

OpenStack

Admin User Guide

havana (April 4, 2014)

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CLOUD SOFTWARE



OpenStack Admin User Guide

havana (2014-04-04)

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OpenStack is an open source cloud computing platform for public and private clouds. A series of interrelated projects deliver a cloud infrastructure solution. This guide shows OpenStack admin users how to create and manage resources in an OpenStack cloud with the OpenStack dashboard or OpenStack client commands.



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How can I administer an OpenStack cloud?

As an OpenStack cloud administrative user, you can manage tenants, known as *projects*, users, services, images, flavors, and quotas.

The examples in this guide show you how to complete these tasks with either:

- The OpenStack dashboard. Use this Web-based graphical interface, code named [horizon](#), to view, create, and manage resources and services.
- The OpenStack command-line clients. Each core OpenStack project has a command-line client that lets you run simple commands to view, create, and manage resources and services in a cloud and automate tasks by using scripts.

You can modify these examples for your specific use cases.

In addition to these ways of interacting with a cloud, you can access the OpenStack APIs directly or indirectly through [cURL](#) commands or open SDKs. You can automate access or build tools to manage resources and services by using the native OpenStack APIs or the EC2 compatibility API.

To use the OpenStack APIs, it helps to be familiar with HTTP/1.1, RESTful web services, the OpenStack services, and JSON or XML data serialization formats.

Conventions

The OpenStack documentation uses several typesetting conventions:

Admonitions

Admonitions take three forms:



Note

This is a note. The information in a note is usually in the form of a handy tip or reminder.



Important

This is important. The information in an important admonition is something you must be aware of before moving on.



Warning

This is a warning. The information in warnings is critical. Warnings provide additional information about risk of data loss or security issues.

Command prompts

Commands prefixed with the # prompt are to be executed by the `root` user. These examples can also be executed using the `sudo` command, if available.

Commands prefixed with the \$ prompt can be executed by any user, including `root`.

Document change history

This version of the guide replaces and obsoletes all previous versions. The following table describes the most recent changes:

Revision Date	Summary of Changes
January 31, 2014	<ul style="list-style-type: none">Remove the command reference appendix. This information is now in OpenStack Command Line Interface Reference.
October 17, 2013	<ul style="list-style-type: none">Havana release.
August 31, 2013	<ul style="list-style-type: none">First edition of this document.

1. Dashboard

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As a cloud administrative user, the OpenStack dashboard lets you create and manage projects, users, images, and flavors. You can also set quotas and create and manage services. For information about using the dashboard to perform end user tasks, see the [OpenStack End User Guide](#).

Log in to the dashboard

The dashboard is available on the node with the `nova-dashboard` server role.

1. Ask the cloud operator for the host name or public IP address from which you can access the dashboard, and your user name and password.
2. Open a Web browser. Make sure that JavaScript and cookies are enabled.



Note

To use the Virtual Network Computing (VNC) client for the dashboard, your browser must support HTML5 Canvas and HTML5 WebSockets. The VNC client is based on noVNC. For details, see [noVNC: HTML5 VNC Client](#). For a list of supported browsers, see [Browser support](#).

3. In the address bar, type the host name or IP address for the dashboard:

```
https://IP_ADDRESS_OR_HOSTNAME/
```



Certificate warning

If a certificate warning appears when you try to access the URL for the first time, a self-signed certificate is in use, which is not considered trustworthy by default. Verify the certificate or add an exception in the browser to bypass the warning.

4. On the **Log In** page, enter your user name and password, and click **Sign In**.

The top-level row shows your user name. You can also access **Settings** or sign out of the dashboard.

The visible tabs and functions in the dashboard depend on the access permissions, or *roles*, of the user you are logged in as.

If you are logged in as an end user, the main screen shows the [Project](#) tab.

