Mapping IM (clean version) to SOL001 (data model).

This page shows the current agreement on the design time information model of resources for ONAP R2.

NOTE: Differences with ETSI IFA011 v2.3.2 (draft) are marked in orange.

The "SOL001 Mapping" column shows the mapping of each Attribute to SOL001 specification (TOSCA model). This mapping is based on SOL001 v0.5.0 + all of approved contribution from SOL WG#55. This table is work in progress.

Class: VNFD/VNFDesc

Attribute Name	Type	Multiplicity	Description	Applied Stereotypes	SOL001 Mapping
vnfdId	Identifier	1	Identifier of this VNFD information element. This attribute shall be globally unique. NOTE: The VNFD Identifier shall be used as the unique identifier of the VNF Package that contains this VNFD. Any modification of the content of the VNFD or the VNF Package shall result in a new VNFD Identifier.	support: MANDATORY	tosca.nodes.nfv.VNF as properties
vnfProvider	String	1	Provider of the VNF and of the VNFD.	support: MANDATORY	tosca.nodes.nfv.VNF as properties
vnfProductName	String	1	Name to identify the VNF Product. Invariant for the VNF Product lifetime.	support: MANDATORY	tosca.nodes.nfv.VNF as properties
vnfSoftwareVersion	String	1	Software version of the VNF. This is changed when there is any change to the software that is included in the VNF Package.	support: MANDATORY	SOL001: tosca.nodes.nfv.VNF as properties Modeled as “string”
vnfdVersion	String	1	Identifies the version of the VNFD.	support: MANDATORY	tosca.nodes.nfv.VNF as properties Modeled as “string”
vnfProductInfoName	String	0..1	Human readable name for the VNF Product. Can change during the VNF Product lifetime.	support: MANDATORY	tosca.nodes.nfv.VNF as properties
vnfProductInfoDescription	String	0..1	Human readable description of the VNF Product. Can change during the VNF Product lifetime.	support: MANDATORY	tosca.nodes.nfv.VNF as properties
vnfmInfo	String	0..N	Identifies VNFM(s) compatible with the VNF described in this version of the VNFD.	support: MANDATORY valueRange: use the name of micro-service of the vnfm drive. For vendor specific VNFM, the value composes of "vendorname" and "vnfmdriver", e.g. "mycompanyvnfmdriver"; for generic VNFM, the value is "gvnfmdriver".	tosca.nodes.nfv.VNF as properties

