



# Deploy the Management Center Virtual Using OpenStack

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You can deploy the management center virtual on OpenStack.

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## Overview

This guide describes how to deploy the management center virtual in an OpenStack environment. OpenStack is a free open standard cloud computing platform, mostly deployed as infrastructure-as-a-service (IaaS) in both public and private clouds where virtual servers and other resources are made available to users.

The management center virtual runs the same software as physical management center to deliver proven security functionality in a virtual form factor. The management center virtual can be deployed on OpenStack. It can then be configured to manage virtual and physical devices.

This deployment uses a KVM hypervisor to manage virtual resources. KVM is a full virtualization solution for Linux on x86 hardware containing virtualization extensions (such as Intel VT). It consists of a loadable kernel module, `kvm.ko`, that provides the core virtualization infrastructure and a processor specific module, such as `kvm-intel.ko`. You can run multiple virtual machines running unmodified OS images using KVM. Each virtual machine has private virtualized hardware: a network card, disk, graphics adapter, and so forth.

Because the devices are already supported on the KVM hypervisor, no additional kernel packages or drivers are needed to enable OpenStack support.

## Prerequisites

- Download the management center virtual `qcow2` file from [software.cisco.com](https://software.cisco.com) and put it on your Linux host:

<https://software.cisco.com/download/navigator.html>

- A [software.cisco.com](https://www.software.cisco.com) and Cisco service contract are required.
- The management center virtual supports deployment on opensource OpenStack environment and Cisco VIM managed OpenStack environment.

Set up the OpenStack environment according to the OpenStack guidelines.

- See the opensource OpenStack document:
  - Stein Release - <https://docs.openstack.org/project-deploy-guide/openstack-ansible/stein/overview.html>
  - Queens Release - <https://docs.openstack.org/project-deploy-guide/openstack-ansible/queens/overview.html>
- See the Cisco Virtualized Infrastructure Manager (VIM) OpenStack document: [Cisco Virtualized Infrastructure Manager Documentation, 3.4.3 to 3.4.5](#)
- Licensing:
  - You configure license entitlements for the security services from the management center.
  - See “Licensing the System” in the *Firepower Management Center Configuration Guide* for more information about how to manage licenses.
- Memory and resource requirements:
  - Processors
    - Requires 16 vCPUs
  - Memory
    - Minimum required 28 GB / Recommended (default) 32 GB RAM
  - Host storage per Virtual Machine
    - The management center virtual requires 250 GB




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**Note** You can modify the vCPU and memory values as per your requirement.

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- Interface requirements:
  - Management interface — One used to connect the device to the management center.
- Communications paths:
  - Floating IPs for access into the management center virtual.
- Minimum supported management center virtual version:
  - Version 7.0.
- For OpenStack requirements, see [System Requirements, on page 3](#).
- For management center virtual and System compatibility, see [Cisco Firepower Compatibility](#).

# Guidelines and Limitations

## Supported Features

The management center virtual on OpenStack supports the following features:

- Deployment the management center virtual on the KVM hypervisor running on a compute node in your OpenStack environment.
- OpenStack CLI
- Heat template-based deployment
- Licensing — Only BYOL is supported
- Drivers - VIRTIO, VPP, and SRIOV
- IPv6 is supported

## Unsupported Features

The management center virtual on OpenStack does not support the following:

- Autoscale
- OpenStack releases other than the OpenStack Stein and Queens releases
- Operating systems other than the Ubuntu 18.04 version and Red Hat Enterprise Linux (RHEL) 7.6

# System Requirements

The OpenStack environment must conform to the following supported hardware and software requirements.

**Table 1: Hardware and Software Requirements**

Category	Supported Versions	Notes
Server	UCS C240 M5	2 UCS servers are recommended, one each for os-controller and os-compute nodes.
Driver	VIRTIO, IXGBE, I40E	These are the supported drivers.
Operating System	Ubuntu Server 18.04	This is the recommended OS on UCS servers.
OpenStack Version	Stein release	Details of the various OpenStack releases are available at: <a href="https://releases.openstack.org/">https://releases.openstack.org/</a>

