

## Install

Install OpenStack

```
sudo snap install microstack --beta --devmode  
sudo microstack init --auto --control
```

Install OpenStack client

```
sudo snap install openstackclients
```

## Interact

Obtain *admin* user password

```
sudo snap get microstack config.credentials.keystone-  
password
```

OpenStack dashboard URL

```
https://10.20.20.1
```

Source downloaded RC file

```
source <file path>
```

List OpenStack services

```
openstack catalog list
```

## Domains

List domains

```
openstack domain list
```

Show domain details

```
openstack domain show <domain ID>
```

Create domain

```
openstack domain create <domain name>
```

Update domain

```
openstack domain set <key> <value> <domain ID>
```

Delete domain

```
openstack domain delete <domain ID>
```

## Users

List users

```
openstack user list
```

Show user details

```
openstack user show <user ID>
```

Create user

```
openstack user create --password <password> <user name>
```

Update user

```
openstack user set <key> <value> <user ID>
```

Set user password

```
openstack user password set
```

Delete user

```
openstack user delete <user ID>
```

## Groups

List groups

```
openstack group list
```

Show group details

```
openstack group show <group ID>
```

Create group

```
openstack group create <group name>
```

Update group

```
openstack group set <key> <value> <group ID>
```

Add user to group

```
openstack group add user <group ID> <user ID>
```

Remove user from

```
openstack group remove user <group ID> <user ID>
```

Delete group

```
openstack group delete <group ID>
```

## Projects

List projects

```
openstack project list
```

Show project details

```
openstack project show <project ID>
```

Create project

```
openstack project create <project name>
```

Update project

```
openstack project set <key> <value> <project ID>
```

Delete project

```
openstack project delete <project ID>
```

## Roles

Assign role on project

```
openstack role add --project <project ID> [--user <user  
ID> | --group <group ID>] <role name>
```

Remove role on project

```
openstack role remove --project <project ID> [--user  
<user ID> | --group <group ID>] <role name>
```

## Images

List images

```
openstack image list
```

Show image details

```
openstack image show <image ID>
```

Create image

```
openstack image create --disk-format qcow2 --file <file  
path> <image name>
```

Update image

```
openstack image set <key> <value> <image ID>
```

Delete image

```
openstack image delete <image ID>
```

## Flavors

List flavors

```
openstack flavor list
```

Show flavor details

```
openstack flavor show <flavor name>
```

Create flavor

```
openstack flavor create --vcpus <vCPUs> --ram <RAM [MB]>
--disk <Disk [GB]> <flavor name>
```

Update flavor

```
openstack flavor set <key> <value> <flavor name>
```

Delete flavor

```
openstack flavor delete <flavor name>
```

## Networks

List networks

```
openstack network list
```

Show network details

```
openstack network show <network ID>
```

Create network

```
openstack network create <network name>
```

Update network

```
openstack network set <key> <value> <network ID>
```

Delete network

```
openstack network delete <network ID>
```

## Subnets

List subnets

```
openstack subnet list
```

Show subnet details

```
openstack subnet show <subnet ID>
```

Create subnet

```
openstack subnet create --network <network ID>
--subnet-range <subnet CIDR> <subnet name>
```

Update subnet

```
openstack subnet set <key> <value> <subnet ID>
```

Delete subnet

```
openstack subnet delete <subnet ID>
```

## Routers

List routers

```
openstack router list
```

Show router details

```
openstack router show <router ID>
```

Create router

```
openstack router create <router name>
```

Update router

```
openstack router set <key> <value> <router ID>
```

Attach subnet to router

```
openstack router add subnet <router ID> <subnet ID>
```

Detach subnet from router

```
openstack router remove subnet <router ID> <subnet ID>
```

Delete router

```
openstack router delete <router ID>
```

## Security groups

List security groups

```
openstack security group list
```

Show security group details

```
openstack security group show <security group ID>
```

Create security group

```
openstack security group create <security group name>
```

Update security group

```
openstack security group set <key> <value> <security
group ID>
```

List rules in the security group

```
openstack security group rule list <security group ID>
```

Add rule to the security group

```
openstack security group rule create <key> <value> ...
<security group ID>
```

Delete rule from the security group

```
openstack security group rule delete <rule ID>
```

Delete security group

```
openstack security group delete <security group ID>
```

## Key pairs

List key pairs

```
openstack keypair list
```

Show key pair details

```
openstack keypair show <key pair name>
```

Create key pair

```
openstack keypair create --private-key <file path> <key
pair name>
```

Delete key pair

```
openstack keypair delete <key pair name>
```

## Instances

List instances

```
openstack server list
```

Show instance details

```
openstack server show <instance ID>
```

Create instance

```
openstack server create --flavor <flavor name> --image  
<image ID> --network <network ID> --key-name <key pair  
name> <instance name>
```

Update instance

```
openstack server set <key> <value> <instance ID>
```

Delete instance

```
openstack server delete <instance ID>
```

## Floating IPs

List floating IPs

```
openstack floating ip list
```

Create floating IP

```
openstack floating ip create <network ID>
```

Attach floating IP to instance

```
openstack server add floating ip <instance ID> <floating  
IP ID>
```

Detach floating IP from instance

```
openstack server remove floating ip <instance ID>  
<floating IP ID>
```

Delete floating IP

```
openstack floating ip delete <floating IP ID>
```

## Volumes

List volumes

```
openstack volume list
```

Show volume details

```
openstack volume show <volume ID>
```

Create volume

```
openstack volume create --size <size [GB]> <volume  
name>
```

Update volume

```
openstack volume set <key> <value> <volume ID>
```

Attach the volume to the instance

```
openstack server add volume <instance ID> <volume ID>
```

Detach the volume from the instance

```
openstack server remove volume <instance ID> <volume ID>
```

Delete volume

```
openstack volume delete <volume ID>
```

## Quotas

List default quotas

```
openstack quota show --default
```

Update default quotas

```
openstack quota set <key> <value> --class default
```

List project quotas

```
openstack quota show <project ID>
```

Update project quotas

```
openstack quota set <key> <value> <project ID>
```

## Teardown

Stop OpenStack

```
sudo snap stop microstack
```

Start OpenStack

```
sudo snap start microstack
```

Disable OpenStack

```
sudo snap disable microstack
```

Enable OpenStack

```
sudo snap enable microstack
```

Uninstall OpenStack

```
sudo snap remove --purge microstack
```

## OpenStack tutorials

Learn OpenStack through a series of tutorials. Starting with just your workstation, learn how to use OpenStack for cloud infrastructure implementation purposes, from a single-node installation to large-scale clusters.

Find out more at:

<https://ubuntu.com/openstack/tutorials>.