localizationLanguage	String	0..N	Information about localization languages of the VNF (includes e.g. strings in the VNFD). NOTE: This allows to provide one or more localization languages to support selecting a specific localization language at VNF instantiation time.	support: MANDATORY valueRange: refer to ISO936 https://www.iso.org/iso-639-language-codes.html	tosca.nodes.nfv.VNF as properties Modeled as “string”
defaultLocalizationLanguage	String	0..1	Default localization language that is instantiated if no information about selected localization language is available.	support: MANDATORY valueRange: refer to ISO936 https://www.iso.org/iso-639-language-codes.html condition: Shall be present if "localizationLanguage" is present and shall be absent otherwise.	tosca.nodes.nfv.VNF as properties Modeled as “string”
vdu	VDU/VDUDesc	1..N	Virtualisation Deployment Unit.	support: MANDATORY	tosca.nodes.VDU.Compute
virtualComputeDesc	VirtualComputeDesc	1..N	Defines descriptors of virtual compute resources to be used by the VNF.	support: MANDATORY	tosca.nodes.VDU.Compute tosca.capabilities.nfv.VirtualCompute
virtualStorageDesc	VirtualStorageDesc	0..N	Defines descriptors of virtual storage resources to be used by the VNF.	support: MANDATORY	tosca.nodes.nfv.VDU.VirtualStorage
intVirtualLinkDesc	VirtualLinkDesc/VnfVirtualLinkDesc	0..N	Represents the type of network connectivity mandated by the VNF provider between two or more CPs which includes at least one internal CP.	support: MANDATORY	tosca.nodes.nfv.VnfVirtualLinkDesc
vnfReservedCpd	VduCpd	0..N	Reserved IP Address for VNF which is not bounded to any specific VNFC, but assigned manually from outside and potentially shared as a floating IP among VNFCs.	support: MANDATORY	N/A in SOL001
vnfExtCpd	VnfExtCpd/VNFExtCPDesc	1..N	Describes external interface(s) exposed by this VNF enabling connection with a VL.	support: MANDATORY	tosca.nodes.nfv.VnfExtCpd
deploymentFlavour	VnfDf/VNFDeploymentFlavor	1..N	Describes specific DF(s) of a VNF with specific requirements for capacity and performance.	support: MANDATORY	TBD
configurableProperties	VnfConfigurableProperties	0..1	Describes the configurable properties of the VNF (e.g. related to auto scaling and auto healing).	support: MANDATORY	tosca.datatypes.nfv.VnfConfigurableProperties
modifiableAttributes	VnfInfoModifiableAttributes	0..1	Describes the modifiable attributes of the VNF. Editor's note: need check the usage of this attribute	support: MANDATORY	tosca.datatypes.nfv.VnfInfoModifiableAttributes
lifeCycleManagementScript	LifeCycleManagementScript/ LifeCycleManagementOperationDesc	0..N	Includes a list of events and corresponding management scripts performed for the VNF.	support: MANDATORY	tosca.interfaces.nfv.vnf.lifecycle.Nfv
elementGroup	VnfdElementGroup	0..N	Describes the associated elements of a VNFD for a certain purpose during VNF lifecycle management.	support: MANDATORY	tosca.groups.nfv.ElementGroup
vnfIndicator	VnfIndicator	0..N	Declares the VNF indicators that are supported by this VNF.	support: MANDATORY	TBD

logo	String	0..1	File path of the vendor specified logo.	support: MANDATORY	N/A in SOL001
guide	String	0..1	UUID of the vendor guide/documentation which is attached to VNF and can be downloaded from the model.	support: MANDATORY	N/A in SOL001

Class: VDU/VDUDesc

Attribute Name	Type	Multiplicity	Description	Applied Stereotypes	SOL001 Mapping
vduId	Identifier	1	Unique identifier of this Vdu in VNFD.	support: MANDATORY	not required
name	String	1	Human readable name of the Vdu.	support: MANDATORY	tosca.nodes.VDU.Compute
description	String	1	Human readable description of the Vdu.	support: MANDATORY	tosca.nodes.VDU.Compute
vduCpd	VduCpd/VDUCPDesc	1..N	Describes network connectivity between a VNFC instance (based on this Vdu) and an Virtual Link (VL).	support: MANDATORY	tosca.nodes.nfv.VduCpd tosca.nodes.nfv.Cpd
virtualComputeDesc	Identifier (reference to VirtualComputeDesc)	1	Describes CPU, Memory and acceleration requirements of the Virtualisation Container realising this Vdu.	support: MANDATORY	tosca.capabilities.nfv.VirtualCompute
virtualStorageDesc	Identifier (reference to VirtualStorageDesc)	0..N	Describes storage requirements for a VirtualStorage instance attached to the virtualisation container created from virtualComputeDesc defined for this Vdu.	support: MANDATORY	tosca.capabilities.nfv.VirtualStorage
bootOrder	KeyValuePair/NameValuePair	0..N	Boot order of valid boot devices. NOTE: If no boot order is defined the default boot order defined in the VIM or NFVI shall be used.	support: MANDATORY valueRange: "key/name" indicates the the boot index (lowest index defines highest boot priority). "value" references a descriptor from which a valid boot device is created e.g. VirtualStorageDesc from which a VirtualStorage instance is created.	tosca.nodes.VDU.Compute
swImageDesc	SwImageDesc	0..1 Editor's note: the scenario of using "0" needs to be clarified.	Describes the software image which is directly loaded on the virtualisation container realising this Vdu. NOTE: More software images can be attached to the virtualisation container using VirtualStorage resources.	support: MANDATORY	tosca.artifacts.nfv.SwImage
nfviConstraint	KeyValuePair/NameValuePair	0..N	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. NOTE: These are constraints other than stipulating that a VNFC instance has access to a certain resource, as a prerequisite to instantiation. The attributes virtualComputeDesc and virtualStorageDesc define the resources required for instantiation of the VNFC instance.	support: MANDATORY valueRange: "key/name" includes "AvailabilityZone", "HostAggregates".	tosca.nodes.VDU.Compute
monitoringParameter	MonitoringParameter	0..N	Defines the virtualised resources monitoring parameters on VDU level.	support: MANDATORY	tosca.capabilities.nfv.Metric