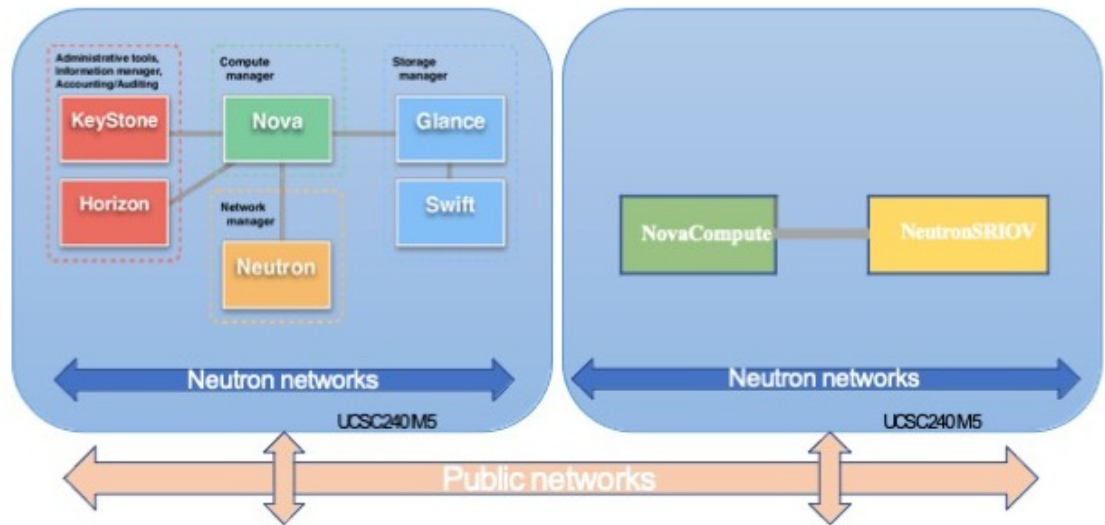
**Table 2: Hardware and Software Requirements for Cisco VIM Managed OpenStack**

Category	Supported Versions	Notes
Server Hardware	UCS C220-M5/UCS C240-M4	5 UCS servers are recommended, three each for os-controller and Two or more for os-compute nodes.
Drivers	VIRTIO, SRIOV, and VPP	These are the supported drivers.
Cisco VIM Version	Cisco VIM 3.4.4 Supported on: <ul style="list-style-type: none"> <li>• Operating System - Red Hat Enterprise Linux 7.6</li> <li>• OpenStack version - OpenStack 13.0 (Queens Release)</li> </ul>	See <a href="#">Cisco Virtualized Infrastructure Manager Documentation, 3.4.3 to 3.4.5</a> for more information.  Details of the various OpenStack releases are available at <a href="https://releases.openstack.org/">https://releases.openstack.org/</a> .
	Cisco VIM 4.2.1 Supported on: <ul style="list-style-type: none"> <li>• Operating System - Red Hat Enterprise Linux 8.2</li> <li>• OpenStack version - OpenStack 16.1 (Train Release)</li> </ul>	See <a href="#">Cisco Virtualized Infrastructure Manager Documentation, 4.2.1</a> for more information.  Details of the various OpenStack releases are available at <a href="https://releases.openstack.org/">https://releases.openstack.org/</a> .

### OpenStack Platform Topology

The following figure shows the recommended topology to support deployments in OpenStack using two UCS servers.

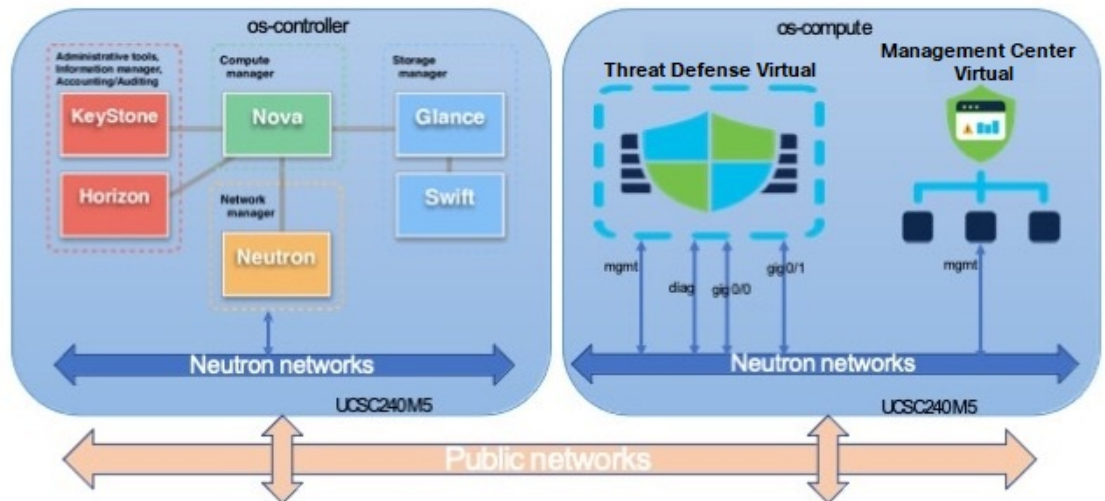
Figure 1: OpenStack Platform Topology



## Sample Network Topology

The following figure shows a network topology example for the management center virtual in OpenStack.

Figure 2: Topology Example with the Management Center Virtual on OpenStack



## Deploy the Management Center Virtual

Cisco provides sample heat templates for deploying the management center virtual. Steps for creating the OpenStack infrastructure resources are combined in a heat template (`deploy_os_infra.yaml`) file to

create networks, subnets, and router interfaces. At a high-level, the management center virtual deployment steps are categorized into the following sections.

- Upload the management center virtual qcow2 image to the OpenStack Glance service.
- Create the network infrastructure.
  - Network
  - Subnet
  - Router interface
- Create the management center virtual instance.
  - Flavor
  - Security Groups
  - Floating IP
  - Instance

You can deploy the management center virtual on OpenStack using the following steps.

