

## **PNFCatalogItem**

*Class in package 'Resource'*

PNFCatalogItem

Version 1.0 Phase 1.0 Proposed

KS0567 created on 6/19/2017. Last modified 6/22/2017

Extends ResourceCatalogItem

| **OUTGOING STRUCTURAL RELATIONSHIPS** |
| --- |
| Generalization from PNFCatalogItem to ResourceCatalogItem  [ Direction is 'Source -> Destination'. ] |

| **INCOMING STRUCTURAL RELATIONSHIPS** |
| --- |
| Aggregation from NFDescription to PNFCatalogItem  [ Direction is 'Source -> Destination'. ] |

| **ASSOCIATIONS** | |
| --- | --- |
| Association (direction: Unspecified)  PNFCatalogItemMadeAvailableAs | |
| Source: Public (Class) PNFCatalogItem  Cardinality: [1] | Target: Public (Class) PNFnstance  Cardinality: [0..\*] |

|  |  |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) PNF | Target: Public (Class) PNFCatalogItem |

## **PNFnstance**

*Class in package 'Resource'*

Traditional network access iron such as ALU7330 VRAD or 7342/7360 PON Optical Line terminal (OLT). May also represent a blade server running VM's capable of supporting vNF's such as vBNG (Border Network Gateway). A vBNG would replace traditional ALU7750 routing and switch aggregation within the Lightspeed overlay network.

May also represent:

- cabling (eg CU, fiber,...)

- software controlled switches/routers leaf/spine fabric (e.g. NCS 550x)

A **PNF** is an implementation of a NetworkFunction for which all the LogicalResources it is being provided are hosted directly by PhysicalResources.

PNFnstance

Version 1.0 Phase 1.0 Proposed

mm7817 created on 1/13/2016. Last modified 6/22/2017

Extends NetworkFunctionAtomic, ResourceInstance

| **OUTGOING STRUCTURAL RELATIONSHIPS** |
| --- |
| Generalization from PNFnstance to NetworkFunctionAtomic  [ Direction is 'Source -> Destination'. ] |

|  |
| --- |
| Generalization from PNFnstance to ResourceInstance  [ Direction is 'Source -> Destination'. ] |

|  |
| --- |
| Generalization from PNFnstance to ResourceInstance  [ Direction is 'Source -> Destination'. ] |

| **INCOMING STRUCTURAL RELATIONSHIPS** |
| --- |
| Generalization from PNF to PNFnstance  [ Direction is 'Source -> Destination'. ] |

|  |
| --- |
| Aggregation from NFDescription to PNFnstance  [ Direction is 'Source -> Destination'. ] |

|  |
| --- |
| Aggregation from LocalPlace to PNFnstance  [ Name is ResourceProvidesLocalPlaces. Direction is 'Source -> Destination'. ] |

| **ATTRIBUTES** |
| --- |
| manufactureDate : char Public  [ Is static False. Containment is Not Specified. ] |

|  |
| --- |
| otherIdentifier : char Public  [ Is static False. Containment is Not Specified. ] |

|  |
| --- |
| powerState : int Public  [ Is static False. Containment is Not Specified. ] |

|  |
| --- |
| serialNumber : char Public  [ Is static False. Containment is Not Specified. ] |

|  |
| --- |
| versionNumber : char Public  [ Is static False. Containment is Not Specified. ] |

| **ASSOCIATIONS** | |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) PNFnstance  Cardinality: [1..] | Target: Public (Class) Virtual Machine (Type 1 - vServer)  Cardinality: [0..\*] |

|  |  |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) PNFnstance | Target: Public (Class) NetworkFunctionAtomic |

|  |  |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) PNFnstance | Target: Public (Class) ControllerInstance (Management Software) |

|  |  |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) PNFnstance  Cardinality: [1..\*] | Target: Public (Class) Place  Cardinality: [1..\*] |

|  |  |
| --- | --- |
| Association (direction: Unspecified)  PNFCatalogItemMadeAvailableAs | |
| Source: Public (Class) PNFCatalogItem  Cardinality: [1] | Target: Public (Class) PNFnstance  Cardinality: [0..\*] |

|  |  |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) VM Virtual Machine  Cardinality: [1..\*] | Target: Public (Class) PNFnstance  Cardinality: [1] |

|  |  |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) Container Infrastructure  Cardinality: [1] | Target: Public (Class) PNFnstance  Cardinality: [1..\*] |

## **RequestedAdditionalCapability**

*Class in package 'Resource'*

Describes requested additional capability for a particular VDU. Such a capability may be for acceleration or specific tasks

References:

tosca-nfv-YAML-v1.0-wd05-rev02

ETSI GS NFV-IFA 011 V2.1.3 (RequestedAdditionalCapabilityData)

RequestedAdditionalCapability

Version 1.0 Phase 1.0 Proposed

am803u created on 11/2/2017. Last modified 11/2/2017

| **ATTRIBUTES** |
| --- |
| minRequestedAdditionalCapabilityVersion : String Public  Multiplicity: ( [0..1], Allow duplicates: 0, Is ordered: False )  Identifies the minimum version of the requested additional capability.  References:  tosca-nfv-YAML-v1.0-wd05-rev02 (min\_requested\_additional\_capability\_version)  ETSI GS NFV-IFA 011 V2.1.3  [ Is static False. Containment is Not Specified. ] |

|  |
| --- |
| preferredRequestedAdditionalCapabilityVersion : String Public  Multiplicity: ( [0..1], Allow duplicates: 0, Is ordered: False )  Identifies the preferred version of the requested additional capability  References:  tosca-nfv-YAML-v1.0-wd05-rev02 (preferred\_requested\_additinal\_capability\_version)  ETSI GS NFV-IFA 011 V2.1.3  [ Is static False. Containment is Not Specified. ] |

|  |
| --- |
| requestedAdditionalCapabilityName : String Public  Identifies a requested additional capability for the VDU.  References:  tosca-nfv-YAML-v1.0-wd05-rev02 (request\_additional\_capability\_name)  ETSI GS NFV-IFA 011 V2.1.3  [ Is static False. Containment is Not Specified. ] |

|  |
| --- |
| supportMandatory : boolean Public  Indicates whether the requested additional capability is mandatory for successful operation  References:  tosca-nfv-YAML-v1.0-wd05-rev02 (support\_mandatory)  ETSI GS NFV-IFA 011 V2.1.3  [ Is static False. Containment is Not Specified. ] |

|  |
| --- |
| targetPerformanceParameters : NameValuePair Public  Multiplicity: ( [1..\*], Allow duplicates: 0, Is ordered: False )  Identifies specific attributes, dependent on the requested additional capability type  References:  tosca-nfv-YAML-v1.0-wd05-rev02 (target\_performance\_parameters)  ETSI GS NFV-IFA 011 V2.1.3  [ Is static False. Containment is Not Specified. ] |

| **ASSOCIATIONS** | |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) VirtualComputeDesc | Target: Public (Class) RequestedAdditionalCapability  Cardinality: [0..\*] |

## **Resource Configuration**

*Class in package 'Resource'*

Resource Configuration

Version 1.0 Phase 1.0 Proposed

ks0567 created on 11/5/2015. Last modified 2/25/2016

## **ResourceCatalogItem**

*Class in package 'Resource'*

ResourceCatalogItems represent physical and non-physical (virtual) components which are owned / managed by the business or provided by a Supplier and are used to construct services.

ResourceCatalogItems may be, for example: human resources (skills and expertise), devices and accessories, components drawn from the Application, Computing and Network domains (network elements, software, computing resources), or information (data).

Multiple Suppliers may provide the same resource. Depending on availability and cost, a Service may be fulfilled using the Resources from one Supplier or another when ordered by a customer.

SID calls a "ResourceCatalogItem" a "ResourceSpecification"

A ResourceCatalogItem is an entity that enables the ResourceSpecifications to a catalog. A ResourceCandidate and its ResourceSpecification may be “published” - made visible - in any number of ResourceCatalogs, or in none.

ResourceCatalogItem

Version 1.0 Phase 1.0 Proposed

KS0567 created on 10/27/2015. Last modified 9/18/2017

Extends CatalogItem

| **OUTGOING STRUCTURAL RELATIONSHIPS** |
| --- |
| Aggregation from ResourceCatalogItem to ResourceCatalog  [ Direction is 'Source -> Destination'. ] |

|  |
| --- |
| Aggregation from ResourceCatalogItem to ServiceComponentDesc (ServiceComponentCatalogItem)  [ Name is ServiceComponentMadeUpOf. Direction is 'Source -> Destination'. ] |

|  |
| --- |
| Generalization from ResourceCatalogItem to CatalogItem  [ Direction is 'Source -> Destination'. ] |

|  |
| --- |
| Aggregation from ResourceCatalogItem to DirectedGraph  [ Direction is 'Source -> Destination'. ] |

|  |
| --- |
| Generalization from ResourceCatalogItem to CatalogItem  [ Direction is 'Source -> Destination'. ] |

|  |
| --- |
| Aggregation from ResourceCatalogItem to ResourceCatalogItem  [ Name is ResourceCatalogItemReferences. Direction is 'Source -> Destination'. ] |

| **INCOMING STRUCTURAL RELATIONSHIPS** |
| --- |
| Aggregation from ResourceCatalogItemVersion to ResourceCatalogItem  [ Name is ResourceCatalogItemModificationsRecordedAs. Direction is 'Source -> Destination'. ] |

|  |
| --- |
| Generalization from VNFDesc (VNFCatalogItem) to ResourceCatalogItem  [ Direction is 'Source -> Destination'. ] |

|  |
| --- |
| Aggregation from ResourceCatalogItemType to ResourceCatalogItem  [ Direction is 'Source -> Destination'. ] |

|  |
| --- |
| Aggregation from ResourceItemCharacteristic to ResourceCatalogItem  [ Name is ResourceCatalogItemDescribedBy. Direction is 'Source -> Destination'. ] |

|  |
| --- |
| Generalization from EntitilementCatalogItem to ResourceCatalogItem  [ Direction is 'Source -> Destination'. ] |

|  |
| --- |
| Generalization from PNFCatalogItem to ResourceCatalogItem  [ Direction is 'Source -> Destination'. ] |

|  |
| --- |
| Aggregation from CharacteristicSpecification to ResourceCatalogItem  [ Name is ResourceCatalogItemDescribedBy. Direction is 'Source -> Destination'. ] |

|  |
| --- |
| Aggregation from ResourceCatalogItem to ResourceCatalogItem  [ Name is ResourceCatalogItemReferences. Direction is 'Source -> Destination'. ] |

|  |
| --- |
| Generalization from LicenseKeyCatalogItem to ResourceCatalogItem  [ Direction is 'Source -> Destination'. ] |

| **ATTRIBUTES** |
| --- |
| AT&TContact : char Private  This is the technology owner. ATT UID. Future click on UID and launch mail client. Multiple contacts should be supported.  [ Is static False. Containment is Not Specified. ] |

|  |
| --- |
| Capacity : Document Private  Obtain from vendor if available; tester can add additional information  [ Is static False. Containment is Not Specified. ] |

|  |
| --- |
| Catagory : DropDown Private  Designer cannot define new Category. Process required to add/change/delete  [ Is static False. Containment is Not Specified. ] |

|  |
| --- |
| Constraints : char Private  From the TOSCA model. Multiple fields. Could include thresholds and policies. Vendor upgrade requirements should also be included here.  [ Is static False. Containment is Not Specified. ] |

|  |
| --- |
| Cost : char Private  2015: will be blank and not mandatory. 2016 may be accessed by role (TBD) and will be a mandatory field.  [ Is static False. Containment is Not Specified. ] |

|  |
| --- |
| D2RequirementsChecklist : Document Private  Spreadsheet with input constraints, entries will be searchable  [ Is static False. Containment is Not Specified. ] |

|  |
| --- |
| EntitlementID : char Private  Composite ID of contract and entitlement number from myprocurement  [ Is static False. Containment is Not Specified. ] |

|  |
| --- |
| EntitlementUnitType : char Private  From contract/entitlement  [ Is static False. Containment is Not Specified. ] |

|  |
| --- |
| EntitlemnetUnitNumber : char Private  From contract/entitlement  [ Is static False. Containment is Not Specified. ] |

|  |
| --- |
| FaultRequirements : Document Private  Obtain from vendor  [ Is static False. Containment is Not Specified. ] |

|  |
| --- |
| Features : Document Private  Obtain from vendor  [ Is static False. Containment is Not Specified. ] |

|  |
| --- |
| History : char Private  Keeping all major events, i.e., author, creation date, any modification, check in and check out with ATT UID  [ Is static False. Containment is Not Specified. ] |

|  |
| --- |
| Icon : Image Private  [ Is static False. Containment is Not Specified. ] |

|  |
| --- |
| LicensingModel : DropDown Private  Multiple fields. Categories of licenses planned; type, unit.  [ Is static False. Containment is Not Specified. ] |

|  |
| --- |
| Performance : Document Private  Obtain from vendor if available; tester can add additional information  [ Is static False. Containment is Not Specified. ] |

|  |
| --- |
| Requirements : Private  Multiple fields. Includes connectivity  [ Is static False. Containment is Not Specified. ] |