configurable Properties	VnfcConfigurableProperties	1	Describes the configurable properties of all VNFC instances based on this VDU.	support: MANDATORY	tosca.nodes.VDU.Compute: as properties: tosca.datatypes.nfv.VnfcConfigurableProperties
injectFiles	String	0..N	Describes the information (e.g. URL) about the scripts, config drive metadata, etc. which can be used during Vdu booting process.	support: MANDATORY	N/A in SOL001

Class: SwImageDesc

Attribute Name	Type	Multiplicity	Description	Applied Stereotypes	SOL001 Mapping
id	Identifier	1	The identifier of this software image.	support: MANDATORY	Not required
name	String	1	The name of this software image.	support: MANDATORY	tosca.artifacts.nfv.SwImage as properties
version	String	1	The version of this software image.	support: MANDATORY	tosca.artifacts.nfv.SwImage as properties
checksum	String	1	The checksum of the software image file.	support: MANDATORY	tosca.artifacts.nfv.SwImage as properties
containerFormat	String	1	The container format describes the container file format in which software image is provided.	support: MANDATORY	tosca.artifacts.nfv.SwImage as properties
diskFormat	String	1	The disk format of a software image is the format of the underlying disk image.	support: MANDATORY	tosca.artifacts.nfv.SwImage as properties
minDisk	Number (recommended DM type: Scalar-Unit-Size)	1	The minimal disk size requirement for this software image. The value of the "size of storage" attribute of the VirtualStorageDesc referencing this SwImageDesc shall not be smaller than the value of minDisk.	support: MANDATORY	tosca.artifacts.nfv.SwImage as properties
minRam	Number (recommended DM type: Scalar-Unit-Size)	0..1	The minimal RAM requirement for this software image. The value of the "size" attribute of VirtualMemoryData of the Vdu referencing this SwImageDesc shall not be smaller than the value of minRam.	support: MANDATORY	tosca.artifacts.nfv.SwImage as properties
size	Number (recommended DM type: Scalar-Unit-Size)	1	The size of this software image.	support: MANDATORY	tosca.artifacts.nfv.SwImage as properties

swImage	Identifier (Reference to a SwImage)	1	This is a reference to the actual software image. The reference can be relative to the root of the VNF Package or can be a URL.	support: MANDATORY	tosca.artifacts.nfv.SwImage as properties
operatingSystem	String	0..1	Identifies the operating system used in the software image. This attribute may also identify if a 32 bit or 64 bit software image is used.	support: MANDATORY	tosca.artifacts.nfv.SwImage as properties
supportedVirtualisationEnvironment	String	0..N	Identifies the virtualisation environments (e.g. hypervisor) compatible with this software image.	support: MANDATORY	tosca.artifacts.nfv.SwImage as properties

