



# Deploy the ASA Virtual on OpenStack

You can deploy the ASA virtual on OpenStack.

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## Overview

You can deploy the ASA virtual in an OpenStack environment. OpenStack is a set of software tools for building and managing cloud computing platforms for public and private clouds, and is tightly integrated with the KVM hypervisor.

Enabling OpenStack platform support for ASA virtual allows you to run ASA virtual on open source cloud platforms. OpenStack uses a KVM hypervisor to manage virtual resources. ASA virtual devices are already supported on KVM hypervisor. Therefore, there is no extra addition of kernel packages or drivers to enable OpenStack support.

## Prerequisites for the ASA Virtual and OpenStack

- Download the ASA virtual qcow2 file from [software.cisco.com](http://software.cisco.com) and put it on your Linux host:  
<http://www.cisco.com/go/asa-software>
- ASA 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](#)
- License the ASA virtual. Until you license the ASA virtual, it will run in degraded mode, which allows only 100 connections and throughput of 100 Kbps. See [Licenses: Smart Software Licensing](#).
- Interface requirements:
  - Management interface
  - Inside and outside interfaces
- Communications paths:
  - Management interface—Used to connect the ASA virtual to the ASDM; can't be used for traffic.
  - Inside interface (required)—Used to connect the ASA virtual to inside hosts.
  - Outside interface (required)—Used to connect the ASA virtual to the public network.
- Communications paths:
  - Floating IPs for access into the ASA virtual.
- Minimum supported ASA virtual version:
  - ASA 9.16.1
- For OpenStack requirements, see [System Requirements](#).
- For ASA virtual system requirements, see [Cisco Secure Firewall ASA Compatibility](#).

## Guidelines and Limitations

### Supported Features

The ASA virtual on OpenStack supports the following features:

- Deployment of ASA virtual on the KVM hypervisor running on a compute node in your OpenStack environment.
- OpenStack CLI
- Heat template-based deployment
- OpenStack Horizon dashboard
- Routed mode (default)
- Licensing – Only BYOL is supported
- ASA virtual management using the CLI and ASDM
- Drivers - VIRTIO, VPP, and SRIOV
- IPv6 (version 9.19 and later)

### Unsupported Features

The ASA 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:<br><a href="https://releases.openstack.org/">https://releases.openstack.org/</a> |

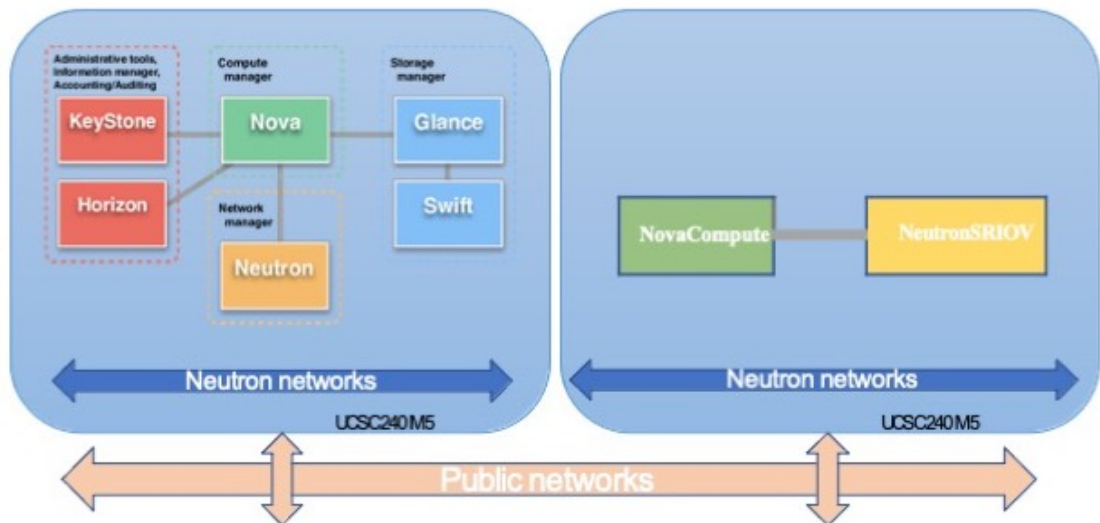
**Table 2: Hardware and Software Requirements for Cisco VIM Managed OpenStack**

| 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.  |

| Category          | Supported Versions  | Notes  |
|-------------------|---|--|
| Cisco VIM Version | Cisco VIM 3.4.4<br>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.<br><br>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<br>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.<br><br>Details of the various OpenStack releases are available at <a href="https://releases.openstack.org/">https://releases.openstack.org/</a> .          |