|  |
| --- |
| Resource Type : char Private  [ Is static False. Containment is Not Specified. ] |

|  |
| --- |
| ResourceDescription : char Private  Visible when the user hovers over this resource in the design studio UI.  [ Is static False. Containment is Not Specified. ] |

|  |
| --- |
| ResourceDisplayName : char Private  Human readable resource name. The display name is used in the ASDC catalog and the workspaces for each role.  - Max length of 25 characters  - Allowed characters: alphanumeric, space, underscore, dash, dot.  - Defined by the designer during the resource onboarding process (create/import).  - Can be modified until the Resource is submitted for testing. Display name is not editable once the resource is in release 1.0.  - Name must be unique and is searchable.  [ Is static False. Containment is Not Specified. ] |

|  |
| --- |
| ResourceSystemName : int Private  This field will be used in URLs and not exposed in create/import resource UI; will be displayed in design studio.  Meaningful resource name used in API. The system name is used in the distribution studio (distribution notification and distribution API).  - Max length of 25 characters  - Allowed characters: alphanumeric, underscore, dash, dot.  - Autocreated based upon the Resource Display Name: spaces are trimmed, each word starts with a capital letter, on the first letter of abbreviation and acronyms are capitalized.  - If the Resource Display name changes, the Resource System name will automatically be updated.  - Resource System name is not editable by the designer.  - Name must be unique and is searchable.  [ Is static False. Containment is Not Specified. ] |

|  |
| --- |
| ResourceUUID : String Private  This is a cross-ECOMP resource version identifier. UUID generated by algorithm. Will be different for every x.1 version of the resource It is not editable and cannot be changed.  [ Is static False. Containment is Not Specified. ] |

|  |
| --- |
| Status : char Private  3 roles in 1507 (user, tester, admin). Operations = user, Governance = admin. 5 roles are supported in 1510. Designers = 'users'; testers = 'testers'; operations = 'operations'; governance = 'governance'; admin = 'admin'. 2016 may expand number of roles. Whatever state you're in, whoever is responsible for incrementing state could also decrement state.  [ Is static False. Containment is Not Specified. ] |

|  |
| --- |
| Subcategory : DropDown Private  Flat list in 1507. In 1510, UI will be separated to different field from Category.  [ Is static False. Containment is Not Specified. ] |

|  |
| --- |
| Tags/Keywords : char Private  Must accept multiple keywords.  [ Is static False. Containment is Not Specified. ] |

|  |
| --- |
| Template : DropDown Private  Need to define a list of templates. Tied to Category. Designer cannot create new template (must be created by development team). Process required to add/change/delete. Could consider designer ability to create / modify template in 1602.  [ Is static False. Containment is Not Specified. ] |

|  |
| --- |
| TestScripts : Document Private  [ Is static False. Containment is Not Specified. ] |

|  |
| --- |
| Vendor : char Private  Admin and tester can make changes beyond State 3. 1510: should not be free text - should be searched and obtained from myprocurement.  [ Is static False. Containment is Not Specified. ] |

|  |
| --- |
| VendorRelease : char Private  Admin and tester can make changes beyond State 3.  [ Is static False. Containment is Not Specified. ] |

|  |
| --- |
| VendorTestResults : Document Private  Access may be restricted in future  [ Is static False. Containment is Not Specified. ] |

|  |
| --- |
| Version : char Private  [ Is static False. Containment is Not Specified. ] |

|  |
| --- |
| VF-SpecificPolicies : File Private  Part of the lifecycle management of the artifact.  [ Is static False. Containment is Not Specified. ] |

|  |
| --- |
| VFArtifacts : char Private  Artifact name stored in Swift. Artifacts are searchable / indexable.  [ Is static False. Containment is Not Specified. ] |

|  |
| --- |
| VFConfigParameters : File Private  Scripts are an artifact, this may be redundant  [ Is static False. Containment is Not Specified. ] |

|  |
| --- |
| VFImage : char Private  URL to file stored in Glance or Swift, depending upon image vs. binary  [ Is static False. Containment is Not Specified. ] |

| **ASSOCIATIONS** | |
| --- | --- |
| Association (direction: Unspecified)  ResourceCatalogItemMadeAvailableAs | |
| Source: Public (Class) ResourceCatalogItem  Cardinality: [1] | Target: Public (Class) ResourceInstance  Cardinality: [0..\*] |

|  |  |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) ResourceCatalogItem  Cardinality: [1..] | Target: Public (Class) ResourceOrder  Cardinality: [0..\*] |

|  |  |
| --- | --- |
| Association (direction: Unspecified)  ProjectDeliverableEnablesResourceCatalogItem | |
| Source: Public (Class) ResourceCatalogItem  Cardinality: [0..1] | Target: Public (Class) ProjectDeliverable  Cardinality: [0..\*] |

|  |  |
| --- | --- |
| Association (direction: Unspecified)  ResourceConfigSpecDefinedFor | |
| Source: Public (Class) ResourceCatalogItem  Cardinality: [1] | Target: Public (Class) ResourceConfigSpec  Cardinality: [0..\*] |

|  |  |
| --- | --- |
| Association (direction: Unspecified)  ResourceCatalogItemContains | |
| Source: Public (Class) ResourceCatalogItem  Cardinality: [1..] | Target: Public (Class) FeatureGroupItem  Cardinality: [0..\*] |

|  |  |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) LicenseKeyInstance | Target: Public (Class) ResourceCatalogItem |

|  |  |
| --- | --- |
| Association (direction: Unspecified)  ResourceSpecificationMadeAvailableAs | |
| Source: Public (Class) ResourceSpecification  Cardinality: [1] | Target: Public (Class) ResourceCatalogItem  Cardinality: [0..1] |

|  |  |
| --- | --- |
| Association (direction: Unspecified)  ResourceCompositionProvidesComponentsFor | |
| Source: Public (Class) ResourceComposition | Target: Public (Class) ResourceCatalogItem |

|  |  |
| --- | --- |
| Association (direction: Unspecified)  ServiceCompositionProvides | |
| Source: Public (Class) ServiceComposition | Target: Public (Class) ResourceCatalogItem |

|  |  |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) ResourceSLO | Target: Public (Class) ResourceCatalogItem |

|  |  |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) VNFDesc (VNFCatalogItem) | Target: Public (Class) ResourceCatalogItem |

|  |  |
| --- | --- |
| Association (direction: Unspecified)  ResourceHas | |
| Source: Public (Class) ResourceCapability  Cardinality: [1..\*] | Target: Public (Class) ResourceCatalogItem  Cardinality: [0..1] |

|  |  |
| --- | --- |
| Association (direction: Unspecified)  ServiceCompositionProvides | |
| Source: Public (Class) ServiceComposition | Target: Public (Class) ResourceCatalogItem |

## **ResourceCatalogItemCharUse**

*Class in package 'Resource'*

ResourceCatalogItemCharUse

Version 1.0 Phase 1.0 Proposed

KS0567 created on 11/15/2016. Last modified 11/15/2016

## **ResourceCatalogItemCharUse**

*AssociationClass in package 'Resource'*

SpecCharUse is the 'hook' into the Characteristic Pattern. It can also include 'overrides' to the given CharacteristicSpecification for the given Specification.

ResourceCatalogItemCharUse

Version 1.0 Phase 1.0 Proposed

KS0567 created on 3/8/2016. Last modified 11/15/2016

| **ATTRIBUTES** |
| --- |
| canBeOveridden : boolean Private  [ Is static False. Containment is Not Specified. ] |

|  |
| --- |
| description : char Private  [ Is static False. Containment is Not Specified. ] |

|  |
| --- |
| extensible : boolean Private  [ Is static False. Containment is Not Specified. ] |

|  |
| --- |
| isPackage : boolean Private  [ Is static False. Containment is Not Specified. ] |

|  |
| --- |
| maxCardinality : int Private  [ Is static False. Containment is Not Specified. ] |

|  |
| --- |
| minCardinality : int Private  [ Is static False. Containment is Not Specified. ] |

|  |
| --- |
| name : char Private  [ Is static False. Containment is Not Specified. ] |

|  |
| --- |
| unique : char Private  [ Is static False. Containment is Not Specified. ] |

|  |
| --- |
| validFor : char Private  [ Is static False. Containment is Not Specified. ] |

| **ASSOCIATIONS** | |
| --- | --- |
| Association (direction: Unspecified)  PartyRoleSpecificationFurtherDefinedBy | |
| Source: Public (AssociationClass) ResourceCatalogItemCharUse  Cardinality: [\*] | Target: Public (Class) PartyRoleSpecification  Cardinality: [0..1] |

|  |  |
| --- | --- |
| Association (direction: Unspecified)  ResourceCatalogItemFurtherDefinedBy | |
| Source: Public (AssociationClass) ResourceCatalogItemCharUse | Target: Public (Class) ResourceCatalogItem  Cardinality: [0..\*] |

|  |  |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (AssociationClass) ResourceCatalogItemCharUse | Target: Public (Class) CatalogSpecification |

|  |  |
| --- | --- |
| Association (direction: Unspecified)  EntitySpecCharUseEnumeratedBy | |
| Source: Public (Class) EntitySpecCharValueUse  Cardinality: [\*] | Target: Public (AssociationClass) ResourceCatalogItemCharUse  Cardinality: [1] |

|  |  |
| --- | --- |
| AssociationClass (direction: Unspecified)  ResourceCatalogItemCharUseDescribedBy | |
| Source: Public (Class) CharacteristicSpecValue  Cardinality: [0..\*] | Target: Public (AssociationClass) ResourceCatalogItemCharUse  Cardinality: [0..\*] |

## **ResourceCatalogItemCharacteristicRelationship**

*AssociationClass in package 'Resource'*

ResourceCatalogItemCharacteristicRelationship is used to group or bundle Characteristics together. This entity can also be used to specify other relationships between characteristics, such as mutually exclusive, inclusive, etc.

ResourceCatalogItemCharacteristicRelationship

Version 1.0 Phase 1.0 Proposed

KS0567 created on 11/24/2015. Last modified 11/29/2016

## **ResourceCatalogItemCharacteristicUse**

*AssociationClass in package 'Resource'*

ResourceCatalogItemCharacteristicUse

Version 1.0 Phase 1.0 Proposed

KS0567 created on 11/24/2015. Last modified 11/29/2016

| **ASSOCIATIONS** | |
| --- | --- |
| Association (direction: Unspecified)  ResorceCatalogItemCharUseDescribedBy | |
| Source: Public (Class) ResourceCatalogItemCharacteristicValue  Cardinality: [\*] | Target: Public (AssociationClass) ResourceCatalogItemCharacteristicUse  Cardinality: [\*] |

## **ResourceCatalogItemCharacteristicValue**

*Class in package 'Resource'*

A ResourceCharacteristicValue defines a set of attributes, each of which can be assigned to a corresonding ResourceInstanceCharacteristicValue.

ResourceCatalogItemCharacteristicValue

Version 1.0 Phase 1.0 Proposed

KS0567 created on 11/17/2015. Last modified 11/29/2016

| **OUTGOING STRUCTURAL RELATIONSHIPS** |
| --- |
| Aggregation from ResourceCatalogItemCharacteristicValue to ResourceItemCharacteristic  [ Name is ResourceCatalotItemCharacteristicEnumeratedBy. Direction is 'Source -> Destination'. ] |

| **INCOMING STRUCTURAL RELATIONSHIPS** |
| --- |
| Aggregation from ResourceInstanceCharacteristicValue to ResourceCatalogItemCharacteristicValue  [ Name is ResourceSpecCharacteristicValueInstantiatedAs. Direction is 'Source -> Destination'. ] |

|  |
| --- |
| Generalization from vmme\_vlc to ResourceCatalogItemCharacteristicValue  [ Direction is 'Source -> Destination'. ] |

| **ASSOCIATIONS** | |
| --- | --- |
| Association (direction: Unspecified)  ResorceCatalogItemCharUseDescribedBy | |
| Source: Public (Class) ResourceCatalogItemCharacteristicValue  Cardinality: [\*] | Target: Public (AssociationClass) ResourceCatalogItemCharacteristicUse  Cardinality: [\*] |

|  |  |
| --- | --- |
| AssociationClass (direction: Unspecified)  ResourceCatalogItemCharacteristicValueReferences | |
| Source: Public (Class) ResourceCatalogItemCharacteristicValue  Cardinality: [0..\*] | Target: Public (Class) ResourceCatalogItemCharacteristicValue  Cardinality: [0..\*] |

|  |  |
| --- | --- |
| Association (direction: Unspecified)  ProductCatalogItemCharacteristicValueTranslatesTo ResourceCatlogItemCharacteristicValue | |
| Source: Public (Class) ProducCatalogItemCharacteristicValue  Cardinality: [0..\*] | Target: Public (Class) ResourceCatalogItemCharacteristicValue  Cardinality: [0..\*] |

|  |  |
| --- | --- |
| AssociationClass (direction: Unspecified)  ResourceCatalogItemCharacteristicValueReferences | |
| Source: Public (Class) ResourceCatalogItemCharacteristicValue  Cardinality: [0..\*] | Target: Public (Class) ResourceCatalogItemCharacteristicValue  Cardinality: [0..\*] |

|  |  |
| --- | --- |
| Association (direction: Unspecified)  ServiceCatalogItemCharacteristicValueTranslatesTo ResourceCatalogCharacteristicValue | |
| Source: Public (Class) ServiceCatalogItemCharacteristicValue  Cardinality: [0..\*] | Target: Public (Class) ResourceCatalogItemCharacteristicValue  Cardinality: [0..\*] |

|  |  |
| --- | --- |
| Association (direction: Unspecified)  ServiceCatalogItemCharacteristicValueTranslatesTo ResourceCatalogCharacteristicValue | |
| Source: Public (Class) ServiceCatalogItemCharacteristicValue  Cardinality: [0..\*] | Target: Public (Class) ResourceCatalogItemCharacteristicValue  Cardinality: [0..\*] |

## **ResourceCatalogItemCharacteristicValueRelationship**

*AssociationClass in package 'Resource'*

ResourceCatalogItemCharacteristicValueRelationship (and the CharacteristicValueRelationship pattern in general) is used to relate/manage dependencies between the values of two ResourceItemCharacteristicValuess. An example could be if one characteristic's value is blue, another characteristic's value must be black. This is done using the ProductCatalogItemCharacteristicValueRelationship with charValueRelationshipType set to 'inclusive'.