Class: VirtualComputeDesc

Attribute Name	Type	Multiplicity	Description	Applied Stereotypes	SOL001 Mapping
virtualComputeDescId	Identifier	1	Unique identifier of this VirtualComputeDesc in the VNFD.	support: MANDATORY	Not required
logicalNode	LogicalNodeData/LogicialNodeDesc	1..N	The logical Node requirements.	support: MANDATORY	tosca.capabilities.nfv.VirtualCompute as properties tosca.datatypes.nfv.LogicalNodeData
requestAdditionalCapabilities	RequestedAdditionalCapabilityData	0..N	Specifies requirements for additional capabilities. These may be for a range of purposes. One example is acceleration related capabilities.	support: MANDATORY	tosca.capabilities.nfv.VirtualCompute as properties tosca.datatypes.nfv.RequestedAdditionalCapability
computeRequirements	KeyValuePair/NameValuePair	0..N	Specifies compute requirements.	support: MANDATORY	tosca.capabilities.nfv.VirtualCompute as properties
virtualMemory	VirtualMemoryData/VirtualMemoryDesc	1	The virtual memory of the virtualised compute.	support: MANDATORY	tosca.capabilities.nfv.VirtualCompute as properties tosca.datatypes.nfv.VirtualMemory
virtualCpu	VirtualCpuData/VirtualCPUDesc	1	The virtual CPU(s) of the virtualised compute.	support: MANDATORY	tosca.capabilities.nfv.VirtualCompute as properties tosca.datatypes.nfv.VirtualCpu

Class: VirtualCpuData/VirtualCPUDesc

Attribute Name	Type	Multiplicity	Description	Applied Stereotypes	SOL001 Mapping
cpuArchitecture	String	0..1	CPU architecture type. Examples are x86, ARM. The cardinality can be 0 during the allocation request, if no particular CPU architecture type is requested.	support: MANDATORY	tosca.capabilities.nfv.VirtualCompute as properties tosca.datatypes.nfv.VirtualCpu

numVirtualCpu	Integer	1	Number of virtual CPUs.	support: MANDATORY	tosca.capabilities.nfv.VirtualCompute as properties tosca.datatypes.nfv.VirtualCpu
virtualCpuClock	Number (recommended DM type: Scalar-Unit-Freq)	0..1	Minimum virtual CPU clock rate (e.g. in MHz). The cardinality can be 0 during the allocation request, if no particular value is requested.	support: MANDATORY	tosca.capabilities.nfv.VirtualCompute as properties tosca.datatypes.nfv.VirtualCpu
virtualCpuOversubscriptionPolicy	String	0..1	The CPU core oversubscription policy e.g. the relation of virtual CPU cores to physical CPU cores/threads. The cardinality can be 0 during the allocation request, if no particular value is requested.	support: MANDATORY	tosca.capabilities.nfv.VirtualCompute as properties tosca.datatypes.nfv.VirtualCpu
vduCpuRequirements	KeyValuePair /NameValuePair	0..N	Array of key-value pair requirements on the Compute (CPU) for the VDU.	support: MANDATORY	tosca.capabilities.nfv.VirtualCompute as properties tosca.datatypes.nfv.VirtualCpu
virtualCpuPinning	VirtualCpuPinningData	0..1	The virtual CPU pinning configuration for the virtualised compute resource.	support: MANDATORY editor's note: need to check whether can be optional	tosca.capabilities.nfv.VirtualCompute as properties tosca.datatypes.nfv.VirtualCpu

Class: VirtualMemoryData/VirtualMemoryDesc

Attribute Name	Type	Multiplicity	Description	Applied Stereotypes	SOL001 Mapping
virtualMemSize	Number (recommended DM type: Scalar-Unit-Size)	1	Amount of virtual Memory (e.g. in MB).	support: MANDATORY	tosca.capabilities.nfv.VirtualCompute as properties tosca.datatypes.nfv.VirtualMemory
virtualMemOversubscriptionPolicy	String	0..1	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.	support: MANDATORY	tosca.capabilities.nfv.VirtualCompute as properties tosca.datatypes.nfv.VirtualMemory

vduMemRequirements	KeyValuePair /NameValuePair	0..N	Array of key-value pair requirements on the memory for the VDU.	support: MANDATORY	tosca.capabilities.nfv.VirtualCompute as properties tosca.datatypes.nfv.VirtualMemory
numaEnabled	Boolean	0..1	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.	support: MANDATORY	tosca.capabilities.nfv.VirtualCompute as properties tosca.datatypes.nfv.VirtualMemory