## Upload the Management Center Virtual Image to OpenStack

Copy the management center virtual qcow2 image to the OpenStack controller node, and then upload the image to the OpenStack Glance service.

### Before you begin

- Download the management center virtual qcow2 file from Cisco.com and put it on your Linux host:  
<https://software.cisco.com/download/navigator.html>

**Step 1** Copy the qcow2 image file to the OpenStack controller node.

**Step 2** Upload the management center virtual image to the OpenStack Glance service.

```
root@ucs-os-controller:~$ openstack image create <fmcv_image> --public --disk-format qcow2 --container-format bare --file ./<fmcv_qcow2_file>
```

**Step 3** Verify if the management center virtual image upload is successful.

```
root@ucs-os-controller:~$ openstack image list
```

### Example:

```
root@ucs-os-controller:~$ openstack image list
list+-----+-----+-----+
| ID                               | Name                | Status  |
|-----+-----+-----+
| b957b5f9-ed1b-4975-b226-4cddf5887991 | fmcv-7-0-image     | active  |
|-----+-----+-----+
```

The uploaded image and its status is displayed.

**What to do next**

Create the network infrastructure using the `deploy_os_infra.yaml` template.

## Create the Network Infrastructure for the OpenStack and the Management Center Virtual

Deploy the OpenStack infrastructure heat template to create the network infrastructure.

**Before you begin**

Heat template files are required to create the network infrastructure and the required components for the management center virtual, such as flavor, networks, subnets, router interfaces, and security group rules:

- `env.yaml` — Defines the resources created to support the management center virtual on the compute node, such as the image name, interfaces, and IP addresses.
- `deploy_os_infra.yaml` — Defines the environment for the management center virtual, such as the network and subnets.

Templates for your management center virtual version are available from the GitHub repository at [FMCv OpenStack heat template](#).




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**Important** Note that Cisco-provided templates are provided as open source examples, and are not covered within the regular Cisco TAC support scope. Check GitHub regularly for updates and ReadMe instructions.

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**Step 1** Deploy the infrastructure heat template file.

```
root@ucs-os-controller:~$ openstack stack create <stack-name> -e <environment files name> -t <deployment file name>
```

**Example:**

```
root@ucs-os-controller:~$ openstack stack create infra-stack -e env.yaml -t deploy_os_infra.yaml
```

**Step 2** Verify if the infrastructure stack is created successfully.

```
root@ucs-os-controller:~$ openstackstack list
```

**Example:**

```
root@ucs-os-controller:~$ openstack stack list
```

```

+-----+-----+-----+-----+-----+-----+
--+
| ID | Stack Name | Project | Stack Status | Creation Time | Updated Time |
+-----+-----+-----+-----+-----+-----+
--+
| b30d5875-ce3a-4258-a841-bf2d09275929 | infra-stack | 13206e49b48740fdafca83796c6f4ad5 |
CREATE_COMPLETE | 2020-12-07T15:10:24Z | None |
+-----+-----+-----+-----+-----+
--+
```

**What to do next**

Create the management center virtual instance on OpenStack.

## Create the Management Center Virtual Instance on OpenStack

Use the sample heat template to deploy the management center virtual on OpenStack.

**Before you begin**

A heat template is required to deploy the management center virtual on OpenStack:

- `deploy_fmcv.yaml`

Templates for your management center virtual version are available from the GitHub repository at [FMCv OpenStack heat template](#).




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**Step 1** Deploy the management center virtual heat template file (`deploy_fmcv.yaml`) to create the management center virtual instance.

```
root@ucs-os-controller:~$ openstack stack create fmcv-stack -e env.yaml -t deploy_fmcv.yaml
```

**Example:**

```
+-----+
| Field          | Value                                     |
+-----+-----+
| id             | 96c8c126-107b-4733-8f6c-eb15a637219f    |
| stack_name     | fmcv-stack                               |
| description    | FMCv template                           |
| creation_time  | 2020-12-07T14:55:05Z                    |
| updated_time   | None                                     |
| stack_status   | CREATE_IN_PROGRESS                       |
| stack_status_reason | Stack CREATE started                     |
+-----+-----+
```

**Step 2** Verify that your management center virtual stack is created successfully.

```
root@ucs-os-controller:~$ openstack stack list
```

**Example:**

```
+-----+-----+-----+-----+-----+-----+
| ID                               | Stack Name | Project                               | Stack Status |
| Creation Time | Updated Time |
+-----+-----+-----+-----+-----+-----+
| 14624af1-e5fa-4096-bd86-c453bc2928ae | fmcv-stack | 13206e49b48740fdafca83796c6f4ad5 | CREATE_COMPLETE |
| 198336cb-1186-45ab-858f-15ccd3b909c8 | infra-stack | 13206e49b48740fdafca83796c6f4ad5 | CREATE_COMPLETE |
+-----+-----+-----+-----+-----+-----+
```