ResourceCatalogItemCharacteristicValueRelationship

Version 1.0 Phase 1.0 Proposed

KS0567 created on 11/24/2015. Last modified 11/29/2016

## **ResourceCatalogItemType**

*Class in package 'Resource'*

ResourceCatalogItemType

Version 1.0 Phase 1.0 Proposed

KS0567 created on 11/17/2015. Last modified 2/25/2016

| **OUTGOING STRUCTURAL RELATIONSHIPS** |
| --- |
| Aggregation from ResourceCatalogItemType to ResourceCatalogItem  [ Direction is 'Source -> Destination'. ] |

|  |
| --- |
| Aggregation from ResourceCatalogItemType to ResourceCatalogItem  [ Direction is 'Source -> Destination'. ] |

## **ResourceCatalogItemVersion**

*Class in package 'Resource'*

ResourceCatalogItemVersion

Version 1.0 Phase 1.0 Proposed

KS0567 created on 11/17/2015. Last modified 11/29/2016

| **OUTGOING STRUCTURAL RELATIONSHIPS** |
| --- |
| Aggregation from ResourceCatalogItemVersion to ResourceCatalogItem  [ Name is ResourceCatalogItemModificationsRecordedAs. Direction is 'Source -> Destination'. ] |

| **ASSOCIATIONS** | |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) ResourceCatalogItemVersion | Target: Public (Class) VnfDf |

## **ResourceComposition**

*Class in package 'Resource'*

ResourceComposition

Version 1.0 Phase 1.0 Proposed

ks0567 created on 10/28/2015. Last modified 7/29/2016

| **ASSOCIATIONS** | |
| --- | --- |
| Association (direction: Unspecified)  ResourceCompositionProvidesComponentsFor | |
| Source: Public (Class) ResourceComposition | Target: Public (Class) ResourceCatalogItem |

|  |  |
| --- | --- |
| Association (direction: Unspecified)  ResourceCompositionProvidesComponentsFor | |
| Source: Public (Class) ResourceComposition | Target: Public (Class) ResourceCatalogItem |

|  |  |
| --- | --- |
| Association (direction: Unspecified)  ResourceRecipeProvidesInstructionsFor | |
| Source: Public (Class) ResourceRecipe | Target: Public (Class) ResourceComposition |

## **ResourceInstance**

*Class in package 'Resource'*

A **ResourceInstance** is the instantiation of a given ASDC ServiceCatalog tem. A resource could be a controller, a virtual function, a virtual machine, or a physical resource.

A Resource Instance can consist of zero or more Resource Instances. A Resource Instance can also be prebuilt, meaning it does not have to be associated to a Service Instance. It can also be a shared resource, meaning it can be associated to more than one Service Instances.

The TMF SID calls a "Resource Instance" a "Resource"

ResourceInstance

Version 1.0 Phase 1.0 Proposed

KS0567 created on 10/26/2015. Last modified 10/31/2017

Extends InstanceItem

| **OUTGOING STRUCTURAL RELATIONSHIPS** |
| --- |
| Aggregation from ResourceInstance to Tenant (delete) - use Party based tenant  [ Direction is 'Source -> Destination'. ] |

|  |
| --- |
| Aggregation from ResourceInstance to ServiceComponentInstance  [ Direction is 'Source -> Destination'. ] |

|  |
| --- |
| Generalization from ResourceInstance to InstanceItem  [ Direction is 'Source -> Destination'. ] |

|  |
| --- |
| Generalization from ResourceInstance to InstanceItem  [ Direction is 'Source -> Destination'. ] |

|  |
| --- |
| Aggregation from ResourceInstance to ResourceFacingServiceInstance  [ Direction is 'Source -> Destination'. ] |

|  |
| --- |
| Aggregation from ResourceInstance to DirectedGraphInstance  [ Name is ServiceInstanceRealizedAs. Direction is 'Source -> Destination'. ] |

|  |
| --- |
| Aggregation from ResourceInstance to Network  [ Direction is 'Source -> Destination'. ] |

|  |
| --- |
| Aggregation from ResourceInstance to ServiceInstance  [ Name is ServiceInstanceRealizedAs. Direction is 'Source -> Destination'. ] |

| **INCOMING STRUCTURAL RELATIONSHIPS** |
| --- |
| Generalization from VNFInstance to ResourceInstance  [ Direction is 'Source -> Destination'. ] |

|  |
| --- |
| Aggregation from ResourceInstanceCharacteristicSet to ResourceInstance  [ Direction is 'Source -> Destination'. ] |

|  |
| --- |
| Generalization from LicenseKeyInstance to ResourceInstance  [ Direction is 'Source -> Destination'. ] |

|  |
| --- |
| Generalization from vHNPortal - Primary. to ResourceInstance  [ Direction is 'Source -> Destination'. ] |

|  |
| --- |
| Generalization from ControllerInstance (Management Software) to ResourceInstance  [ Direction is 'Source -> Destination'. ] |

|  |
| --- |
| Generalization from EntitlementInstance to ResourceInstance  [ Direction is 'Source -> Destination'. ] |

|  |
| --- |
| Aggregation from ResourceInstanceCharacteristicValue to ResourceInstance  [ Name is ResourceInstanceCharacteristivValue DefinesTheConfigurationOf. Direction is 'Source -> Destination'. ] |

|  |
| --- |
| Generalization from PNFnstance to ResourceInstance  [ Direction is 'Source -> Destination'. ] |

|  |
| --- |
| Aggregation from NetworkFunction to ResourceInstance  [ Direction is 'Source -> Destination'. ] |

|  |
| --- |
| Generalization from NetworkFunction to ResourceInstance  [ Direction is 'Source -> Destination'. ] |

| **ASSOCIATIONS** | |
| --- | --- |
| Association (direction: Unspecified)  ResourceCOnfigurationDefinedFor | |
| Source: Public (Class) ResourceInstance  Cardinality: [1] | Target: Public (Class) ResourceInstanceConfiguration  Cardinality: [0..\*] |

|  |  |
| --- | --- |
| Association (direction: Unspecified)  ResourceInstancesReferences | |
| Source: Public (Class) ResourceInstance  Cardinality: [0..\*] | Target: Public (Class) ResourceInstance  Cardinality: [0..\*] |

|  |  |
| --- | --- |
| Association (direction: Unspecified)  ResourceCatalogItemMadeAvailableAs | |
| Source: Public (Class) ResourceCatalogItem  Cardinality: [1] | Target: Public (Class) ResourceInstance  Cardinality: [0..\*] |

|  |  |
| --- | --- |
| Association (direction: Unspecified)  Controller Manages | |
| Source: Public (Class) ControllerInstance (Management Software)  Cardinality: [1] | Target: Public (Class) ResourceInstance  Cardinality: [0..\*] |

|  |  |
| --- | --- |
| Association (direction: Unspecified)  ResourceInstancesReferences | |
| Source: Public (Class) ResourceInstance  Cardinality: [0..\*] | Target: Public (Class) ResourceInstance  Cardinality: [0..\*] |

|  |  |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) CharacteristicValue | Target: Public (Class) ResourceInstance |

|  |  |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) CustomerServiceAccount | Target: Public (Class) ResourceInstance |

|  |  |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) Network  Cardinality: [1] | Target: Public (Class) ResourceInstance  Cardinality: [1..\*] |

|  |  |
| --- | --- |
| Association (direction: Unspecified)  ResourceInstanceEnumberatedBy | |
| Source: Public (Class) ResourceItemCharacteristic  Cardinality: [0..\*] | Target: Public (Class) ResourceInstance  Cardinality: [0..\*] |

|  |  |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) Network  Cardinality: [1] | Target: Public (Class) ResourceInstance  Cardinality: [1..\*] |

|  |  |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) ResourceSLO | Target: Public (Class) ResourceInstance |

|  |  |
| --- | --- |
| Association (direction: Unspecified)  ResourceOrderDelivers | |
| Source: Public (Class) ResourceOrder  Cardinality: [1] | Target: Public (Class) ResourceInstance  Cardinality: [1] |

|  |  |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) Network  Cardinality: [1] | Target: Public (Class) ResourceInstance  Cardinality: [1..\*] |

## **ResourceInstanceCharacteristicSet**

*Class in package 'Resource'*

ResourceInstanceCharacteristicSet

Version 1.0 Phase 1.0 Proposed

mm7817 created on 2/12/2016. Last modified 2/25/2016

| **OUTGOING STRUCTURAL RELATIONSHIPS** |
| --- |
| Aggregation from ResourceInstanceCharacteristicSet to ResourceInstance  [ Direction is 'Source -> Destination'. ] |

|  |
| --- |
| Aggregation from ResourceInstanceCharacteristicSet to ResourceInstance  [ Direction is 'Source -> Destination'. ] |

## **ResourceInstanceCharacteristicValue**

*Class in package 'Resource'*

ResourceInstanceCharacteristicValue

Version 1.0 Phase 1.0 Proposed

KS0567 created on 11/17/2015. Last modified 11/29/2016

| **OUTGOING STRUCTURAL RELATIONSHIPS** |
| --- |
| Aggregation from ResourceInstanceCharacteristicValue to ResourceCatalogItemCharacteristicValue  [ Name is ResourceSpecCharacteristicValueInstantiatedAs. Direction is 'Source -> Destination'. ] |

|  |
| --- |
| Aggregation from ResourceInstanceCharacteristicValue to ResourceInstance  [ Name is ResourceInstanceCharacteristivValue DefinesTheConfigurationOf. Direction is 'Source -> Destination'. ] |

|  |
| --- |
| Aggregation from ResourceInstanceCharacteristicValue to ResourceInstance  [ Name is ResourceInstanceCharacteristivValue DefinesTheConfigurationOf. Direction is 'Source -> Destination'. ] |

| **ASSOCIATIONS** | |
| --- | --- |
| Association (direction: Unspecified)  ResourceInstanceCharacteristicValueReferences | |
| Source: Public (Class) ResourceInstanceCharacteristicValue  Cardinality: [0..1] | Target: Public (Class) ResourceInstanceCharacteristicValue  Cardinality: [0..\*] |

|  |  |
| --- | --- |
| Association (direction: Unspecified)  ResourceInstanceCharacteristicValueReferences | |
| Source: Public (Class) ResourceInstanceCharacteristicValue  Cardinality: [0..1] | Target: Public (Class) ResourceInstanceCharacteristicValue  Cardinality: [0..\*] |

## **ResourceItemCharacteristic**

*Class in package 'Resource'*

A ResourceItemCharacteristic defines the characteristic features of a ResourceCatalotItem. Every ResourceCatalogItem has a variety of important attributes, methods, constraints, and relationships which distinguish that ResourceCatalogItem from other ResourceCatalogItems.