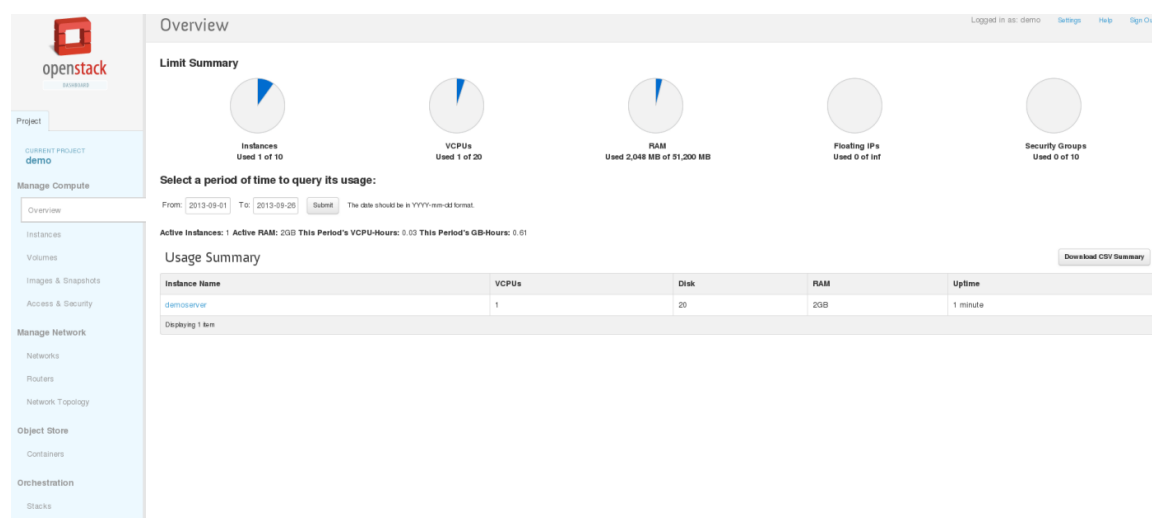
If you are logged in as an administrator, the main screen shows the [Project](#) tab and [Admin](#) tab.

OpenStack dashboard—Project tab

Select a project from the **CURRENT PROJECT** drop-down list on the left side to view and manage resources in that project.

The **Project** tab displays the details of the selected project.

Figure 1.1. Dashboard projects



Access the following tabs:

Manage Compute tab

Overview

View reports for the project.

Instances

View, launch, create a snapshot from, stop, pause, or reboot instances, or connect to them through VNC.

Volumes

View, create, edit, and delete volumes.

Images & Snapshots

View images, instance snapshots, and volume snapshots created project users, plus any images that are publicly available. Create, edit, and delete images, and launch instances from images and snapshots.

Access & Security

Use the following tabs to complete these tasks:

Security Groups tab. View, create, edit, and delete security groups and security group rules.

Keypairs tab. View, create, edit, and import keypairs, and delete keypairs.

Floating IPs tab. Allocate an IP address to or release it from a project.

API Access tab. View API endpoints.

Manage Network tab

Networks Create and manage public and private networks.

Routers Create and manage subnets.

Network Topology View the network topology.

Object Store tab

Containers Create and manage object storage.

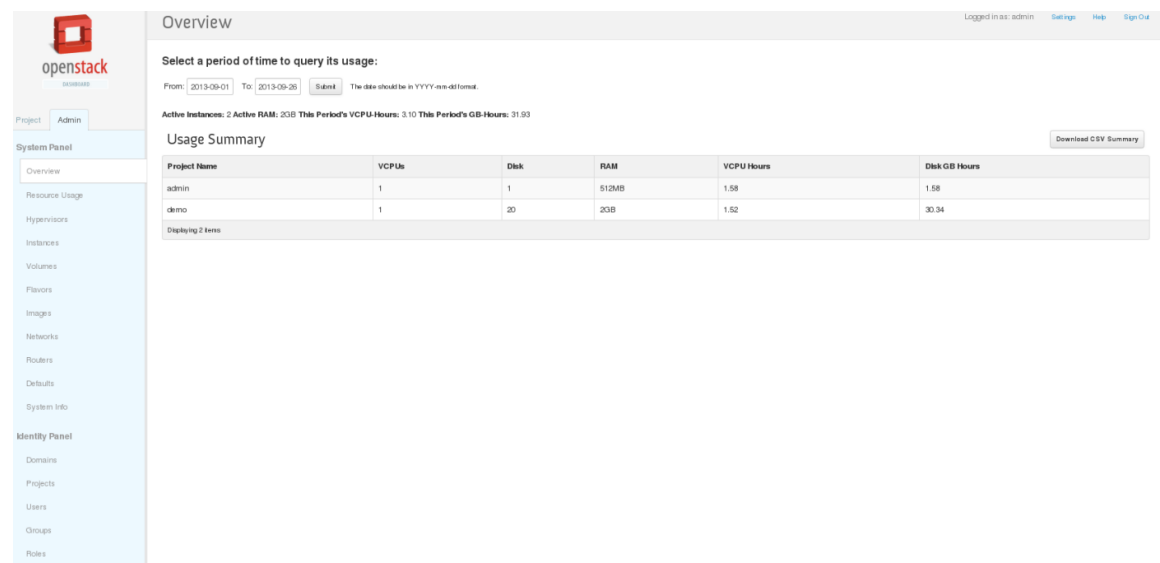
Orchestration tab

Stacks Use REST API to orchestrate multiple composite cloud applications

OpenStack dashboard—Admin tab

Enables administrative users to view usage and manage instances, volumes, flavors, images, projects, users, services, and quotas.