Class: VirtualStorageDesc

Attribute Name	Type	Multiplicity	Description	Applied Stereotypes	SOL001 Mapping
id	Identifier	1	Unique identifier of this VirtualStorageDesc in the VNFD.	support: MANDATORY	tosca.nodes.nfv.VDU.VirtualStorage as properties
typeOfStorage	String	1	Type of virtualised storage resource (e.g. volume, object).	support: MANDATORY	tosca.nodes.nfv.VDU.VirtualStorage as properties
sizeOfStorage	Number (recommended DM type: Scalar-Unit-Size)	1	Size of virtualised storage resource (e.g. size of volume, in GB).	support: MANDATORY	tosca.nodes.nfv.VDU.VirtualStorage as properties
vduStorageRequirements	KeyValuePair/NameValuePair	0..N	An array of key-value pairs that articulate the storage deployment requirements.	support: MANDATORY	tosca.nodes.nfv.VDU.VirtualStorage as properties
rdmaEnabled	Boolean	0..1	Indicate if the storage support RDMA.	support: MANDATORY	tosca.nodes.nfv.VDU.VirtualStorage as properties
swImageDesc	Identifier (Reference to SwImageDesc)	0..1	Software image to be loaded on the VirtualStorage resource created based on this VirtualStorageDesc.	support: MANDATORY	tosca.artifacts.Deployment.Image

Class: LogicalNodeData/LogicalNodeDesc

Attribute Name	Type	Multiplicity	Description	Applied Stereotypes	SOL001 Mapping
logicalNodeRequirements	KeyValuePair /NameValuePair	0..N	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.	support: MANDATORY	tosca.datatypes.nfv.LogicalNodeData

Class: Cpd/CPDesc

Attribute Name	Type	Multiplicity	Description	Applied Stereotypes	SOL001 Mapping
cpdId	Identifier	1	Identifier of this Cpd information element.	support: MANDATORY	Not required
cpRole	String	0..1	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.	support: MANDATORY	tosca.nodes.nfv.Cpd as Properties
description	String	0..1	Provides human-readable information on the purpose of the CP (e.g. CP for control plane traffic).	support: MANDATORY	tosca.nodes.nfv.Cpd as Properties
cpProtocol	CpProtocolData	1..N	Identifies the protocol layering information the CP uses for connectivity purposes and associated information. There shall be one cpProtocol for each layer protocol as indicated by the attribute layerProtocol. Editor's note: the attribute "layerProtocol" still needs further discussion and not included in this table.	support: MANDATORY	tosca.nodes.nfv.Cpd as Properties
trunkMode	Boolean	1	Information about whether the CP instantiated from this CPD is in Trunk mode (802.1Q or other).	support: MANDATORY	tosca.nodes.nfv.Cpd as Properties
allowedAddressData	AddressData	0..N	For specifying floating IP(s) to be shared among Cpds, which are reserved for vnfReservedCpd described in the VNFD.	support: MANDATORY	N/A in SOL001

