
Fuel NSXv plugin documentation

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Mirantis Inc.

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Fuel NSXv plugin allows you to deploy OpenStack cluster which can use pre-existing vSphere infrastructure with NSX network virtualization platform.

Plugin installs Neutron NSX core plugin and allows logical network equipment (routers, networks) to be created as NSX entities.

Plugin version 1.x.x series is compatible with Fuel 7.0.

Plugin can work with VMware NSX 6.1.3, 6.1.4.

Through documentation we use term “NSX” and “NSXv” interchangeably, both of these term refer to [VMware NSX virtualized network platform](#).

DOCUMENTATION CONTENTS

1.1 Installation

Pre-built package of the plugin you can find in [Fuel Plugin Catalog](#).

1. Download plugin .rpm package.
2. Upload package to Fuel master node.
3. Install the plugin with *fuel* command line tool:

```
[root@nailgun ~] fuel plugins --install nsxv-1.0-1.0.0-1.noarch.rpm
```

Installation process may take up to 1-2 minutes depending on hardware specification of your Fuel Master node, because plugin has to update database and restart docker containers.

4. Verify that the plugin is installed successfully:

```
[root@nailgun ~] fuel plugins
id | name | version | package_version
---|-----|-----|-----
1  | nsxv | 1.0.0   | 3.0.0
```

After installation plugin can be used for new OpenStack clusters, it is not possible to enable plugin on deployed clusters.

If you update Fuel Master node by applying maintenance updates, you need to reinstall the plugin:

```
[root@nailgun ~] fuel plugins --force --install nsxv-1.0-1.0.0-1.noarch.rpm
```

1.1.1 Uninstallation

Before uninstalling plugin be sure that there no environments left that use the plugin, otherwise it is not possible to uninstall it.

During installation plugin changes Fuels database content. It removes restriction that forbids configuring vCenter with Neutron. After plugin gets uninstalled it is possible to configure inoperable configuration of cluster. To prevent this situation execute *restore_db.py* script that comes with plugin. This action is not done automatically on plugin uninstallation, because there are might be another plugin that also rely on absence of restriction. Script must be execute before plugin uninstallation, otherwise it will be delete.

```
[root@nailgun ~] python /var/www/nailgun/plugins/nsxv-1.1/restore_db.py
[root@nailgun ~] fuel plugins --remove nsxv==1.0.0
```

1.2 OpenStack environment notes

1.2.1 Environment creation

Before start actual deployment process please verify that you vSphere infrastructure (vCenter and NSXv) is configured and functions properly, Fuel NSXv plugin cannot deploy vSphere infrastructure, it must be up and running before OpenStack deployment.

To use NSXv plugin create new OpenStack environment via the Fuel web UI follow these steps:

1. On *Compute* configuration step tick 'vCenter' checkbox

Create a new OpenStack environment

Name and Release

- KVM
Choose this type of hypervisor if you run OpenStack on hardware
- QEMU
Choose this type of hypervisor if you run OpenStack on virtual hosts
- vCenter
Choose this option if you have a vCenter environment with ESXi servers to be used as hypervisors

Compute

Networking Setup

Storage Backends

Additional Services

Finish

Cancel Prev Next

2. After plugin gets installed it updates Fuel and it will be possible to use *Neutron with tunneling segmentation* at 'Networking Setup' step:

Create a new OpenStack environment

Name and Release

Compute

Networking Setup

Storage Backends

Additional Services

Finish

Neutron is not available with vCenter as a selected compute option.

Choose the private (guest) network configuration. The choice you make here cannot be changed after you finish the wizard. More information see the [Mirantis OpenStack Planning Guide for Network Topology](#)

- Neutron with VLAN segmentation
The networking equipment must be configured for VLAN segmentation. This option supports up to 4095 networks.
- Neutron with tunneling segmentation
By default VXLAN tunnels will be used (can be changed to GRE via Fuel CLI). The networking equipment must support VXLAN segmentation. This option supports millions of tenant data networks.
- (DEPRECATED) Legacy Networking (nova-network)
This option is only available if you use VMware vCenter. Note that OpenStack is moving to deprecate nova-network in upcoming releases.

Cancel Prev Next

Warning: After Fuel database gets updated it is possible to enable Murano support for cloud with NSX, but Murano functionality was not tested with NSX.