Figure 1.2. Admin tab



Access the following categories to complete these tasks:

Overview	View basic reports.
Resource Usage	<p>Use the following tabs to view the following usages:</p> <p>Global Disk Usage tab. View the global disk usage for all tenants as an average over the last 30 days.</p> <p>Global Network Traffic Usage tab. View the global network usage for all tenants as an average over the last 30 days.</p> <p>Global Object Storage Usage tab. View the global object storage usage for all tenants as an average over the last 30 days.</p> <p>Global Network Usage tab. View the global network usage for all tenants as an average over the last 30 days.</p> <p>Stats tab. View the statistics of all resources.</p>
Hypervisors	View the hypervisor summary.
Instances	View, pause, resume, suspend, migrate, soft or hard reboot, and delete running instances that belong to users of some, but not all, projects. Also, view the log for an instance or access an instance through VNC.
Volumes	View, create, edit, and delete volumes and volume types.
Flavors	View, create, edit, view extra specs for, and delete flavors. A flavor is size for an instance.
Images	View, create, edit properties for, and delete custom images.
Networks	View, create, edit properties for, and delete networks.
Routers	View, create, edit properties for, and delete routers.
Defaults	View default quota values. Quotas are hard-coded in OpenStack Compute and define the maximum allowable size and number of resources.
System Info	<p>Use the following tabs to view the service info:</p> <p>Services tab. View a list of the services.</p> <p>Compute Services tab. View a list of all Compute services.</p> <p>Availability Zones tab. View the availability zones.</p> <p>Host Aggregates tab. View host aggregates.</p> <p>Network Agents tab. View the network agents.</p>
Domains	View domains.

Projects	View, create, assign users to, remove users from, and delete projects.
Users	View, create, enable, disable, and delete users.
Groups	View, create, enable, disable, and delete groups.
Roles	View, create, enable, disable, and delete roles.

Manage projects and users

As a cloud administrator, you manage both projects and users. Projects are organizational units in the cloud to which you can assign users. Projects are also known as *tenants* or *accounts*. You can manage projects and users independently from each other.

Users are members of one or more projects.

During cloud set up, the operator defines at least one project, user, and role. The operator links the role to the user and the user to the project. Roles define the actions that users can perform. As an administrator, you can create additional projects and users as needed.

Learn how to add, update, and delete projects and users, assign users to one or more projects, and change or remove the assignment. To enable or temporarily disable a project or user, update that project or user. You can also change quotas at the project level. For information, see [the section called “View and manage quotas” \[23\]](#).

When you create a user account, you must assign the account to a primary project. Optionally, you can assign the account to additional projects. Before you can delete a user account, you must remove the user account from its primary project.

Consequences of disabling projects and users

When you disable a project, it has the following consequences:

- In the dashboard, users can no longer access the project from the **CURRENT PROJECT** drop-down list on the **Project** tab.
- Users who are members of only the disabled project can no longer log in.
- You cannot launch instances for a disabled project. Instances that are already running are not automatically terminated though—you must stop them manually.
- The data for a disabled project is maintained so that you can enable the project again at any time.

When you disable a user account, the user can no longer log in, but the data for the user is maintained so that you can enable the user again at any time.

Create a project

1. Log in to the dashboard and choose the **admin** project from the **CURRENT PROJECT** drop-down list.
2. On the **Admin** tab, click the **Projects** category.
3. Click **Create Project**.
4. On the **Project Info** tab in the **Create Project** window, enter a name and description for the project. By default, the project is enabled. See [the section called “Consequences of disabling projects and users” \[6\]](#).

5. On the **Project Members** tab, add members to the project.
6. On the **Quota** tab, edit quota values. For information about quotas, see [the section called “View and manage quotas” \[23\]](#).
7. Click **Create Project**.

The **Projects** category shows the project, including its assigned ID.

Update a project

You can update a project to change its name or description, and enable or temporarily disable it.

1. On the **Admin** tab, click the **Projects** category.
2. Select the project that you want to update.
3. In the **More** drop-down list, click **Edit Project**.
4. In the **Edit Project** window, you can update a project to change its name or description, and enable or temporarily disable it.

By default, the project is enabled. To temporarily disable it, clear the **Enabled** check box. To enable a disabled project, select the **Enabled** check box.

5. Click **Save**.

Modify user assignments for a project

When you create users, you must assign them to a primary project as described in [the section called “Create a user account” \[8\]](#). You can assign users to additional projects or update and remove assignments.

1. On the **Admin** tab, select the **Projects** category.
2. Select a project to modify its user assignments.
3. Select **Modify Users**.