Class: VduCpd/VDUCPDesc

Attribute Name	Type	Multiplicity	Description	Applied Stereotypes	SOL001 Mapping
bitrateRequirement	Number (recommended DM type: Scalar-Unit-Rate)	0..1	Bitrate requirement on this CP.	support: MANDATORY	tosca.nodes.nfv.VduCpd as properties
vnicName	String	0..1	Describes the name of the vNIC this CP attaches to, e.g. eth0. It will be configured during the Vdu booting process.	support: MANDATORY	N/A in SOL001
vnicOrder	Integer	0..1	Describes the order to create the vNIC within the scope of this Vdu.	support: MANDATORY	N/A in SOL001
vnicType	Enum	0..1	Describes the type of the vNIC this CP attaches to.	support: MANDATORY valueRange: normal, macvtap, direct, baremetal, direct-physical and virtio-forwarder	N/A in SOL001
virtualNetworkInterfaceRequirements	VirtualNetworkInterfaceRequirements	0..N	Specifies requirements on a virtual network interface realising the CPs instantiated from this CPD.	support: MANDATORY	tosca.nodes.nfv.VduCpd as properties tosca.datatypes.nfv.VirtualNetworkInterfaceRequirements
(inherited attributes)			All attributes inherited from Cpd.		

Class: VduProfile

Attribute Name	Type	Multiplicity	Description	Applied Stereotypes	SOL001 Mapping
vduId	Identifier (Reference to Vdu)	1	Uniquely identifies a VDU.	support: MANDATORY	
minNumberOfInstances	Integer	1	Minimum number of instances of the VNFC based on this VDU that is permitted to exist for this flavour.	support: MANDATORY	tosca.datatypes.nfv.VduProfile as properties

maxNumberOfInstances	Integer	1	Maximum number of instances of the VNFC based on this VDU that is permitted to exist for this flavour.	support: MANDATORY	tosca.datatypes.nfv.VduProfile as properties
localAffinityOrAntiAffinityRule	LocalAffinityOrAntiAffinityRule	0..N	Specifies affinity or anti-affinity rules applicable between the virtualisation containers (e.g. virtual machines) to be created based on this VDU. When the cardinality is greater than 1, both affinity rule(s) and anti-affinity rule(s) with different scopes (e.g. "Affinity with the scope resource zone and anti-affinity with the scope NFVI node") are applicable to the virtualisation containers (e.g. virtual machines) to be created based on this VDU.	support: MANDATORY	modeled as policy types
affinityOrAntiAffinityGroupId	Identifier	0..N	Identifier(s) of the affinity or anti-affinity group(s) the VDU belongs to. NOTE: Each identifier references an affinity or anti-affinity group which expresses affinity or anti-affinity relationships between the virtualisation container(s) (e.g. virtual machine(s)) to be created using this VDU and the virtualisation container(s) (e.g. virtual machine(s)) to be created using other VDU(s) in the same group.	support: MANDATORY	modeled as policy types
watchdog	String	0..1	Watchdog action to be triggered by the VIM for the VNF in case the heart beat fails, e.g. reset or hard shutdown, etc.	support: MANDATORY	N/A in SOL001
vmBootUpTimeOut	Integer	0..1	Timeout value for the VNFM to wait before the successful booting up of the VDU.	support: OPTIONAL	N/A in SOL001

Class: VirtualNetworkInterfaceRequirements

Attribute Name	Type	Multiplicity	Description	Applied Stereotypes	SOL001 Mapping
name	String	0..1	Provides a human readable name for the requirement.	support: MANDATORY	tosca.datatypes.nfv.VirtualNetworkInterfaceRequirements as properties
description	String	0..1	Provides a human readable description of the requirement.	support: MANDATORY	tosca.datatypes.nfv.VirtualNetworkInterfaceRequirements as properties
supportMandatory	Boolean	1	Indicates whether fulfilling the constraint is mandatory (TRUE) for successful operation or desirable (FALSE).	support: MANDATORY	tosca.datatypes.nfv.VirtualNetworkInterfaceRequirements as properties
networkInterfaceRequirements	KeyValuePair/NameValuePair	0..N	The network interface requirements. An element from an array of key-value pairs that articulate the network interface deployment requirements.	support: MANDATORY	tosca.datatypes.nfv.VirtualNetworkInterfaceRequirements as properties