ResourceItemCharacteristic

Version 1.0 Phase 1.0 Proposed

KS0567 created on 11/17/2015. Last modified 11/29/2016

| **OUTGOING STRUCTURAL RELATIONSHIPS** |
| --- |
| Aggregation from ResourceItemCharacteristic to ResourceCatalogItem  [ Name is ResourceCatalogItemDescribedBy. Direction is 'Source -> Destination'. ] |

|  |
| --- |
| Aggregation from ResourceItemCharacteristic to ResourceCatalogItem  [ Name is ResourceCatalogItemDescribedBy. Direction is 'Source -> Destination'. ] |

| **INCOMING STRUCTURAL RELATIONSHIPS** |
| --- |
| Aggregation from ResourceCatalogItemCharacteristicValue to ResourceItemCharacteristic  [ Name is ResourceCatalotItemCharacteristicEnumeratedBy. Direction is 'Source -> Destination'. ] |

|  |
| --- |
| Generalization from ResourceItemCharacteristic\_child to ResourceItemCharacteristic  [ Direction is 'Source -> Destination'. ] |

| **ASSOCIATIONS** | |
| --- | --- |
| Association (direction: Unspecified)  ResourceInstanceEnumberatedBy | |
| Source: Public (Class) ResourceItemCharacteristic  Cardinality: [0..\*] | Target: Public (Class) ResourceInstance  Cardinality: [0..\*] |

|  |  |
| --- | --- |
| AssociationClass (direction: Unspecified)  ServiceCatalogItemCharacteristicReferences | |
| Source: Public (Class) ResourceItemCharacteristic  Cardinality: [0..\*] | Target: Public (Class) ResourceItemCharacteristic  Cardinality: [0..\*] |

|  |  |
| --- | --- |
| Association (direction: Unspecified)  ResourceInstanceEnumberatedBy | |
| Source: Public (Class) ResourceItemCharacteristic  Cardinality: [0..\*] | Target: Public (Class) ResourceInstance  Cardinality: [0..\*] |

|  |  |
| --- | --- |
| Association (direction: Unspecified)  ProductCatalogItemCharacteristicTranslatesto ResourceCatalogItemCharacteristic | |
| Source: Public (Class) ProductItemCharacteristic | Target: Public (Class) ResourceItemCharacteristic |

|  |  |
| --- | --- |
| AssociationClass (direction: Unspecified)  ServiceCatalogItemCharacteristicReferences | |
| Source: Public (Class) ResourceItemCharacteristic  Cardinality: [0..\*] | Target: Public (Class) ResourceItemCharacteristic  Cardinality: [0..\*] |

|  |  |
| --- | --- |
| Association (direction: Unspecified)  ServiceCatalogItemCharacteristicTranslatesToResourceCatalogItemCharacteristic | |
| Source: Public (Class) ServiceItemCharacteristic  Cardinality: [0..\*] | Target: Public (Class) ResourceItemCharacteristic  Cardinality: [0..\*] |

|  |  |
| --- | --- |
| Association (direction: Unspecified)  ServiceCatalogItemCharacteristicTranslatesToResourceCatalogItemCharacteristic | |
| Source: Public (Class) ServiceItemCharacteristic  Cardinality: [0..\*] | Target: Public (Class) ResourceItemCharacteristic  Cardinality: [0..\*] |

## **ResourceRecipe**

*Class in package 'Resource'*

ResourceRecipe

Version 1.0 Phase 1.0 Proposed

ks0567 created on 10/28/2015. Last modified 7/29/2016

Extends Recipe

| **OUTGOING STRUCTURAL RELATIONSHIPS** |
| --- |
| Generalization from ResourceRecipe to Recipe  [ Direction is 'Source -> Destination'. ] |

| **ASSOCIATIONS** | |
| --- | --- |
| Association (direction: Unspecified)  ResourceRecipeProvidesInstructionsFor | |
| Source: Public (Class) ResourceRecipe | Target: Public (Class) ResourceComposition |

## **ResourceSpecCharValueUse**

*AssociationClass in package 'Resource'*

ResourceSpecCharValueUse

Version 1.0 Phase 1.0 Proposed

KS0567 created on 11/15/2016. Last modified 11/15/2016

## **ResourceSpecification**

*Class in package 'Resource'*

ResourceSpecification

Version 1.0 Phase 1.0 Proposed

KS0567 created on 7/20/2016. Last modified 7/29/2016

| **ASSOCIATIONS** | |
| --- | --- |
| Association (direction: Unspecified)  ResourceSpecificationMadeAvailableAs | |
| Source: Public (Class) ResourceSpecification  Cardinality: [1] | Target: Public (Class) ResourceCatalogItem  Cardinality: [0..1] |

|  |  |
| --- | --- |
| Association (direction: Unspecified)  ResourceSpecificationMadeAvailableAs | |
| Source: Public (Class) ResourceSpecification  Cardinality: [1] | Target: Public (Class) ResourceCatalogItem  Cardinality: [0..1] |

## **ScalingAspect**

*Class in package 'Resource'*

Describes the details of an aspect used for horizontal scaling

References:

ETSI GS NFV-IFA 011 V2.1.3

ScalingAspect

Version 1.0 Phase 1.0 Proposed

am803u created on 11/2/2017. Last modified 11/2/2017

| **ATTRIBUTES** |
| --- |
| description : String Public  References:  ETSI GS NFV-IFA 011 V2.1.3  [ Is static False. Containment is Not Specified. ] |

|  |
| --- |
| maxScaleLevel : int Public  The maximum scaleLevel for total number of scaling steps that can be applied w.r.t. this aspect. The value of this attribute corresponds to the number of scaling steps can be applied to this aspect when scaling it from the minimum scale level (i.e. 0) to the maximum scale level defined by this attribute.  References:  ETSI GS NFV-IFA 011 V2.1.3  [ Is static False. Containment is Not Specified. ] |

|  |
| --- |
| name : String Public  References:  ETSI GS NFV-IFA 011 V2.1.3  [ Is static False. Containment is Not Specified. ] |

| **ASSOCIATIONS** | |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) ScalingAspect | Target: Public (Class) VnfdElementGroup  Cardinality: [0..1] |

## **Storage (file or Object)**

*Class in package 'Resource'*

Storage (file or Object)

Version 1.0 Phase 1.0 Proposed

mm7817 created on 7/13/2016. Last modified 7/13/2016

| **ASSOCIATIONS** | |
| --- | --- |
| Association (direction: Source -> Destination)  specifies deployment of | |
| Source: Public (Class) VNF Module (Deployment Group)  Cardinality: [1] | Target: Public (Class) Storage (file or Object)  Cardinality: [0..\*] |

## **SwImageDesc**

*Class in package 'Resource'*

The **SwImageDesc** information element describes requested additional capability for a particular VDU. Such a capability may be for acceleration or specific tasks.

References:

tosca-nfv-YAML-v1.0-wd05-rev02

ETSI GS NFV-IFA 011 V2.1.3

SwImageDesc

Version 1.0 Phase 1.0 Proposed

KS0567 created on 10/12/2017. Last modified 11/1/2017

| **ATTRIBUTES** |
| --- |
| checksum : String Public  Checksum of the software image file  References:  tosca-nfv-YAML-v1.0-wd05-rev02  ETSI GS NFV-IFA 011 V2.1.3  [ Is static False. Containment is Not Specified. ] |

|  |
| --- |
| container\_format : String Public  The container format describes the container file format in which software image is provided.  References:  tosca-nfv-YAML-v1.0-wd05-rev02  ETSI GS NFV-IFA 011 V2.1.3  [ Is static False. Containment is Not Specified. ] |

|  |
| --- |
| disk\_format : String Public  The disk format of a software image is the format of the underlying disk image  References:  tosca-nfv-YAML-v1.0-wd05-rev02  ETSI GS NFV-IFA 011 V2.1.3  [ Is static False. Containment is Not Specified. ] |

|  |
| --- |
| min\_disk : Scalar-Unit-Size Public  The minimal disk size requirement for this software image.  References:  tosca-nfv-YAML-v1.0-wd05-rev02  ETSI GS NFV-IFA 011 V2.1.3  [ Is static False. Containment is Not Specified. ] |

|  |
| --- |
| min\_ram : Scalar-Unit-Size Public  Multiplicity: ( [0..1], Allow duplicates: 0, Is ordered: False )  The minimal RAM requirement for this software image.  References:  tosca-nfv-YAML-v1.0-wd05-rev02  ETSI GS NFV-IFA 011 V2.1.3  [ Is static False. Containment is Not Specified. ] |

|  |
| --- |
| name : String Public  Name of this software image  References:  tosca-nfv-YAML-v1.0-wd05-rev02  ETSI GS NFV-IFA 011 V2.1.3  [ Is static False. Containment is Not Specified. ] |

|  |
| --- |
| operating\_system : String Public  Multiplicity: ( [0..1], Allow duplicates: 0, Is ordered: False )  Identifies the operating system used in the software image.  References:  tosca-nfv-YAML-v1.0-wd05-rev02  ETSI GS NFV-IFA 011 V2.1.3  [ Is static False. Containment is Not Specified. ] |

|  |
| --- |
| size : Scalar-Unit-Size Public  The size of this software image  References:  tosca-nfv-YAML-v1.0-wd05-rev02  ETSI GS NFV-IFA 011 V2.1.3  [ Is static False. Containment is Not Specified. ] |

|  |
| --- |
| supported \_virtualization\_enviroment : String Public  Multiplicity: ( [0..\*], Allow duplicates: 0, Is ordered: False )  Identifies the virtualization environments (e.g. hypervisor) compatible with this software image  References:  tosca-nfv-YAML-v1.0-wd05-rev02  ETSI GS NFV-IFA 011 V2.1.3  [ Is static False. Containment is Not Specified. ] |

|  |
| --- |
| sw\_image : String Public  A reference to the actual software image within VNF Package, or url.  References:  tosca-nfv-YAML-v1.0-wd05-rev02  ETSI GS NFV-IFA 011 V2.1.3  [ Is static False. Containment is Not Specified. ] |

|  |
| --- |
| version : String Public  Version of this software image  References:  tosca-nfv-YAML-v1.0-wd05-rev02  ETSI GS NFV-IFA 011 V2.1.3  [ Is static False. Containment is Not Specified. ] |

| **ASSOCIATIONS** | |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) SwImageDesc  Cardinality: [0..1] | Target: Public (Class) VNFCDesc (VDU) (VNFCCatalogItem)  Cardinality: [1..\*] |

|  |  |
| --- | --- |
| Association (direction: Unspecified)  SwLoadedOnStorage | |
| Source: Public (Class) VirtualStorageDesc  Cardinality: [1..] | Target: Public (Class) SwImageDesc  Cardinality: [0..1] |

## **VDU**

*Class in package 'Resource'*

VDU

Version 1.0 Phase 1.0 Proposed

KS0567 created on 10/12/2017. Last modified 10/12/2017

## **VDUCPInstance (Connection Point)**

*Class in package 'Resource'*

VDUCPInstance (Connection Point)

Version 1.0 Phase 1.0 Proposed

KS0567 created on 10/11/2017. Last modified 10/17/2017

| **OUTGOING STRUCTURAL RELATIONSHIPS** |
| --- |
| Aggregation from VDUCPInstance (Connection Point) to VNFCLinkPort  [ Name is LinkPointHas. Direction is 'Source -> Destination'. ] |

| **ASSOCIATIONS** | |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) VNFCCPDesc (VNFC Connection Point Desc) (VDUCPD)  Cardinality: [1] | Target: Public (Class) VDUCPInstance (Connection Point)  Cardinality: [\*] |

## **VDULinkPortDescriptor**

*Class in package 'Resource'*

End point of virtual link related to some VDU.

VDULinkPortDescriptor

Version 1.0 Phase 1.0 Proposed

KS0567 created on 10/11/2017. Last modified 10/18/2017

| **ASSOCIATIONS** | |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) VDULinkPortDescriptor | Target: Public (Class) VNFCCPDesc (VNFC Connection Point Desc) (VDUCPD) |

|  |  |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) VDULinkPortDescriptor | Target: Public (Class) VNFCLinkPort |

|  |  |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) VDULinkPortDescriptor | Target: Public (Class) VNFVirtualLinkDesc (VLD) |

## **VDUProfile**

*Class in package 'Resource'*

The **VduProfile** describes additional instantiation data for a given VDU used in a DF (deployment flavor).

References:

ETSI GS NFV-IFA 011 V2.1.3

VDUProfile

Version 1.0 Phase 1.0 Proposed

KS0567 created on 10/12/2017. Last modified 11/1/2017

| **OUTGOING STRUCTURAL RELATIONSHIPS** |
| --- |
| Aggregation from VDUProfile to VNFCDesc (VDU) (VNFCCatalogItem)  [ Direction is 'Source -> Destination'. ] |

| **ASSOCIATIONS** | |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) VDUProfile  Cardinality: [0..1] | Target: Public (Class) VnfDeploymentFlavor (Vnfdf)  Cardinality: [1] |

## **VF Deployment Group (aka VF Module)**

*Class in package 'Resource'*

ECOMP supports the concept of VF Modularity. With this approach, a single VF may be composed from one or more Heat templates, each of which represents some subset of the overall VF. These component parts are referred to as “VF Modules”. During orchestration, these modules may be deployed incrementally to build up the complete VF.

To accommodate shared resources across the entire VF (private networks, server groups, etc.), one module is designated as a “base” module. Any resources defined in the base module template can be exposed to all other modules by declaring their resource UUIDs as Heat outputs. Those outputs will be provided by ECOMP as input parameters to all other templates. This mechanism is analogous to ECOMP handling of persistent Cinder volumes.

VF modules contain the instructions needed to instantiate a VF instance. For example in the OpenStack environment a single VF module represents a single HEAT stack. A VF module may represent an initial base deployment of VFCs or an incremental deployment t of VFCs hat can be added/removed for scale.