The **Edit Project** window shows the following lists of users:

- **All Users**. Users that are available to be assigned to the current project.
- **Project Members**. Users that are assigned to the current project,

Figure 1.3. Edit the users list

Edit Project ✕

Project Info | **Project Members** | Quota

All Users	Filter	Q
admin		+

Project Members	Filter	Q
glance	admin, _member_ ▾	-
neutron	admin, _member_ ▾	-
nova	admin, _member_ ▾	-
cinder	admin, _member_ ▾	-

Cancel Save

4. To assign a user to the current project, click + for the user.
The user moves from the **All Users** list to the **Project Members** list.
5. To remove a user from the current project, click the - button for the user.
The user moves from the **Project Members** list to the **All Users** list.
6. Click **Save**.

Delete projects

1. On the **Admin** tab, click the **Projects** category.
2. Select the projects that you want to delete.
3. Click **Delete Projects** to confirm the deletion.



Note

You cannot undo the delete action.

Create a user account

1. Log in to the dashboard and choose the **admin** project from the **CURRENT PROJECT** drop-down list.
2. On the **Admin** tab, select the **Users** category.

3. Click **Create User**.
4. In the **Create User** window, enter a user name, email, and preliminary password for the user. Confirm the password.

Select a project from the **Primary Project** drop-down list.

Choose a role for the user from the **Role** drop-down list. Default is `Member`.

5. Click **Create User** to confirm your changes.

Respond to the prompt to remember the password for the user.

The dashboard assigns an ID to the user, and the user appears in the **Users** category.

Disable or enable a user

1. On the **Admin** tab, select the **Users** category.
2. Select the user that you want to disable or enable. You can disable or enable only one user at a time.
3. In the **Actions** drop-down list, select **Disable User** or **Enable User**.

In the **Enabled** column, the enabled value updates to either `True` or `False`.

Delete users

1. On the **Admin** tab, select the **Users** category.
2. Select the users that you want to delete.
3. Click **Delete Users**.
4. In the **Confirm Delete Users** window, click **Delete Users** to confirm the deletion.

Manage project security

Security groups are sets of IP filter rules that are applied to all project instances, and which define networking access to the instance. Group rules are project specific; project members can edit the default rules for their group and add new rule sets.

All projects have a default security group that is applied to any instance that has no other defined security group. Unless you change the default, this security group denies all incoming traffic and allows only outgoing traffic to your instance.



Note

For information about updating global controls on the command line, see [the section called “Manage project security” \[39\]](#).

Create a security group

1. Log in to the dashboard as a project member.

2. On the **Project** tab, select the appropriate project from the **CURRENT PROJECT** drop-down list, and click the **Access & Security** category.
3. On the **Security Groups** tab, click **Create Security Group**.
4. Provide a name and appropriate description for the group, and click **Create Security Group**. By default, the new rule provides outgoing access rules for the group.

Add a security group rule

1. Log in to the dashboard as a project member.
2. On the **Project** tab, select the appropriate project from the **CURRENT PROJECT** drop-down list, and click the **Access & Security** category.
3. On the **Security Groups** tab, click **Edit rules** for the appropriate security group.
4. To add a rule, click **Add Rule**. Set the attributes for the rule, and click **Add**:

IP Protocol	The IP protocol to which the rule applies: <ul style="list-style-type: none">• TCP. Typically used to exchange data between systems, and for end-user communication.• UDP. Typically used to exchange data between systems, particularly at the application level.• ICMP. Typically used by network devices, such as routers, to send error or monitoring messages.
Open	<p>For TCP or UDP rules, the Port or Port Range to open for the rule. Choose to open a single port or range of ports.</p> <p>For a range of ports, enter port values in the From Port and To Port fields.</p> <p>For a single port, enter the port value in the Port field.</p>
Source	<p>The source of the traffic for this rule:</p> <ul style="list-style-type: none">• CIDR (Classless Inter-Domain Routing). IP address block, which limits access to IPs within the block. Enter the CIDR in the Source field.• Security Group. Source group that enables any instance in the group to access any other group instance.

Delete a security group rule

1. Log in to the dashboard as a project member.
2. On the **Project** tab, select the appropriate project from the **CURRENT PROJECT** drop-down list, and click the **Access & Security** category.
3. On the **Security Groups** tab, click **Edit rules** for the appropriate security group.

4. To delete a rule, select the rule and click **Delete Rule**.

Delete a security group

1. Log in to the dashboard as a project member.
2. On the **Project** tab, select the appropriate project from the **CURRENT PROJECT** drop-down list, and click the **Access & Security** category.
3. On the **Security Groups** tab, select the appropriate group, and click **Delete Security Group**.

Create and manage roles

A role is a personality that a user assumes to perform a specific set of operations. A role includes a set of rights and privileges. A user assuming that role inherits those rights and privileges.