3. Once you get environment created add one or more controller node.

Pay attention on which interface you assign *Public* network, Controller must have connectivity with NSX Manager host through *Public* network since it is used as default route for packets.

It is worth to mention that it is not possible to use compute nodes in this type of cluster, because NSX switch is not available for Linux only for ESXi, so it is not possible to pass traffic inside compute node that runs Linux and KVM. Also it does not matter on which network interface you assign 'VM fixed' traffic, because it does not flow through controllers.

Floating IP ranges are not used, because Neutron L3 agent is not used on Controller.

	Start	End
Floating IP ranges	<input type="text" value="172.16.0.130"/>	<input type="text" value="172.16.0.254"/>

Pay attention that Neutron L2/L3 configuration on Settings tab does not have effect in OpenStack cluster that uses NSXv. These settings contain settings for GRE tunneling which does not have an effect with NSXv.

Neutron L2 Configuration

Tunnel ID range	<input type="text" value="2"/>	<input type="text" value="65535"/>
Base MAC address	<input type="text" value="fa:16:3e:00:00:00"/>	

Neutron L3 Configuration

Internal network CIDR	<input type="text" value="192.168.111.0/24"/>	
Internal network gateway	<input type="text" value="192.168.111.1"/>	
Guest OS DNS Servers	<input type="text" value="8.8.4.4"/>	<input type="button" value="+"/> <input type="button" value="-"/>
	<input type="text" value="8.8.8.8"/>	<input type="button" value="+"/> <input type="button" value="-"/>

1.2.2 Environment reset/deletion

Each time OpenStack environment gets reset or deleted Edge VMs that were created by that environment will remain in vSphere infrastructure. It is up to user to remove VMs that were left after environment reset/deletion.

1.3 Configuration

Switch to Settings tab of the Fuel web UI and click on NSXv plugin section, tick the plugin checkbox to enable it.

NSXv plugin

NSX Manager hostname (or IP)

NSX Manager user

NSX Manager password

Datacenter MoRef ID Datacenter MoRef ID for Edge deployment, e.g. datacenter-126

Cluster MoRef IDs for OpenStack VMs Comma separated cluster MoRef IDs for OpenStack VMs, e.g. domain-c133,domain-c134

Resource pool MoRef ID Resource pool MoRef ID for NSX Edge nodes deployment

Datastore MoRef ID Datastore MoRef ID for NSX Edge nodes deployment

External portgroup MoRef ID External portgroup MoRef ID for NSX Edge physical connectivity

Transport zone MoRef ID Transport zone MoRef ID for VXLAN networks

Distributed virtual switch MoRef ID DVS MoRef ID connected to Edge cluster

NSX backup Edge pool Define backup edge pools management range with the four-tuple: <edge_type>[<edge_size>]<minimum_pooled_edges>:<maximum_pooled_edges>

Enable HA for NSX Edges
Deploy NSX Edges in HA pair

Do not verify NSX Manager certificate
If enabled, the NSX Manager certificate will be verified

Several plugins input fields refer to MoRef ID (Managed Object Reference ID), these are object IDs can be obtained via Managed Object Browser which is located on the vCenter host, e.g. <https://hostname.yourdomain.org/mob>

Plugin contains the following settings:

1. NSX Manager hostname (or IP) – if you are going to use hostname in this textbox be sure that your OpenStack controller will be able to resolve it. Add necessary DNS servers in *Host OS DNS Servers* section. NSX Manager must be connected to vCenter server which you specified on VMware tab.
OpenStack Controller must have L3 connectivity with NSX Manager through Public network.
2. NSX Manager user and password for access.
3. Datacenter MoRef ID – ID of Datacenter where NSX Edge nodes will be deployed.
4. Cluster MoRef IDs for OpenStack VMs – list of comma separated IDs of cluster where OpenStack VM instances will be launched. You must obtain IDs for clusters that you specified on VMware tab.
5. Resource pool MoRef ID – resource pool for NSX Edge nodes deployment.
6. Datastore MoRef ID – datastore for NSX Edge nodes.
7. External portgroup – portgroup through which NSX Edge nodes get connectivity with physical network
8. Transport zone MoRef ID – transport zone for VXLAN logical networks.