A VF Module can contain one or more VFC types associated with a particular VF Instance

VF Deployment Group (aka VF Module)

Version 1.0 Phase 1.0 Proposed

mm7817 created on 6/22/2016. Last modified 7/13/2016

| **ASSOCIATED FILES** |
| --- |
| Web Address. https://tspace.web.att.com/files/app#/file/61874965-5bdf-40f4-aa96-0f7159ab4858  TSPACE Link for VM Module definition |

| **OUTGOING STRUCTURAL RELATIONSHIPS** |
| --- |
| Aggregation from VF Deployment Group (aka VF Module) to VNFInstance  [ Direction is 'Source -> Destination'. ] |

| **ATTRIBUTES** |
| --- |
| AvailabilityZoneCounts : int Private  Quantity of Availability Zones needed for this VF-Module. Extracted from VF-Module HEAT template. Quantity of unique Availability Zone names in the VF-module HEAT template  [ Is static False. Containment is Not Specified. ] |

|  |
| --- |
| ContrailServiceInstance : boolean Private  "Y" indicates that this VNF contains a Contrail Service Instance  [ Is static False. Containment is Not Specified. ] |

|  |
| --- |
| ModuleAssignements : int Private  [ Is static False. Containment is Not Specified. ] |

|  |
| --- |
| VF-ModuleDescription : string Private  Description of the VF-modules contents and purpose (e.g. "Front-End" or "Database Cluster")  [ Is static False. Containment is Not Specified. ] |

|  |
| --- |
| VF-ModuleLabel : string Private  Alternate textual key used to reference this VF-Module model. Must be unique within the VNF model  [ Is static False. Containment is Not Specified. ] |

|  |
| --- |
| VF-ModuleModelUUID : int Private  Internal ASDC VF-Module model identifier. (Uniquely identifies the module, but may need to contain metadata to tie it back to the parent VNF)  [ Is static False. Containment is Not Specified. ] |

|  |
| --- |
| VF-ModuleModelVersion : string Private  Internal ASDC VF-Module model version  [ Is static False. Containment is Not Specified. ] |

|  |
| --- |
| VF-ModuleModuleType : Enumerated Private  "Base" or "Expansion". Base module HEAT template must include all of the intra-VNF networks that are used across VF-modules. Networks that are self-contained to a VF-module are allowed in Expansion modules. Assume intra-VNF networks use private addressing defined in the HEAT template, therefore no network assignment needed  [ Is static False. Containment is Not Specified. ] |

|  |
| --- |
| VMAssignmentsFile : FILE Private  [ Is static False. Containment is Not Specified. ] |

|  |
| --- |
| VMAssignmentssPrompt : boolean Private  [ Is static False. Containment is Not Specified. ] |

|  |
| --- |
| VolumeGroup : boolean Private  "Y" indicates that this VF Module model requires attachment to a Volume Group. VID operator must select the Volume Group instance to atach to a VF-Module at deployment time.  [ Is static False. Containment is Not Specified. ] |

## **VFModule**

*Class in package 'Resource'*

VFModule

Version 1.0 Phase 1.0 Proposed

KS0567 created on 10/19/2017. Last modified 10/19/2017

| **ASSOCIATIONS** | |
| --- | --- |
| Association (direction: Unspecified)  Same Thing???? | |
| Source: Public (Class) VFModule | Target: Public (Class) VnfElementGroup |

## **VM Virtual Machine**

*Class in package 'Resource'*

VM Virtual Machine

Version 1.0 Phase 1.0 Proposed

MM7817 created on 7/6/2016. Last modified 10/12/2017

| **ASSOCIATIONS** | |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) VM Virtual Machine  Cardinality: [1..\*] | Target: Public (Class) PNFnstance  Cardinality: [1] |

|  |  |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) Docker or Linux ContainerInstance (Type 2)  Cardinality: [0..\*] | Target: Public (Class) VM Virtual Machine  Cardinality: [1] |

## **VNF Module (Deployment Group)**

*Class in package 'Resource'*

ECOMP supports the concept of VF Modularity. With this approach, a single VF may be composed from one or more Heat templates, each of which represents some subset of the overall VF. These component parts are referred to as “VF Modules”. During orchestration, these modules may be deployed incrementally to build up the complete VF.

To accommodate shared resources across the entire VF (private networks, server groups, etc.), one module is designated as a “base” module. Any resources defined in the base module template can be exposed to all other modules by declaring their resource UUIDs as Heat outputs. Those outputs will be provided by ECOMP as input parameters to all other templates. This mechanism is analogous to ECOMP handling of persistent Cinder volumes.

VF modules contain the instructions needed to instantiate a VF instance. For example in the OpenStack environment a single VF module represents a single HEAT stack. A VF module may represent an initial base deployment of VFCs or an incremental deployment t of VFCs hat can be added/removed for scale.

A VF Module can contain one or more VFC types associated with a particular VF Instance

VNF Module (Deployment Group)

Version 1.0 Phase 1.0 Proposed

mm7817 created on 7/13/2016. Last modified 7/13/2016

| **CONNECTORS** |
| --- |
| **Dependency** realizedBy Source -> Destination  From: VNF Module (Deployment Group) : Class, Public  To: Heat Stack : DataType, Public |

| **ASSOCIATIONS** | |
| --- | --- |
| Association (direction: Source -> Destination)  specifiesConncetivity | |
| Source: Public (Class) VNF Module (Deployment Group)  Cardinality: [1] | Target: Public (Class) Network  Cardinality: [0..\*] |

|  |  |
| --- | --- |
| Association (direction: Source -> Destination)  specifies deployment of | |
| Source: Public (Class) VNF Module (Deployment Group)  Cardinality: [1] | Target: Public (Class) Storage (file or Object)  Cardinality: [0..\*] |

|  |  |
| --- | --- |
| Association (direction: Source -> Destination)  specifiesConncetivity | |
| Source: Public (Class) VNF Module (Deployment Group)  Cardinality: [1] | Target: Public (Class) Network  Cardinality: [0..\*] |

|  |  |
| --- | --- |
| Association (direction: Source -> Destination)  specifiesConncetivity | |
| Source: Public (Class) VNF Module (Deployment Group)  Cardinality: [1] | Target: Public (Class) Network  Cardinality: [0..\*] |

|  |  |
| --- | --- |
| Association (direction: Source -> Destination)  Lifecycle operations use | |
| Source: Public (Class) VNFInstance | Target: Public (Class) VNF Module (Deployment Group) |

## **VNFC Instance**

*Class in package 'Resource'*

1. A VNFC Instance is an internal component of a VNF Instance, providing a defined sub-set of the VNF's functionality.
2. One VNFC instance per VM is an AT&T imposed constraint. It is in alignment with ETSI. The constraint is violated by some VNF's in Hosted VoIP (provided by Alcatel-Lucent/Nokia)

VNFC Instance

Version 1.0 Phase 1.0 Proposed

mm7817 created on 7/13/2016. Last modified 4/3/2017

Extends NetworkFunctionAtomic

| **OUTGOING STRUCTURAL RELATIONSHIPS** |
| --- |
| Generalization from VNFC Instance to NetworkFunctionAtomic  [ Direction is 'Source -> Destination'. ] |

| **ASSOCIATIONS** | |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) VNFC Instance  Cardinality: [1] | Target: Public (Class) Docker or Linux Container Instance  Cardinality: [1] |

|  |  |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) VNFC Instance  Cardinality: [1] | Target: Public (Class) Docker or Linux Container Instance (Type 3 - Bare Metal)  Cardinality: [1] |

|  |  |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) VNFC Instance  Cardinality: [0..1] | Target: Public (Class) VNFCLinkPort  Cardinality: [1..\*] |

|  |  |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) VNFC Instance  Cardinality: [1] | Target: Public (Class) Docker or Linux ContainerInstance (Type 2)  Cardinality: [1] |

|  |  |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) VNFC Instance  Cardinality: [1] | Target: Public (Class) Virtual Machine (Type 1 - vServer)  Cardinality: [1] |

|  |  |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) Vnfc (ETSI) | Target: Public (Class) VNFC Instance |

|  |  |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) VNFInstance  Cardinality: [1] | Target: Public (Class) VNFC Instance  Cardinality: [1..\*] |

## **VNFCCPDesc (VNFC Connection Point Desc) (VDUCPD)**

*Class in package 'Resource'*

A **VNFCCPDesc** information element is a type of Cpd and describes network connectivity between a VNFC instance (based on this VDU) and an internal VL.

A VduCpd inherits from the Cpd Class. All attributes of the Cpd are also attributes of the VduCpd

References:

tosca-nfv-YAML-v1.0-wd05-rev02 (VduCpd)

ETSI GS NFV-IFA 011 V2.1.3 (VduCpd)

VNFCCPDesc (VNFC Connection Point Desc) (VDUCPD)

Version 1.0 Phase 1.0 Proposed

KS0567 created on 10/11/2017. Last modified 11/1/2017

Extends CPDesc

| **OUTGOING STRUCTURAL RELATIONSHIPS** |
| --- |
| Generalization from VNFCCPDesc (VNFC Connection Point Desc) (VDUCPD) to CPDesc  [ Direction is 'Source -> Destination'. ] |

| **INCOMING STRUCTURAL RELATIONSHIPS** |
| --- |
| Generalization from VnfIntCPDesc to VNFCCPDesc (VNFC Connection Point Desc) (VDUCPD)  [ Direction is 'Source -> Destination'. ] |

|  |
| --- |
| Generalization from VnfExtCPDesc to VNFCCPDesc (VNFC Connection Point Desc) (VDUCPD)  [ Direction is 'Source -> Destination'. ] |

| **ATTRIBUTES** |
| --- |
| bitrateRequirement : int Public  Multiplicity: ( [0..1], Allow duplicates: 0, Is ordered: False )  Bitrate requirement on this CP.  References:  tosca-nfv-YAML-v1.0-wd05-rev02  ETSI GS NFV-IFA 011 V2.1.3  [ Is static False. Containment is Not Specified. ] |

|  |
| --- |
| logicalNodeRequirements : NameValuePair Public  Multiplicity: ( [0..\*], Allow duplicates: 0, Is ordered: False )  Describes the CPD with any logical node I/O requirements (for network devices) that may have been created. Linking these attributes is necessary so that so that I/O requirements that need to be articulated at the logical node level can be associated with the network interface requirements associated with the CPD.  References:  tosca-nfv-YAML-v1.0-wd05-rev02 (not represented)  ETSI GS NFV-IFA 011 V2.1.3 (nicIoRequirements & logicalNodeData)  [ Is static False. Containment is Not Specified. ] |

|  |
| --- |
| virtualNetworkInterfaceRequirements : NameValuePair Public  Multiplicity: ( [0..\*], Allow duplicates: 0, Is ordered: False )  Specifies requirements on a virtual network interface realising the CPs instantiated from this CPD  References:  tosca-nfv-YAML-v1.0-wd05-rev02 (VirtualNetworkInterfaceRequirements)  ETSI GS NFV-IFA 011 V2.1.3 (VirtualNetworkInterfaceRequirements)  [ Is static False. Containment is Not Specified. ] |

| **ASSOCIATIONS** | |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) VNFCCPDesc (VNFC Connection Point Desc) (VDUCPD)  Cardinality: [1] | Target: Public (Class) VDUCPInstance (Connection Point)  Cardinality: [\*] |

|  |  |
| --- | --- |
| Association (direction: Unspecified)  InternalCPD | |
| Source: Public (Class) VNFCCPDesc (VNFC Connection Point Desc) (VDUCPD)  Cardinality: [1..\*] | Target: Public (Class) VNFCDesc (VDU) (VNFCCatalogItem)  Cardinality: [1..\*] |

|  |  |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) VDULinkPortDescriptor | Target: Public (Class) VNFCCPDesc (VNFC Connection Point Desc) (VDUCPD) |

## **VNFCConfiguration**

*Class in package 'Resource'*

VNFCConfiguration

Version 1.0 Phase 1.0 Proposed

KS0567 created on 8/17/2017. Last modified 8/23/2017

| **ASSOCIATIONS** | |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) VNFCConfiguration | Target: Public (Class) VNFCDesc (VDU) (VNFCCatalogItem) |

## **VNFCDesc (VDU) (VNFCCatalogItem)**

*Class in package 'Resource'*

The Virtualisation Deployment Unit (VDU) is a construct supporting the description of the deployment and operational behaviour of a VNFC.

A VNFC instance created based on the VDU maps to a single virtualisation container (e.g. a VM).

A VNFC will only be in one VNFDesc. If a vendor wants to use the VNFC in mupliple VNFDesc (their product) they can do so, but it will be 'repeated'.