Note

OpenStack Identity service defines a user's role on a project but it is completely up to the individual service to define what that role means. This is referred to as the service's policy. To get details about what the privileges for each role are, refer to the `policy.json` file available for each service in the `/etc/SERVICE/policy.json` file. For example, the policy defined for OpenStack Identity service is defined in the `/etc/keystone/policy.json` file.

Create a role

1. Log in to the dashboard and choose the **admin** project from the **CURRENT PROJECT** drop-down list.
2. On the **Admin** tab, click the **Roles** category.
3. Click the **Create Role** button.

In the **Create Role** window, enter a name for the role.

4. Click the **Create Role** button to confirm your changes.

Edit a role

1. Log in to the dashboard and choose the **admin** project from the **CURRENT PROJECT** drop-down list.
2. On the **Admin** tab, click the **Roles** category.
3. Click the **Edit** button.

In the **Update Role** window, enter a new name for the role.

4. Click the **Update Role** button to confirm your changes.



Note

Using the dashboard, you can edit only the name assigned to a role.

Delete a role

1. Log in to the dashboard and choose the **admin** project from the **CURRENT PROJECT** drop-down list.
2. On the **Admin** tab, click the **Roles** category.

3. Select the role you want to delete and click the **Delete Roles** button.

Manage instances

As an administrative user, you can manage instances for users in various projects. You can view, terminate, edit, perform a soft or hard reboot, create a snapshot from, and migrate instances. You can also view the logs for instances or launch a VNC console for an instance.

For information about using the dashboard to launch instances as an end user, see the [OpenStack End User Guide](#).

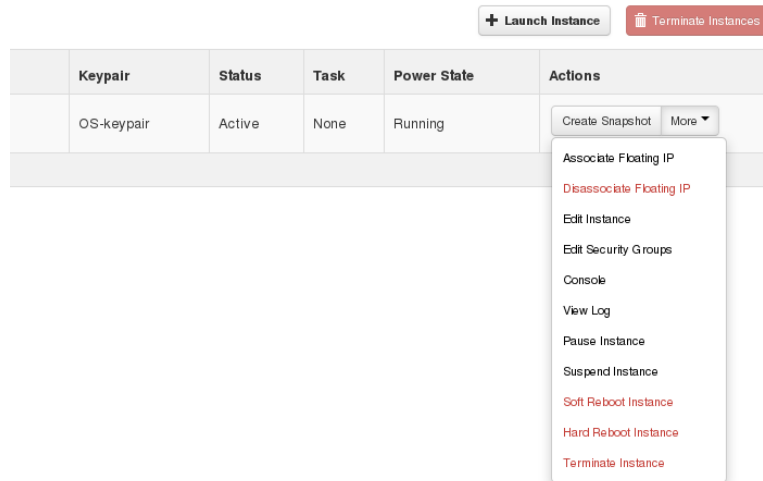
Create instance snapshots

1. Log in to the dashboard and choose the **admin** project from the **CURRENT PROJECT** drop-down list.
2. On the **Admin** tab, click the **Instances** category.
3. Select an instance to create a snapshot from it. From the **Actions** drop-down list, select **Create Snapshot**.
4. In the **Create Snapshot** window, enter a name for the snapshot. Click **Create Snapshot**. The dashboard shows the instance snapshot in the **Images & Snapshots** category.
5. To launch an instance from the snapshot, select the snapshot and click **Launch**. For information about launching instances, see the [OpenStack End User Guide](#).

Control the state of an instance

1. Log in to the dashboard and choose the **admin** project from the **CURRENT PROJECT** drop-down list.
2. On the **Admin** tab, click the **Instances** category.
3. Select the instance for which you want to change the state.
4. In the **More** drop-down list in the **Actions** column, select the state.

Depending on the current state of the instance, you can choose to pause, un-pause, suspend, resume, soft or hard reboot, or terminate an instance (items in red are disabled).

Figure 1.4. Dashboard—Instance Actions

The screenshot shows a table with columns: Keypair, Status, Task, Power State, and Actions. The first row has values: OS-keypair, Active, None, Running. The Actions column for this row contains a 'Create Snapshot' button and a 'More' dropdown menu. The dropdown menu is open, showing a list of actions: Associate Floating IP, Disassociate Floating IP, Edit Instance, Edit Security Groups, Console, View Log, Pause Instance, Suspend Instance, Soft Reboot Instance, Hard Reboot Instance, and Terminate Instance. Above the table, there are two buttons: '+ Launch Instance' and 'Terminate Instances'.

Keypair	Status	Task	Power State	Actions
OS-keypair	Active	None	Running	Create Snapshot More

- Associate Floating IP
- Disassociate Floating IP
- Edit Instance
- Edit Security Groups
- Console
- View Log
- Pause Instance
- Suspend Instance
- Soft Reboot Instance
- Hard Reboot Instance
- Terminate Instance

Track usage

Use the **Overview** category to track usage of instances for each project.