**Figure 1: OpenStack Platform Topology**

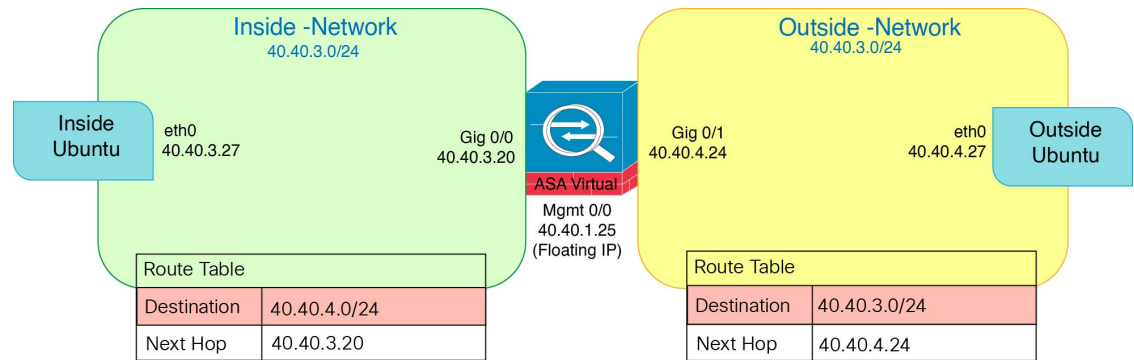
OpenStack platform topology shows the general OpenStack setup on two UCS servers.



## Sample Network Topology

The following figure shows the recommended network topology for the ASA virtual in Routed Firewall Mode with 3 subnets configured in OpenStack for the ASA virtual (management, inside, and outside).

Figure 2: Sample ASA Virtual on OpenStack Deployment



## Deploy the ASA Virtual

Cisco provides sample heat templates for deploying the ASA 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 ASA virtual deployment steps are categorized into the following sections.

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

You can deploy the ASA virtual on OpenStack using the following steps.

## Upload the ASA Virtual Image to OpenStack

Copy the qcow2 image (`asav-<version>.qcow2`) to the OpenStack controller node, and then upload the image to the OpenStack Glance service.

### Before you begin

Download the ASA virtual qcow2 file from Cisco.com and put it on your Linux host:

<http://www.cisco.com/go/asa-software>




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**Note** A Cisco.com login and Cisco service contract are required.

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

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

```
root@ucs-os-controller:$ openstack image create <image_name> --public --disk-
format qcow2 --container-format bare --file ./<asav_qcow2_file>
```

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

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

**Example:**

```
root@ucs-os-controller:$ openstack image
list+-----+-----+-----+
| ID                               | Name                               | Status |
+-----+-----+-----+
| 06dd7975-0b6e-45b8-810a-4ff98546a39d | asav-<version>-image | active |
+-----+-----+-----+
```

The uploaded image and its status is displayed.

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**What to do next**

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

## Create the Network Infrastructure for OpenStack and ASA Virtual

**Before you begin**

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

- `deploy_os_infra.yaml`
- `env.yaml`

Templates for your ASA virtual version are available from the GitHub repository at:

- <https://github.com/CiscoDevNet/cisco-asav>




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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:$ openstack stack list
```

**What to do next**

Create the ASA virtual instance on OpenStack.

## Create the ASA Virtual Instance on OpenStack

Use the sample ASA virtual heat template to deploy ASA virtual on OpenStack.

**Before you begin**

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

- `deploy_asav.yaml`

Templates for your ASA virtual version are available from the GitHub repository at:

- <https://github.com/CiscoDevNet/cisco-asav>



**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.

**Step 1** Deploy the ASA virtual heat template file (`deploy_asav.yaml`) to create the ASA virtual instance.

```
root@ucs-os-controller:$ openstack stack create asav-stack -e env.yaml -t deploy_asav.yaml
```

**Example:**

```
+-----+-----+
| Field          | Value                                     |
+-----+-----+
| id             | 14624af1-e5fa-4096-bd86-c453bc2928ae |
| stack_name     | asav-stack                             |
| description    | ASAvtemplate                           |
| 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 ASA virtual stack is created successfully.

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

**Example:**

| ID                                   | Creation Time        | Updated Time | Stack Name  | Project                          | Stack Status    |
|--------------------------------------|----------------------|--------------|-------------|----------------------------------|-----------------|
| 14624af1-e5fa-4096-bd86-c453bc2928ae | 2020-12-07T14:55:05Z |              | asav-stack  | 13206e49b48740fdafca83796c6f4ad5 | CREATE_COMPLETE |
| 198336cb-1186-45ab-858f-15ccd3b909c8 | 2020-12-03T10:46:50Z |              | infra-stack | 13206e49b48740fdafca83796c6f4ad5 | CREATE_COMPLETE |