References:

tosca-nfv-YAML-v1.0-wd05-rev02

ETSI GS NFV-IFA 011 V2.1.3

VNFCDesc (VDU) (VNFCCatalogItem)

Version 1.0 Phase 1.0 Proposed

KS0567 created on 8/17/2017. Last modified 10/20/2017

| **OUTGOING STRUCTURAL RELATIONSHIPS** |
| --- |
| Aggregation from VNFCDesc (VDU) (VNFCCatalogItem) to VNFDesc (VNFCatalogItem)  [ Direction is 'Source -> Destination'. ] |

| **INCOMING STRUCTURAL RELATIONSHIPS** |
| --- |
| Aggregation from VDUProfile to VNFCDesc (VDU) (VNFCCatalogItem)  [ Direction is 'Source -> Destination'. ] |

| **ATTRIBUTES** |
| --- |
| additionalVnfcConfigurableProperty : ConfigurableProperties Public  This information element defines the configurable properties of a VNFC. For a VNFC instance, the value of these properties can be modified through the VNFM.  References:  ETSI GS NFV-IFA 011 V2.1.3  tosca-nfv-YAML-v1.0-wd05-rev02 (configurable\_properties)  [ Is static False. Containment is Not Specified. ] |

|  |
| --- |
| boot\_order : String Public  Multiplicity: ( [0..\*], Allow duplicates: 0, Is ordered: False )  The key indicates the boot index (lowest index defines highest boot priority). The Value references a descriptor from which a valid boot device is created e.g. VirtualStorageDescriptor from which a VirtualStorage instance is created.  References:  tosca-nfv-YAML-v1.0-wd05-rev02  ETSI GS NFV-IFA 011 V2.1.3  [ Is static False. Containment is Not Specified. ] |

|  |
| --- |
| description : String Public  Human readable description of the Vdu  References:  tosca-nfv-YAML-v1.0-wd05-rev02  ETSI GS NFV-IFA 011 V2.1.3  [ Is static False. Containment is Not Specified. ] |

|  |
| --- |
| name : String Public  Human readable name of the Vdu  References:  tosca-nfv-YAML-v1.0-wd05-rev02  ETSI GS NFV-IFA 011 V2.1.3  [ Is static False. Containment is Not Specified. ] |

|  |
| --- |
| nfvi\_constraints : String Public  Multiplicity: ( [0..\*], Allow duplicates: 0, Is ordered: False )  Describes constraints on the NFVI for the VNFC instance(s) created from this Vdu. For example, aspects of a secure hosting environment for the VNFC instance that involve additional entities or processes. More software images can be attached to the virtualization container using virtual\_storage.  References:  tosca-nfv-YAML-v1.0-wd05-rev02  ETSI GS NFV-IFA 011 V2.1.3  [ Is static False. Containment is Not Specified. ] |

| **ASSOCIATIONS** | |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) VNFCDesc (VDU) (VNFCCatalogItem) | Target: Public (Class) MonitoringParameterDesc  Cardinality: [0..\*] |

|  |  |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) VNFCDesc (VDU) (VNFCCatalogItem) | Target: Public (Class) Vdu |

|  |  |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) SwImageDesc  Cardinality: [0..1] | Target: Public (Class) VNFCDesc (VDU) (VNFCCatalogItem)  Cardinality: [1..\*] |

|  |  |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) VNFCCapability  Cardinality: [1..\*] | Target: Public (Class) VNFCDesc (VDU) (VNFCCatalogItem) |

|  |  |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) VnfdElementGroup | Target: Public (Class) VNFCDesc (VDU) (VNFCCatalogItem)  Cardinality: [0..\*] |

|  |  |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) VNFVirtualLinkDesc (VLD) | Target: Public (Class) VNFCDesc (VDU) (VNFCCatalogItem) |

|  |  |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) VirtualStorageDesc  Cardinality: [0..\*] | Target: Public (Class) VNFCDesc (VDU) (VNFCCatalogItem) |

|  |  |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) VirtualComputeDesc  Cardinality: [1] | Target: Public (Class) VNFCDesc (VDU) (VNFCCatalogItem) |

|  |  |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) VnfDeploymentFlavor (Vnfdf)  Cardinality: [0..\*] | Target: Public (Class) VNFCDesc (VDU) (VNFCCatalogItem) |

|  |  |
| --- | --- |
| Association (direction: Unspecified)  InternalCPD | |
| Source: Public (Class) VNFCCPDesc (VNFC Connection Point Desc) (VDUCPD)  Cardinality: [1..\*] | Target: Public (Class) VNFCDesc (VDU) (VNFCCatalogItem)  Cardinality: [1..\*] |

|  |  |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) ElementGroup | Target: Public (Class) VNFCDesc (VDU) (VNFCCatalogItem) |

|  |  |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) VFC | Target: Public (Class) VNFCDesc (VDU) (VNFCCatalogItem) |

|  |  |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) VnfcConfigurableProperties (or SID Characteristic Pattern) | Target: Public (Class) VNFCDesc (VDU) (VNFCCatalogItem) |

|  |  |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) VNFCConfiguration | Target: Public (Class) VNFCDesc (VDU) (VNFCCatalogItem) |

## **VNFCLinkPort**

*Class in package 'Resource'*

Groups connection points together.

VNFCLinkPort

Version 1.0 Phase 1.0 Proposed

KS0567 created on 10/11/2017. Last modified 10/17/2017

| **INCOMING STRUCTURAL RELATIONSHIPS** |
| --- |
| Aggregation from VDUCPInstance (Connection Point) to VNFCLinkPort  [ Name is LinkPointHas. Direction is 'Source -> Destination'. ] |

| **ASSOCIATIONS** | |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) VNFC Instance  Cardinality: [0..1] | Target: Public (Class) VNFCLinkPort  Cardinality: [1..\*] |

|  |  |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) VDULinkPortDescriptor | Target: Public (Class) VNFCLinkPort |

## **VNFDesc (VNFCatalogItem)**

*Class in package 'Resource'*

A **VNF** is a collection of VNF Components.

A **VNFD** is a deployment template which describes a VNF in terms of deployment and operational behaviour requirements. It also contains connectivity, interface and virtualised resource requirements.

References:

tosca-nfv-YAML-v1.0-wd05-rev02 (tosca.nodes.nfv.vnfd, but node details are not defined)

ETSI GS NFV-IFA 011 V2.1.3 (VNFD)

VNFDesc (VNFCatalogItem)

Version 1.0 Phase 1.0 Proposed

KS0567 created on 6/19/2017. Last modified 11/1/2017

Extends ResourceCatalogItem

| **OUTGOING STRUCTURAL RELATIONSHIPS** |
| --- |
| Generalization from VNFDesc (VNFCatalogItem) to ResourceCatalogItem  [ Direction is 'Source -> Destination'. ] |

| **INCOMING STRUCTURAL RELATIONSHIPS** |
| --- |
| Aggregation from VNFCDesc (VDU) (VNFCCatalogItem) to VNFDesc (VNFCatalogItem)  [ Direction is 'Source -> Destination'. ] |

|  |
| --- |
| Aggregation from NFDescription to VNFDesc (VNFCatalogItem)  [ Direction is 'Source -> Destination'. ] |

| **ATTRIBUTES** |
| --- |
| autoScaleRule : String Public  Rule that determines when a scaling action needs to be triggered on a VNF instance e.g. based on certain VNF indicator values or VNF indicator value changes or a combination of VNF indicator value(s) and monitoring parameter(s).  References:  ETSI GS NFV-IFA 011 V2.1.3  [ Is static False. Containment is Not Specified. ] |

|  |
| --- |
| configurableProperties : ConfigurableProperties Public  Multiplicity: ( [0..\*], Allow duplicates: 0, Is ordered: False )  Describes the configurable properties of the VNF (e.g. related to auto scaling and auto healing).  References:  ETSI GS NFV-IFA 011 V2.1.3  [ Is static False. Containment is Not Specified. ] |

|  |
| --- |
| description : String Public  Human readable description of the VNF Product. Can change during the VNF Product lifetime.  References:  tETSI GS NFV-IFA 011 V2.1.3 (vnfProductInfoDescription)  [ Is static False. Containment is Not Specified. ] |

|  |
| --- |
| indicators : NameValuePair Public  Multiplicity: ( [0..\*], Allow duplicates: 0, Is ordered: False )  Declares the VNF indicators that are supported by this VNF, along with allowed values.  References:  ETSI GS NFV-IFA 011 V2.1.3  [ Is static False. Containment is Not Specified. ] |

|  |
| --- |
| logo : String Private  File path of the vendor-specific logo.  [ Is static False. Containment is Not Specified. ] |

|  |
| --- |
| modifiableAttributes : NameValuePair Public  Multiplicity: ( [0..\*], Allow duplicates: 0, Is ordered: False )  Describes the VNF-specific attributes that are modifiable  References:  ETSI GS NFV-IFA 011 V2.1.3  [ Is static False. Containment is Not Specified. ] |

|  |
| --- |
| name : String Public  Name to identify the VNF Product. Invariant for the VNF Product lifetime  References:  ETSI GS NFV-IFA 011 V2.1.3 (vnfProductName)  [ Is static False. Containment is Not Specified. ] |

|  |
| --- |
| provider : String Public  Provider of the VNFD  References:  ETSI GS NFV-IFA 011 V2.1.3 (vnfProvider)  [ Is static False. Containment is Not Specified. ] |

|  |
| --- |
| short-name : String Public  VNFD short name to use as a label in the UI.  Human readable name for the VNF Product. Can change during the VNF Product lifetime.  References:  ETSI GS NFV-IFA 011 V2.1.3 (vnfProductInfoName)  [ Is static False. Containment is Not Specified. ] |

|  |
| --- |
| swVersion : String Public  Software version of the VNF. This is changed when there is any change to the software that is included in the VNF Package  References:  ETSI GS NFV-IFA 011 V2.1.3 (vnfSoftwareVersion)  [ Is static False. Containment is Not Specified. ] |

|  |
| --- |
| version : String Public  Version of the VNFD.  References:  ETSI GS NFV-IFA 011 V2.1.3 (vnfdVersion)  [ Is static False. Containment is Not Specified. ] |

| **ASSOCIATIONS** | |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) VNFDesc (VNFCatalogItem) | Target: Public (Class) LifeCycleManagementOperationDesc  Cardinality: [0..\*] |

|  |  |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) VNFDesc (VNFCatalogItem) | Target: Public (Class) VirtualStorageDesc  Cardinality: [0..\*] |

|  |  |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) VNFDesc (VNFCatalogItem) | Target: Public (Class) VnfDeploymentFlavor (Vnfdf)  Cardinality: [1..\*] |

|  |  |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) VNFDesc (VNFCatalogItem) | Target: Public (Class) VnfElementGroup |

|  |  |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) VNFDesc (VNFCatalogItem) | Target: Public (Class) VnfdElementGroup  Cardinality: [0..\*] |

|  |  |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) VNFDesc (VNFCatalogItem) | Target: Public (Class) Vnfd |

|  |  |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) VNFDesc (VNFCatalogItem) | Target: Public (Class) VnfExtCPDesc  Cardinality: [1..\*] |

|  |  |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) VNFDesc (VNFCatalogItem) | Target: Public (Class) VNFVirtualLinkDesc (VLD)  Cardinality: [0..\*] |

|  |  |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) VNFDesc (VNFCatalogItem) | Target: Public (Class) VirtualComputeDesc  Cardinality: [0..\*] |

|  |  |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) VNFDesc (VNFCatalogItem) | Target: Public (Class) ResourceCatalogItem |

|  |  |
| --- | --- |
| Association (direction: Unspecified)  VNFCatalogItemMadeAvaiableAs | |
| Source: Public (Class) VNFDesc (VNFCatalogItem)  Cardinality: [1] | Target: Public (Class) VNFInstance  Cardinality: [0..\*] |

|  |  |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) ElementGroup | Target: Public (Class) VNFDesc (VNFCatalogItem) |

|  |  |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) MonitoringParameterDesc | Target: Public (Class) VNFDesc (VNFCatalogItem) |

|  |  |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) ElementGroup | Target: Public (Class) VNFDesc (VNFCatalogItem) |

|  |  |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) VF | Target: Public (Class) VNFDesc (VNFCatalogItem) |

|  |  |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) VnfcConfigurableProperties (or SID Characteristic Pattern) | Target: Public (Class) VNFDesc (VNFCatalogItem) |

## **VNFImage**

*Class in package 'Resource'*

VNFImage

Version 1.0 Phase 1.0 Proposed

mm7817 created on 7/13/2016. Last modified 7/13/2016

| **ASSOCIATIONS** | |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) VNFImage  Cardinality: [1] | Target: Public (Class) VNFInstance  Cardinality: [1] |

## **VNFInstance**

*Class in package 'Resource'*

A Virtual Function (VF) is a type of resource. This resource performs some function as part of a service and then a product, consumed by some customer.

VF's will be managed via Software Defined Network (SDN-C) and application controllers. VF's are instantiated via Master Service Orchestrator (MSO). Homing rules and VM allocation may specify all VFC;s need to run within localized containers and hardware, hence we do not have a relationship between VFInstance and PhysicalResourceInstance. That relationship can be derived by examining the VFC containers.