Note: This ID can be fetched using NSX Manager API <https://nsx-manager.yourdomain.org/api/2.0/vdn/scopes>

9. Distributed virtual switch MoRef ID – ID of vswitch connected to Edge cluster
10. NSX backup Edge pool – size of NSX Edge nodes and size of Edge pool, value must follow format: <edge_type>:[<edge_size>]<min_edges>:<max_edges>.

edge_type can take the following values: *service* or *vdr* (service and distributed edge, respectively).

NSX *service* nodes provide such services as DHCP, DNS, firewall, NAT, VPN, routing and load balancing.

NSX *vdr* nodes performs distributed routing and bridging.

edge_size can take following values: *compact*, *large* (default value if omitted), *xlarge*, *quadlarge*.

min_edges and **max_edges** defines minimum and maximum amount of NSX Edge nodes in pool.

Consider following table that describes NSX Edge types:

Edge size	Edge VM parameters
compact	1 vCPU 512 MB vRAM
large	2 vCPU 2014 MB vRAM
xlarge	4 vCPU 1024 MB vRAM
quadlarge	6 vCPU 8192 MB vRAM

Consider following example values:

```
service:compact:1:2,vdr:compact:1:3
```

```
service:xlarge:2:6,service:large:4:10,vdr:large:2:4
```

11. Enable HA for NSX Edges – if you enable this option NSX Edges will be deployed in active/standby pair on different ESXi hosts.
12. Bypass NSX Manager certificate verification – disable this option if you want Neutron NSX plugin to verify NSX Manager security certificate. *CA certificate file* setting will appear providing an option to upload CA certificate which emitted NSX Manager certificate.

To enable Nova metadata service, set the following settings must be set:

1. Metadata portgroup MoRef ID – portgroup MoRef ID for metadata proxy service
2. Metadata proxy IP addresses – comma separated IP addresses used by Nova metadata proxy service.
3. Management network netmask – management network netmask for metadata proxy service.
4. Management network default gateway – management network gateway for metadata proxy service.

If you tick *Additional settings* checkbox following options will become available for configuration:

1. Task status check interval – asynchronous task status check interval, default is 2000 (millisecond).
2. Maximum tunnels per vnic – specify maximum amount of tunnels per vnic, possible range of values 1-110 (20 is used if no other value is provided).
3. API retries – maximum number of API retries (10 by default)
4. Enable SpoofGuard – option allows to control behaviour of port-security feature that prevents traffic flow if IP address of VM that was reported by VMware Tools does not match source IP address that is observed in outgoing VM traffic (consider the case when VM was compromised).
5. Tenant router types – ordered list of preferred tenant router types (default value is 'shared, distributed, exclusive').

1.4 Usage

1.4.1 VXLAN MTU considerations

The VXLAN protocol is used for L2 logical switching across ESXi hosts. VXLAN adds additional data to the packet, please consider to increase MTU size on network equipment that is connected to ESXi hosts.

Consider following calculation when settings MTU size:

Outer IPv4 header == 20 bytes

Outer UDP header == 8 bytes

VXLAN header == 8 bytes

Inner Ethernet frame == 1518 (14 bytes header, 4 bytes 802.1q header, 1500 Payload)

Summarizing all of these we get 1554 bytes. Consider increasing MTU on network hardware up to 1600 bytes (default MTU value when you are configuring VXLAN on ESXi hosts during *Host Preparation* step).

1.4.2 Instances usage notes

Instances that you run in OpenStack cluster with vCenter and NSXv must have VMware Tools installed, otherwise there will be no connectivity and security groups functionality.

1.4.3 Neutron usage notes

The only way to create Distributed Router is to use neutron CLI tool:

```
$ neutron router-create dvr --distributed True
```

Creation of exclusive tenant router is not supported in OpenStack dashboard (Horizon). You can create exclusive router using Neutron CLI tool:

```
$ neutron router-create DbTierRouter-exclusive --router_type exclusive
```

During creation of external network for tenants you must specify physical network (`--provider:physical_network` parameter) that will be used to carry VM traffic into physical network segment. For Neutron with NSX plugin this parameter must be set to MoRef ID of portgroup which provides connectivity to NSX Edge nodes.

```
$ neutron net-create External --router:external --provider:physical_network network-222
```

1.5 Known issues

Plugin does not support node names that use non ASCII characters. Possible solution for this problem would be to rename nodes using only ASCII characters. This can be done by switching to Nodes tab and clicking on node names (by default the look like 'Untitled (a1:b8)').

See <https://bugs.launchpad.net/fuel/+bug/1519916>.