



## ETSI MANO Northbound API Overview

The ETSI MANO API is another programmatic interface to ESC that uses the REST architecture. The ETSI MANO adheres to the standards defined by the European Telecommunications Standards Institute (ETSI), specifically around Management and Orchestration (MANO). The API accepts and returns HTTP messages that contain JavaScript Object Notation (JSON). The API contains its own datamodel designed around the ETSI MANO specifications (*ETSI GS NFV-SOL 003 V2.3.1*) that abstract away from the ESC core datamodel.

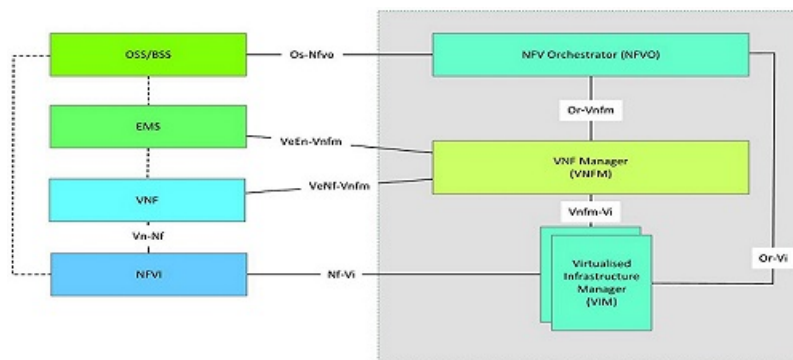
The initial implementation of ETSI standard supports ETSI MANO API over Or-Vnfm reference point, which is the interface between ESC and NFV MANO. The Or-Vnfm reference point details the interactions to onboard ETSI compliant VNF packages, manage resources, and VNF lifecycle management (LCM) operations.



**Note** The terminology used in the ETSI-specific sections of the user guide align to the ETSI MANO standards defined in the ETSI documentation. For more information, see the [ETSI website](#).

For more information on Or-Vnfm reference point, see the *ETSI Group Specification document* on the ETSI website. The figure below represents the NFV MANO architecture with the Or-Vnfm reference point.

**Figure 1: NFV MANO Architecture with Reference Points**



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## Resource Definitions for ETSI API

Cisco Elastic Services Controller (ESC) resources comprises of images, flavours, tenants, volumes, networks, and subnetworks. These resources are the ones that ESC requests to provision a Virtual Network Function.

For ETSI MANO, these resource definitions are created by NFVO either at the time of onboarding the VNF package or onboarding the tenant, and represented by the VIM identifiers in the request to ESC.

For information on managing resources using NETCONF or REST APIs, see [Managing Resources Overview](#).

To access ETSI MANO API documentation directly from the ESC VM, see [ETSI MANO Northbound API](#).

The following table lists the resource definitions on the VIM that must be made available before VNF instantiation.



**Note** Virtual Network Function lifecycle operations using ETSI MANO API is supported on OpenStack only.

**Table 1: Resource Definitions on VIM**

Resource Definitions	OpenStack
Tenants	Out of band tenants  You can create a tenant using NETCONF API, REST API, or the ESC portal. You can also create a tenant directly on the VIM. The tenant is then referred to as the resourceGroupId.
Images	Out of band images  The NFVO onboards a VNF package and then onboards the image contained within the VNF package on to the VIM. This can then be referenced in the sw_image attribute.
Flavours	Out of band flavours  During onboarding of the VNF Package, the NFVO looks at the toasca.nodes.nfv.VDU.Compute node in the VNFD to determine the flavour to be created. This is available later at the time of instantiation.  <b>Note</b> ETSI deployment flavour is a different concept than OpenStack compute flavor. For more information, see <a href="#">Terms and Conditions</a> .
Volumes	Out of band volumes  The out of band volume requirements are detailed in the toasca.nodes.nfv.VDU.Compute node in the VNFD.
External Networks (Virtual Link)	Out of band networks
Externally Managed Internal Virtual Links	The externally managed internal virtual links are defined in the VNFD, or referred to if the resource is out of band.
Subnetworks	Out of band subnets

For information on onboarding VNF packages and lifecycle operations using the ETSI MANO API, see VNF Lifecycle Operations Using ETSI API.