VNFInstance

Version 1.0 Phase 1.0 Proposed

ks0567 created on 10/28/2015. Last modified 8/23/2017

Extends NetworkFunctionAtomic, ResourceInstance

| **OUTGOING STRUCTURAL RELATIONSHIPS** |
| --- |
| Generalization from VNFInstance to ResourceInstance  [ Direction is 'Source -> Destination'. ] |

|  |
| --- |
| Generalization from VNFInstance to NetworkFunctionAtomic  [ Direction is 'Source -> Destination'. ] |

|  |
| --- |
| Generalization from VNFInstance to ResourceInstance  [ Direction is 'Source -> Destination'. ] |

| **INCOMING STRUCTURAL RELATIONSHIPS** |
| --- |
| Aggregation from VF Deployment Group (aka VF Module) to VNFInstance  [ Direction is 'Source -> Destination'. ] |

|  |
| --- |
| Aggregation from NFDescription to VNFInstance  [ Direction is 'Source -> Destination'. ] |

| **ATTRIBUTES** |
| --- |
| Homing Policy : Homing Policy ID Private  Reference to VNF-level homing policy that ECOMP will use when VNF deployment target node is auto-selected  [ Is static False. Containment is Not Specified. ] |

|  |
| --- |
| Network Role : Enumerated Private  Sourced from set of all network roles that will exist in inventory. Network Role must exist in inventory at orchestration time for this VNF  [ Is static False. Containment is Not Specified. ] |

|  |
| --- |
| Target Node Prompt : boolean Private  "Y" indicates operator-supplied VNF instance target deployment node required. Present prompt to operator: "Enter target node for deployment of this VNF instance"  "N" indicates that the target deployment node for this VNF instance will be auto-selected by ECOMP  [ Is static False. Containment is Not Specified. ] |

|  |
| --- |
| VF Type : string Private  Human readable VNF type description  [ Is static False. Containment is Not Specified. ] |

|  |
| --- |
| VLAN Range Plan : VLAN Range Plan ID Private  Identifies the VNF-level VLAN Range Plan that must be used by ECOMP to assign VLAN tags to an instance of this VNF type  [ Is static False. Containment is Not Specified. ] |

|  |
| --- |
| VNF Model ID : VNF Model UUID Private  Internal ASDC VNF model identifier.  [ Is static False. Containment is Not Specified. ] |

|  |
| --- |
| VNF Model Version : VNF Model Version UUID Private  Internal ASDC VNF Model version  [ Is static False. Containment is Not Specified. ] |

|  |
| --- |
| VNF Name Prompt : boolean Private  "Y" indicates operator-supplied VNF name required. Present prompt to operator: "Enter the name for this VNF instance"  "N" indicates that the name for the VNF instance will be auto-generated by ECOMP  [ Is static False. Containment is Not Specified. ] |

|  |
| --- |
| VNF Naming Policy : boolean Private  Reference to VNF-level naming policy that ECOMP will use when VNF-level name is auto-generated  [ Is static False. Containment is Not Specified. ] |

|  |
| --- |
| VNF Network Tag : Enumerated Private  Must correlate to the set of defined “network-role” identifiers from the associated HEAT templates  [ Is static False. Containment is Not Specified. ] |

| **ASSOCIATIONS** | |
| --- | --- |
| Association (direction: Unspecified)  Bare Metal | |
| Source: Public (Class) VNFInstance  Cardinality: [0..\*] | Target: Public (Class) pServer (host)  Cardinality: [1] |

|  |  |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) VNFInstance  Cardinality: [0..\*] | Target: Public (Class) L3 Network  Cardinality: [1..\*] |

|  |  |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) VNFInstance  Cardinality: [1..\*] | Target: Public (Class) Docker or Linux ContainerInstance (Type 2)  Cardinality: [1] |

|  |  |
| --- | --- |
| Association (direction: Source -> Destination)  Lifecycle operations use | |
| Source: Public (Class) VNFInstance | Target: Public (Class) VNF Module (Deployment Group) |

|  |  |
| --- | --- |
| Association (direction: Unspecified)  EntitlementInstanceSpecifiiesRightToUse | |
| Source: Public (Class) VNFInstance  Cardinality: [0..\*] | Target: Public (Class) EntitlementInstance  Cardinality: [0..\*] |

|  |  |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) VNFInstance  Cardinality: [1..\*] | Target: Public (Class) Network  Cardinality: [1..\*] |

|  |  |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) VNFInstance  Cardinality: [1] | Target: Public (Class) VNFC Instance  Cardinality: [1..\*] |

|  |  |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) VNFInstance  Cardinality: [1..\*] | Target: Public (Class) Network  Cardinality: [1..\*] |

|  |  |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) VNFInstance  Cardinality: [1] | Target: Public (Class) Virtual Machine (Type 1 - vServer)  Cardinality: [1] |

|  |  |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) VNFInstance  Cardinality: [1..\*] | Target: Public (Class) Network  Cardinality: [1..\*] |

|  |  |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) VNF (ETSI) | Target: Public (Class) VNFInstance |

|  |  |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) VNFImage  Cardinality: [1] | Target: Public (Class) VNFInstance  Cardinality: [1] |

|  |  |
| --- | --- |
| Association (direction: Unspecified)  ProductHas | |
| Source: Public (Class) CustomerLicenseKey  Cardinality: [0..\*] | Target: Public (Class) VNFInstance  Cardinality: [0..1] |

|  |  |
| --- | --- |
| Association (direction: Unspecified)  LicenseKeyInstanceProvidesProofOfAuthorizationFor | |
| Source: Public (Class) LicenseKeyInstance  Cardinality: [0..\*] | Target: Public (Class) VNFInstance  Cardinality: [0..\*] |

|  |  |
| --- | --- |
| Association (direction: Unspecified)  VNFCatalogItemMadeAvaiableAs | |
| Source: Public (Class) VNFDesc (VNFCatalogItem)  Cardinality: [1] | Target: Public (Class) VNFInstance  Cardinality: [0..\*] |

|  |  |
| --- | --- |
| Association (direction: Unspecified)  ControllerManages | |
| Source: Public (Class) ControllerInstance (Management Software) | Target: Public (Class) VNFInstance |

## **VNFVirtualLinkDesc (VLD)**

*Class in package 'Resource'*

The **VnfVirtualLinkDesc** information element supports providing information about an internal VNF VL.

References:

tosca-nfv-YAML-v1.0-wd05-rev02

ETSI GS NFV-IFA 011 V2.1.3

VNFVirtualLinkDesc (VLD)

Version 1.0 Phase 1.0 Proposed

KS0567 created on 10/11/2017. Last modified 11/1/2017

| **INCOMING STRUCTURAL RELATIONSHIPS** |
| --- |
| Aggregation from VirtualLinkDescFlavour to VNFVirtualLinkDesc (VLD)  [ Direction is 'Source -> Destination'. ] |

| **ATTRIBUTES** |
| --- |
| connectivityType : ConfigurableProperties Public  Specifies the protocol exposed by this VL (e.g., Ethernet, MPLS, ODU2, IPV4, IPV6, Pseudo-Wire), along with the flow pattern of the connectivity (Line, Tree, Mesh).  References:  tosca-nfv-YAML-v1.0-wd05-rev02  ETSI GS NFV-IFA 011 V2.1.3  [ Is static False. Containment is Not Specified. ] |

|  |
| --- |
| description : String Public  Multiplicity: ( [0..1], Allow duplicates: 0, Is ordered: False )  Provides human-readable information on the purpose of the VL (e.g. control plane traffic).  References:  tosca-nfv-YAML-v1.0-wd05-rev02  ETSI GS NFV-IFA 011 V2.1.3  [ Is static False. Containment is Not Specified. ] |

|  |
| --- |
| testAccess : String Private  Multiplicity: ( [0..\*], Allow duplicates: 0, Is ordered: False )  Specifies test access facilities expected on the VL (e.g. none, passive monitoring, or active (intrusive) loopbacks at endpoints.  References:  tosca-nfv-YAML-v1.0-wd05-rev02  ETSI GS NFV-IFA 011 V2.1.3  [ Is static False. Containment is Not Specified. ] |

| **ASSOCIATIONS** | |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) VNFVirtualLinkDesc (VLD) | Target: Public (Class) VNFCDesc (VDU) (VNFCCatalogItem) |

|  |  |
| --- | --- |
| Association (direction: Unspecified)  InternalVLD | |
| Source: Public (Class) VnfIntCPDesc  Cardinality: [\*] | Target: Public (Class) VNFVirtualLinkDesc (VLD)  Cardinality: [0..1] |

|  |  |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) VnfExtCPDesc | Target: Public (Class) VNFVirtualLinkDesc (VLD)  Cardinality: [0..1] |

|  |  |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) VNFDesc (VNFCatalogItem) | Target: Public (Class) VNFVirtualLinkDesc (VLD)  Cardinality: [0..\*] |

|  |  |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) MonitoringParameterDesc  Cardinality: [0..\*] | Target: Public (Class) VNFVirtualLinkDesc (VLD) |

|  |  |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) VnfdElementGroup | Target: Public (Class) VNFVirtualLinkDesc (VLD)  Cardinality: [0..\*] |

|  |  |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) VDULinkPortDescriptor | Target: Public (Class) VNFVirtualLinkDesc (VLD) |

## **VirtualCPUDesc**

*Class in package 'Resource'*

The **VirtualCpu** information element supports the specification of requirements related to virtual CPU(s) of a virtual compute resource.

References:

tosca-nfv-YAML-v1.0-wd05-rev02

ETSI GS NFV-IFA 011 V2.1.3

VirtualCPUDesc

Version 1.0 Phase 1.0 Proposed

am803u created on 10/30/2017. Last modified 11/3/2017

| **ATTRIBUTES** |
| --- |
| cpuArchitecture : String Public  Multiplicity: ( [0..1], Allow duplicates: 0, Is ordered: False )  CPU architecture type. Examples are x86, ARM.  References:  tosca-nfv-YAML-v1.0-wd05-rev02 (cpu\_architecture)  ETSI GS NFV-IFA 011 V2.1.3  [ Is static False. Containment is Not Specified. ] |

|  |
| --- |
| cpuPinningMap : String Public  If cpuPinningPolicy is defined as "static", the cpuPinningMap provides the map of pinning virtual CPU cores to physical CPU cores/threads.  References:  tosca-nfv-YAML-v1.0-wd05-rev02 (VirtualCpuPinning: cpu\_pinning\_map)  ETSI GS NFV-IFA 011 V2.1.3 (VirtualCpuPinningData: cpuPinningMap)  [ Is static False. Containment is Not Specified. ] |

|  |
| --- |
| cpuPinningPolicy : String Public  Multiplicity: ( [0..1], Allow duplicates: 0, Is ordered: False )  Indicates the policy for CPU pinning. The policy can take values of "static" or "dynamic".  References:  tosca-nfv-YAML-v1.0-wd05-rev02 (VirtualCpuPinning: cpu\_pinning\_policy)  ETSI GS NFV-IFA 011 V2.1.3 (VirtualCpuPinningData: cpuPinningPolicy)  [ Is static False. Containment is Not Specified. ] |

|  |
| --- |
| numVirtualCpu : int Public  Number of virtual CPUs.  References:  tosca-nfv-YAML-v1.0-wd05-rev02 (num\_virtual\_cpu)  ETSI GS NFV-IFA 011 V2.1.3  [ Is static False. Containment is Not Specified. ] |

|  |
| --- |
| vduCpuRequirements : NameValuePair Public  Multiplicity: ( [0..\*], Allow duplicates: 0, Is ordered: False )  Array of key-value pair requirements on the Compute (CPU) for the VDU.  References:  ETSI GS NFV-IFA 011 V2.1.3  [ Is static False. Containment is Not Specified. ] |

|  |
| --- |
| virtualCpuClock : Scalar-Unit-Freq Public  Multiplicity: ( [0..1], Allow duplicates: 0, Is ordered: False )  Minimum virtual CPU clock rate (e.g. in MHz).  References:  tosca-nfv-YAML-v1.0-wd05-rev02 (virtual\_cpu\_clock)  ETSI GS NFV-IFA 011 V2.1.3  [ Is static False. Containment is Not Specified. ] |

|  |
| --- |
| virtualCpuOversubscriptionPolicy : String Public  Multiplicity: ( [0..1], Allow duplicates: 0, Is ordered: False )  The CPU core oversubscription policy e.g. the relation of virtual CPU cores to physical CPU cores/threads.  References:  tosca-nfv-YAML-v1.0-wd05-rev02 (virtual\_cpu\_oversubscription\_policy)  ETSI GS NFV-IFA 011 V2.1.3  [ Is static False. Containment is Not Specified. ] |

| **ASSOCIATIONS** | |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) VirtualComputeDesc | Target: Public (Class) VirtualCPUDesc  Cardinality: [1..] |

## **VirtualComputeDesc**

*Class in package 'Resource'*

The **VirtualComputeDesc** information element supports the specification of requirements related to virtual compute resources.

References:

tosca-nfv-YAML-v1.0-wd05-rev02 (VirtualCompute) NOTE: Related to VDU

ETSI GS NFV-IFA 011 V2.1.3

VirtualComputeDesc

Version 1.0 Phase 1.0 Proposed

KS0567 created on 10/12/2017. Last modified 11/2/2017

| **ATTRIBUTES** |
| --- |
| computeRequirements : NameValuePair Public  Multiplicity: ( [0..\*], Allow duplicates: 0, Is ordered: False )  Specifies compute requirements  References:  ETSI GS NFV-IFA 011 V2.1.3  [ Is static False. Containment is Not Specified. ] |

| **ASSOCIATIONS** | |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) VirtualComputeDesc | Target: Public (Class) VirtualCPUDesc  Cardinality: [1..] |

|  |  |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) VirtualComputeDesc | Target: Public (Class) VirtualMemoryDesc  Cardinality: [1] |

|  |  |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) VirtualComputeDesc | Target: Public (Class) LogicalNodeDesc  Cardinality: [1..\*] |

|  |  |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) VirtualComputeDesc  Cardinality: [1] | Target: Public (Class) VNFCDesc (VDU) (VNFCCatalogItem) |

|  |  |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) VirtualComputeDesc | Target: Public (Class) RequestedAdditionalCapability  Cardinality: [0..\*] |

|  |  |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) VNFDesc (VNFCatalogItem) | Target: Public (Class) VirtualComputeDesc  Cardinality: [0..\*] |

## **VirtualLinkDescFlavour**

*Class in package 'Resource'*

The **VirtualLinkDescFlavour** describes additional instantiation data for a given internal VL used in a DF.