You can track costs per month by showing metrics like number of VCPUs, disks, RAM, and uptime of all your instances.

1. Log in to the dashboard and choose the **admin** project from the **CURRENT PROJECT** drop-down list.
2. On the **Admin** tab, click the **Instances** category.
3. Select a month and click **Submit** to query the instance usage for that month.
4. Click **Download CSV Summary** to download a CSV summary.

Manage volumes and volume types

Volumes are the Block Storage devices that you attach to instances to enable persistent storage. Users can attach a volume to a running instance or detach a volume and attach it to another instance at any time. For information about using the dashboard to create and manage volumes as an end user, see the [OpenStack End User Guide](#).

As an administrative user, you can manage volumes and volume types for users in various projects. You can create and delete volume types, and you can view and delete volumes.

Create a volume type

1. Log in to the dashboard and choose the **admin** project from the **CURRENT PROJECT** drop-down list.
2. On the **Admin** tab, click the **Volumes** category.
3. Click **Create Volume Type**.

In the **Create Volume Type** window, enter a name for the volume type.

4. Click **Create Volume Type** to confirm your changes.

Delete volume types

When you delete a volume type, volumes of that type are not deleted.

1. Log in to the dashboard and choose the **admin** project from the **CURRENT PROJECT** drop-down list.
2. On the **Admin** tab, click the **Volumes** category.
3. Select the volume type or types that you want to delete.
4. Click **Delete Volume Types**.
5. In the **Confirm Delete Volume Types** window, click **Delete Volume Types** to confirm the action.
6. A message indicates whether the action succeeded.

Delete volumes

When you delete an instance, the data of its attached volumes is not destroyed.

1. Log in to the dashboard and choose the **admin** project from the **CURRENT PROJECT** drop-down list.
2. On the **Admin** tab, click the **Volumes** category.
3. Select the volume or volumes that you want to delete.
4. Click **Delete Volumes**.

5. In the **Confirm Delete Volumes** window, click **Delete Volumes** to confirm the action.
6. A message indicates whether the action succeeded.

Create and manage images

As an administrative user, you can create and manage images for the projects to which you belong. You can also create and manage images for users in all projects to which you have access.

To create and manage images in specified projects as an end user, see the [OpenStack End User Guide](#).

To create and manage images as an administrator for other users, use the following procedures.

Create images

For details about image creation, see the [Virtual Machine Image Guide](#).

1. Log in to the dashboard.

Choose the **admin** project from the **CURRENT PROJECT** drop-down list.

2. On the **Admin** tab, click the **Images** category. The images that you can administer for cloud users appear on this page.
3. Click **Create Image**.
4. In the **Create An Image** window, enter or select the following values:

Name	Enter a name for the image.
Description	Enter a brief description about the image.
Image Source	Choose the image source from the dropdown list. Your choices are Image Location and Image File .
Image File or Image Location	Based on your selection, there is an Image File or Image Location field. You can include the location URL or browse for the image file on your file system and add it.
Format	Select the image format.
Minimum Disk (GB) and Minimum Disk (MB)	Leave these fields empty.
Public	Select this option to make the image public to all users.
Protected	Select this option to ensure that only users with permissions can delete it.

5. Click **Create Image**.

The image is queued to be uploaded. It might take some time before the status changes from queued to active.

Update images

1. Log in to the dashboard.
Choose the **admin** project from the **CURRENT PROJECT** drop-down list.
2. On the **Admin** tab, click the **Images** category.
3. Select the image that you want to edit. Click **Edit**.
4. In the **Update Image** window, you can change the name for the image. Select the **Public** check box to make the image public. Clear this check box to make the image private. You cannot change the kernel ID, RAM disk ID, or architecture attributes for an image.
5. Click **Update Image**.

Delete images

1. Log in to the dashboard.
Choose the **admin** project from the **CURRENT PROJECT** drop-down list.
2. On the **Admin** tab, click the **Images** category.
3. Select the images that you want to delete.
4. Click **Delete Images**.
5. In the **Confirm Delete Image** window, click **Delete Images** to confirm the deletion.
You cannot undo this action.

Manage flavors

In OpenStack, a flavor defines the compute, memory, and storage capacity of a virtual server that users can launch. As an administrative user, you can create, edit, and delete flavors.

Only administrative users can create and manage flavors.

