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# Minimum nodes = 5

## Install OpenStack in LXC on CentOS 7

### Base

```
yum install centos-release-openstack-newton
yum upgrade
yum install python-openstackclient memcached
```

### Dashboard

```
yum install openstack-dashboard
```

/etc/openstack-dashboard/local\_settings

```
ALLOWED_HOSTS = ['*']
```

```
systemctl restart httpd.service memcached.service
```

**URL: /openstack-horizon/**

sunbeam dashboard-url

sunbeam openrc

```
sudo socat -v tcp-listen:80,fork tcp:10.20.21.12:80
```

### Keystone Identity Manager

```
yum install openstack-keystone python-keystoneclient
```

## Install OpenStack on UBUNTU

[Openstack Autopilot](#)

```
sudo apt install keystone
enable_provider = fernet in /etc/keystone/keystone.conf
su -s /bin/sh -c "keystone-manage db_sync" keystone
keystone-manage fernet_setup --keystone-user keystone --keystone-group keystone
keystone-manage credential_setup --keystone-user keystone --keystone-group keystone
keystone-manage bootstrap --bootstrap-password ADMIN_PASS --bootstrap-admin-url
http://controller:35357/v3/ --bootstrap-internal-url http://controller:5000/v3/ --bootstrap-
public-url http://controller:5000/v3/ --bootstrap-region-id RegionOne
```

## Install OpenStack All-in-one-Machine

[Install on single machine VirtualBOX Image for testing](#)

## Openstack Blocks

### Dashboard - Horizon

Web front end to the other OpenStack services

### Object Store - Swift

Swift is conceptually similar to [Amazon S3](#)

### Image catalog and repository - Glance

Image (Glance) can store the actual virtual disk files in the Object Store(Swift)  
Glance provides many of the same features as [Amazon's AMI catalog](#)

### Compute - Nova

Create or destroy XEN, KVM, VMware, LXC, OpenVZ machines  
Nova is conceptually similar to [Amazon EC2](#)

### Identity - Keystone

Keystone is an OpenStack service that provides API client authentication, service discovery.

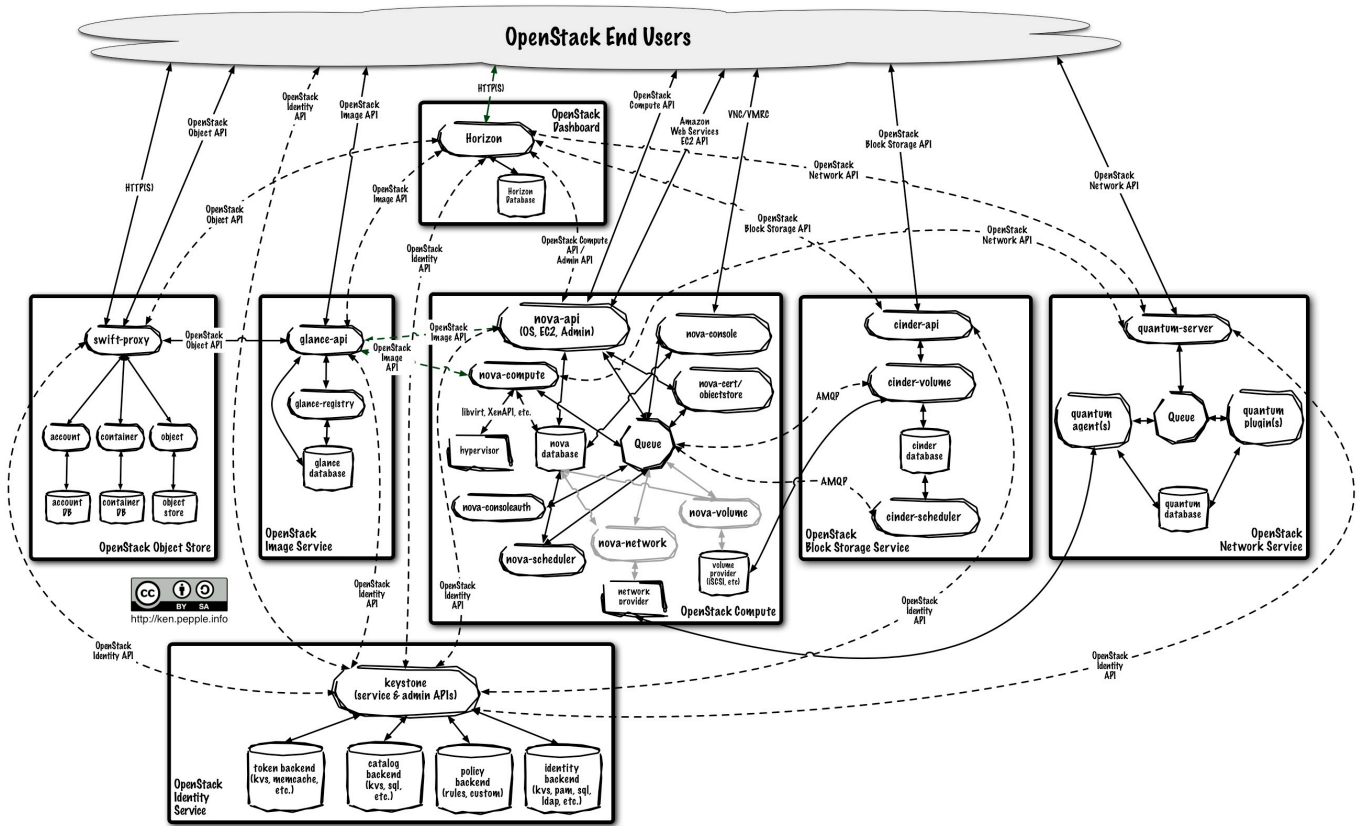
### Network - Quantum

Provides virtual networking for Compute

### Block Storage - Cinder

Provides storage volumes for Compute  
Cinder provides block services similar to [Amazon Elastic Block Storage](#)

## Openstack Architecture



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