References:

tosca-nfv-YAML-v1.0-wd05-rev02 (TBD)

ETSI GS NFV-IFA 011 V2.1.3

VirtualLinkDescFlavour

Version 1.0 Phase 1.0 Proposed

am803u created on 10/20/2017. Last modified 11/1/2017

| **OUTGOING STRUCTURAL RELATIONSHIPS** |
| --- |
| Aggregation from VirtualLinkDescFlavour to VNFVirtualLinkDesc (VLD)  [ Direction is 'Source -> Destination'. ] |

| **ATTRIBUTES** |
| --- |
| bitrateRequirements : LinkBitrateRequirements Public  Multiplicity: ( [0..1], Allow duplicates: 0, Is ordered: False )  Bitrate requirements for a VL created from this VirtualLinkDescFlavour.  References:  tosca-nfv-YAML-v1.0-wd05-rev02 (TBD)  ETSI GS NFV-IFA 011 V2.1.3  [ Is static False. Containment is Not Specified. ] |

|  |
| --- |
| qos : QoS Public  Multiplicity: ( [0..1], Allow duplicates: 0, Is ordered: False )  QoS of the VL  References:  tosca-nfv-YAML-v1.0-wd05-rev02 (TBD)  ETSI GS NFV-IFA 011 V2.1.3  [ Is static False. Containment is Not Specified. ] |

| **ASSOCIATIONS** | |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) VirtualLinkDescFlavour | Target: Public (Class) VnfDeploymentFlavor (Vnfdf) |

## **VirtualMemoryDesc**

*Class in package 'Resource'*

The **VirtualMemory** information element supports the specification of requirements related to virtual memory of a virtual compute resource.

References:

tosca-nfv-YAML-v1.0-wd05-rev02

ETSI GS NFV-IFA 011 V2.1.3 (VirtualMemoryData)

VirtualMemoryDesc

Version 1.0 Phase 1.0 Proposed

am803u created on 10/30/2017. Last modified 11/3/2017

| **ATTRIBUTES** |
| --- |
| numaEnabled : boolean Public  Multiplicity: ( [0..1], Allow duplicates: 0, Is ordered: False )  It specifies the memory allocation to be cognisant of the relevant process/core allocation. The cardinality can be 0 during the allocation request, if no particular value is requested.  References:  tosca-nfv-YAML-v1.0-wd05-rev02 (numa\_enabled)  ETSI GS NFV-IFA 011 V2.1.3  [ Is static False. Containment is Not Specified. ] |

|  |
| --- |
| vduMemRequirements : NameValuePair Public  Multiplicity: ( [0..\*], Allow duplicates: 0, Is ordered: False )  Array of key-value pair requirements on the memory for the VDU  References:  ETSI GS NFV-IFA 011 V2.1.3  [ Is static False. Containment is Not Specified. ] |

|  |
| --- |
| virtualMemOversubscriptionPolicy : String Public  Multiplicity: ( [0..1], Allow duplicates: 0, Is ordered: False )  The memory core oversubscription policy in terms of virtual memory to physical memory on the platform. The cardinality can be 0 during the allocation request, if no particular value is requested.  References:  tosca-nfv-YAML-v1.0-wd05-rev02 (virtual\_mem\_oversubscription\_polity)  ETSI GS NFV-IFA 011 V2.1.3  [ Is static False. Containment is Not Specified. ] |

|  |
| --- |
| virtualMemSize : Scalar-Unit-Size Public  Amount of virtual memory  References:  tosca-nfv-YAML-v1.0-wd05-rev02 (virtual\_mem\_size)  ETSI GS NFV-IFA 011 V2.1.3  [ Is static False. Containment is Not Specified. ] |

| **ASSOCIATIONS** | |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) VirtualComputeDesc | Target: Public (Class) VirtualMemoryDesc  Cardinality: [1] |

## **VirtualStorageDesc**

*Class in package 'Resource'*

The **VirtualStorageDesc** information element supports the specifications of requirements related to virtual storage resources.

References:

tosca-nfv-YAML-v1.0-wd05-rev02 (VDU.VirtualStorage)

ETSI GS NFV-IFA 011 V2.1.3

VirtualStorageDesc

Version 1.0 Phase 1.0 Proposed

KS0567 created on 10/12/2017. Last modified 11/1/2017

| **ATTRIBUTES** |
| --- |
| rdmaEnabled : boolean Public  Multiplicity: ( [0..1], Allow duplicates: 0, Is ordered: False )  Indicate if the storage support RDMA.  References:  tosca-nfv-YAML-v1.0-wd05-rev02  ETSI GS NFV-IFA 011 V2.1.3  [ Is static False. Containment is Not Specified. ] |

|  |
| --- |
| sizeOfStorage : Scalar-Unit-Size Public  Size of virtualised storage resource (e.g. size of volume, in GB).  References:  tosca-nfv-YAML-v1.0-wd05-rev02  ETSI GS NFV-IFA 011 V2.1.3  [ Is static False. Containment is Not Specified. ] |

|  |
| --- |
| typeOfStorage : String Public  Type of virtualised storage resource (e.g. volume, object).  References:  tosca-nfv-YAML-v1.0-wd05-rev02  ETSI GS NFV-IFA 011 V2.1.3  [ Is static False. Containment is Not Specified. ] |

|  |
| --- |
| vduStorageRequirements : NameValuePair Public  Multiplicity: ( [0..\*], Allow duplicates: 0, Is ordered: False )  An array of key-value pairs that articulate the storage deployment requirements.  References:  ETSI GS NFV-IFA 011 V2.1.3  (Note: not in tosca-nfv-YAML-v1.0-wd05-rev02)  [ Is static False. Containment is Not Specified. ] |

| **ASSOCIATIONS** | |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) VirtualStorageDesc  Cardinality: [0..\*] | Target: Public (Class) VNFCDesc (VDU) (VNFCCatalogItem) |

|  |  |
| --- | --- |
| Association (direction: Unspecified)  SwLoadedOnStorage | |
| Source: Public (Class) VirtualStorageDesc  Cardinality: [1..] | Target: Public (Class) SwImageDesc  Cardinality: [0..1] |

|  |  |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) VNFDesc (VNFCatalogItem) | Target: Public (Class) VirtualStorageDesc  Cardinality: [0..\*] |

## **VnfDeploymentFlavor (Vnfdf)**

*Class in package 'Resource'*

The **VnfDeploymentFlavor** (Vnfdf) information element describes specific deployment flavor(s) of a VNF with specific requirements for capacity and performance.

References:

ETSI GS NFV-IFA 011 V2.1.3

VnfDeploymentFlavor (Vnfdf)

Version 1.0 Phase 1.0 Proposed

KS0567 created on 10/12/2017. Last modified 11/1/2017

| **ASSOCIATIONS** | |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) VnfDeploymentFlavor (Vnfdf)  Cardinality: [0..\*] | Target: Public (Class) VNFCDesc (VDU) (VNFCCatalogItem) |

|  |  |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) VDUProfile  Cardinality: [0..1] | Target: Public (Class) VnfDeploymentFlavor (Vnfdf)  Cardinality: [1] |

|  |  |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) VirtualLinkDescFlavour | Target: Public (Class) VnfDeploymentFlavor (Vnfdf) |

|  |  |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) VNFDesc (VNFCatalogItem) | Target: Public (Class) VnfDeploymentFlavor (Vnfdf)  Cardinality: [1..\*] |

## **VnfElementGroup**

*Class in package 'Resource'*

VnfElementGroup

Version 1.0 Phase 1.0 Proposed

KS0567 created on 10/19/2017. Last modified 10/19/2017

| **ASSOCIATIONS** | |
| --- | --- |
| Association (direction: Unspecified)  Same Thing???? | |
| Source: Public (Class) VFModule | Target: Public (Class) VnfElementGroup |

|  |  |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) VNFDesc (VNFCatalogItem) | Target: Public (Class) VnfElementGroup |

## **VnfExtCPDesc**

*Class in package 'Resource'*

A **VnfExtCpDesc** is a type of Cpd and describes an external interface, a.k.a external CP, exposed by this VNF enabling connection with a VL. A VnfExtCpDesc inherits from the VNFCCPDesc Class). All attributes of the VNFCCPDesc are also attributes of the VnfExtCpDesc .

When the VnfExtCpDesc is mapped to a VNFCCPDesc, the values for the attributes type, subType and description shall be identical for both elements.

References:

tosca-nfv-YAML-v1.0-wd05-rev02 (identified but not defined)

ETSI GS NFV-IFA 011 V2.1.3 (VnfExtCpd)

VnfExtCPDesc

Version 1.0 Phase 1.0 Proposed

ks0567 created on 10/18/2017. Last modified 11/1/2017

Extends VNFCCPDesc (VNFC Connection Point Desc) (VDUCPD)

| **OUTGOING STRUCTURAL RELATIONSHIPS** |
| --- |
| Generalization from VnfExtCPDesc to VNFCCPDesc (VNFC Connection Point Desc) (VDUCPD)  [ Direction is 'Source -> Destination'. ] |

| **ATTRIBUTES** |
| --- |
| virtualNetworkInterfaceRequirements : NameValuePair Public  Specifies requirements on a virtual network interface realising the CPs instantiated from this CPD  References:  ETSI GS NFV-IFA 011 V2.1.3  [ Is static False. Containment is Not Specified. ] |

| **ASSOCIATIONS** | |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) VnfExtCPDesc | Target: Public (Class) VnfIntCPDesc  Cardinality: [0..1] |

|  |  |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) VnfExtCPDesc | Target: Public (Class) VNFVirtualLinkDesc (VLD)  Cardinality: [0..1] |

|  |  |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) VNFDesc (VNFCatalogItem) | Target: Public (Class) VnfExtCPDesc  Cardinality: [1..\*] |

## **VnfIntCPDesc**

*Class in package 'Resource'*

The **VnfIntCPDesc** reference to the internal VDU CPD which is used to instantiate internal CPs. These internal CPs are, in turn, exposed as external CPs defined by this external CPD. Either intVirtualLinkDesc or intCpd shall be

present.

References:

ETSI GS NFV-IFA 011 V2.1.3

VnfIntCPDesc

Version 1.0 Phase 1.0 Proposed

ks0567 created on 10/18/2017. Last modified 11/1/2017

Extends VNFCCPDesc (VNFC Connection Point Desc) (VDUCPD)

| **OUTGOING STRUCTURAL RELATIONSHIPS** |
| --- |
| Generalization from VnfIntCPDesc to VNFCCPDesc (VNFC Connection Point Desc) (VDUCPD)  [ Direction is 'Source -> Destination'. ] |

| **ASSOCIATIONS** | |
| --- | --- |
| Association (direction: Unspecified)  InternalVLD | |
| Source: Public (Class) VnfIntCPDesc  Cardinality: [\*] | Target: Public (Class) VNFVirtualLinkDesc (VLD)  Cardinality: [0..1] |

|  |  |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) VnfExtCPDesc | Target: Public (Class) VnfIntCPDesc  Cardinality: [0..1] |

## **VnfcConfigurableProperties (or SID Characteristic Pattern)**

*Class in package 'Resource'*

VnfcConfigurableProperties (or SID Characteristic Pattern)

Version 1.0 Phase 1.0 Proposed

KS0567 created on 10/19/2017. Last modified 10/19/2017

| **ASSOCIATIONS** | |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) VnfcConfigurableProperties (or SID Characteristic Pattern) | Target: Public (Class) VNFDesc (VNFCatalogItem) |

|  |  |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) VnfcConfigurableProperties (or SID Characteristic Pattern) | Target: Public (Class) VNFCDesc (VDU) (VNFCCatalogItem) |

## **VnfdElementGroup**

*Class in package 'Resource'*

VnfdElementGroup

Version 1.0 Phase 1.0 Proposed

am803u created on 11/1/2017. Last modified 11/1/2017

| **ATTRIBUTES** |
| --- |
| description : String Public  Human readable description of the group  References:  ETSI GS NFV-IFA 011 V2.1.3  [ Is static False. Containment is Not Specified. ] |

| **ASSOCIATIONS** | |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) VnfdElementGroup | Target: Public (Class) VNFCDesc (VDU) (VNFCCatalogItem)  Cardinality: [0..\*] |

|  |  |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) VnfdElementGroup | Target: Public (Class) VNFVirtualLinkDesc (VLD)  Cardinality: [0..\*] |

|  |  |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) ScalingAspect | Target: Public (Class) VnfdElementGroup  Cardinality: [0..1] |

|  |  |
| --- | --- |
| Association (direction: Unspecified) | |
| Source: Public (Class) VNFDesc (VNFCatalogItem) | Target: Public (Class) VnfdElementGroup  Cardinality: [0..\*] |