A flavor consists of the following parameters:

Table 1.1. Flavor parameters

Parameter	Description
Flavor Name	The flavor name.
VCPUs	Number of virtual CPUs to use.
RAM	Amount of RAM to use, in megabytes.
Root Disk	Amount of disk space (in gigabytes) to use for the root (/) partition.
Ephemeral Disk	<p>Amount of disk space (in gigabytes) to use for the ephemeral partition. If unspecified, the value is 0 by default.</p> <p>Ephemeral disks offer machine local disk storage linked to the life cycle of a VM instance. When a VM is terminated, all data on the ephemeral disk is lost. Ephemeral disks are not included in any snapshots.</p>
Swap Disk	Amount of swap space (in megabytes) to use. If unspecified, the default is 0.
ID	<p>The flavor ID is generated by OpenStack if the option selected is auto.</p> <p>By default, this field is set to auto.</p>
Public	Indicates if the flavor is public.

The default flavors are:

- m1.tiny (1 VCPU/0 GB Disk/512 MB RAM)
- m1.small (1 VCPU/20 GB Disk/2048 MB RAM)
- m1.medium (2 VCPU/40 GB Disk/4096 MB RAM)
- m1.large (4 VCPU/80 GB Disk/8192 MB RAM)
- m1.xlarge (8 VCPU/160 GB Disk/16384 MB RAM)

Create flavors

1. Log in to the dashboard.
Choose the **admin** project from the **CURRENT PROJECT** drop-down list.
2. On the **Admin** tab, click the **Flavors** category.

3. Click **Create Flavor**.
4. In the **Create Flavor** window, enter or select the following values:

Flavor Info tab	
Name	Enter the flavor name.
ID	The flavor ID, generated by OpenStack.
VCPUs	Enter the number of virtual CPUs to use.
RAM MB	Enter the amount of RAM to use, in megabytes.
Root Disk GB	Enter the mount of disk space in gigabytes to use for the root (/) partition.
Ephemeral Disk GB	<p>Enter the amount of disk space in gigabytes to use for the ephemeral partition. If unspecified, the value is 0 by default.</p> <p>Ephemeral disks offer machine local disk storage linked to the life cycle of a VM instance. When a VM is terminated, all data on the ephemeral disk is lost. Ephemeral disks are not included in any snapshots.</p>
Swap Disk MB	Enter the amount of swap space (in megabytes) to use. If unspecified, the default is 0.

5. In the **Flavor Access** tab, you can control access to the flavor by moving projects from the **All Projects** column to the **Selected Projects** column.

Only projects in the **Selected Projects** column can use the flavor. If there are no projects in the right column, all projects can use the flavor.

6. Click **Create Flavor**.

Update flavors

1. Log in to the dashboard.
Choose the **admin** project from the **CURRENT PROJECT** drop-down list.
2. On the **Admin** tab, click the **Flavors** category.
3. Select the flavor that you want to edit. Click **Edit Flavor**.
4. In the **Edit Flavor** window, you can change the flavor name, VCPUs, RAM, root dish, ephemeral disk, and swap disk values..
5. Click **Save**.

Delete flavors

1. Log in to the dashboard.
Choose the **admin** project from the **CURRENT PROJECT** drop-down list.
2. On the **Admin** tab, click the **Flavors** category.
3. Select the flavors that you want to delete.
4. Click **Delete Flavors**.

5. In the **Confirm Delete Flavors** window, click **Delete Flavors** to confirm the deletion. You cannot undo this action.

View and manage quotas

To prevent system capacities from being exhausted without notification, you can set up quotas. Quotas are operational limits. For example, the number of gigabytes allowed for each tenant can be controlled so that cloud resources are optimized. Quotas can be enforced at both the tenant (or project) and the tenant-user level.

Typically, you change quotas when a project needs more than ten volumes or 1 TB on a compute node.

Using the Dashboard, you can view default Compute and Block Storage quotas for new tenants, as well as update quotas for existing tenants.



Note

Using the command-line interface, you can manage quotas for the OpenStack Compute service, the OpenStack Block Storage service, and the OpenStack Networking service (see [the section called “Manage quotas” \[64\]](#)). Additionally, you can update Compute service quotas for tenant users.

The following table describes the Compute and Block Storage service quotas:

Table 1.2. Quota Descriptions

Quota Name	Defines the number of	Service
Gigabytes	Volume gigabytes allowed for each project.	Block Storage
Instances	Instances allowed for each project.	Compute
Injected Files	Injected files allowed for each project.	Compute
Injected File Content Bytes	Content bytes allowed for each injected file.	Compute
Keypairs	Number of keypairs.	Compute
Metadata Items	Metadata items allowed for each instance.	Compute
RAM (MB)	RAM megabytes allowed for each instance.	Compute
Security Groups	Security groups allowed for each project.	Compute
Security Group Rules	Rules allowed for each security group.	Compute
Snapshots	Volume snapshots allowed for each project.	Block Storage
VCPUs	Instance cores allowed for each project.	Compute
Volumes	Volumes allowed for each project.	Block Storage

View default project quotas

1. Log in to the OpenStack dashboard.

2. On the **Admin** tab, click the **Defaults** category.
3. The default quota values are displayed.



Note

You can sort the table by clicking on either the **Quota Name** or **Limit** column headers.

Update project quotas

1. Log in to the OpenStack dashboard.
2. On the **Admin** tab, click the **Defaults** category.
3. Click the **Update Defaults** button.
4. In the **Update Default Quotas** window, you can edit the default quota values.
5. Click the **Update Defaults** button.



Note

The dashboard does not show all possible project quotas. To view and update the quotas for a service, use its command-line client. See [the section called "Manage quotas" \[64\]](#).

View cloud resources

View services information

As an administrative user, you can view information for OpenStack services.

1. Log in to the OpenStack dashboard and choose the **admin** project from the **CURRENT PROJECT** drop-down list.
2. On the **Admin** tab, click the **System Info** category.
3. Click the:
 - **Services** tab to view services information.

The page displays the internal name and the public OpenStack name for the service, the host where the service runs, and whether the service is or is not enabled.

- **Compute Services** tab to view services specific to the Compute Service. Both host and zone are listed for each service, as well as its activation status.



Note

The **System Info** window also offers status information for the following:

- **Availability Zones**
- **Host Aggregates**
- **Network Agents**

View cloud usage statistics

The Telemetry module provides user-level usage data for OpenStack-based clouds, which can be used for customer billing, system monitoring, or alerts. Data can be collected by notifications sent by existing OpenStack components (for example, usage events emitted from Compute) or by polling the infrastructure (for example, libvirt).



Note

You can only view metering statistics on the dashboard (available only to administrators). The Telemetry service must be set up and administered through the **ceilometer** command-line interface (CLI).

For basic administration information, refer to the "Measure Cloud Resources" chapter in the *OpenStack End User Guide*.

View resource statistics

1. Log in to the OpenStack dashboard as a user with Admin privileges.
2. On the **Admin** tab, click the **Resource Usage** category.

3. Click the:

- **Global Disk Usage** tab to view disk usage per tenant (project).
- **Global Network Traffic Usage** tab to view ingress or egress usage per tenant (project).
- **Global Object Storage Usage** tab to view incoming and outgoing storage bytes per tenant (project).
- **Global Network Usage** tab to view duration and creation requests for networks, subnets, routers, ports, and floating IPs, per tenant (project).
- **Stats** tab to view a multi-series line chart with user-defined metrics. You group by project, define the value type (min, max, avg, or sum), and specify the time period (or even use a calendar to define a date range).

Launch and manage stacks

The Orchestration service provides a template-based orchestration engine for the OpenStack cloud, which can be used to create and manage cloud infrastructure resources such as storage, networking, instances, and applications as a repeatable running environment.

Templates are used to create stacks, which are collections of resources. For example, a stack might include instances, floating IPs, volumes, security groups, or users. The Orchestration service offers access to all OpenStack core services via a single modular template, with additional orchestration capabilities such as auto-scaling and basic high availability.

For information about:

- Administrative tasks on the command line, see [the section called “Launch and manage stacks” \[63\]](#).



Note

There are no administration-specific tasks that can be done through the dashboard.

- The basic creation and deletion of Orchestration stacks, refer to the [End User Guide](#).

2. OpenStack command-line clients

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Overview

You can use the OpenStack command-line clients to run simple commands that make API calls. You can run these commands from the command line or in scripts to automate tasks. As long as you provide OpenStack credentials, you can run these commands on any machine.

Internally, each client command runs cURL commands that embed API requests. The OpenStack APIs are RESTful APIs that use the HTTP protocol, including methods, URIs, media types, and response codes.

These open-source Python clients run on Linux or Mac OS X systems and are easy to learn and use. Each OpenStack service has its own command-line client. On some client commands, you can specify a *debug* parameter to show the underlying API request for the command. This is a good way to become familiar with the OpenStack API calls.

The following table lists the command-line client for each OpenStack service, together with its package name and description.

Table 2.1. OpenStack services and clients

Service	Client	Package	Description
Block Storage	cinder	python-cinderclient	Create and manage volumes.
Compute	nova	python-novaclient	Create and manage images, instances, and flavors.
Database Service	trove	python-troveclient	Create and manage databases.
Identity	keystone	python-keystoneclient	Create and manage users, tenants, roles, endpoints, and credentials.
Image Service	glance	python-glanceclient	Create and manage images.
Networking	neutron	python-neutronclient	Configure networks for guest servers. This client was previously known as quantum .
Object Storage	swift	python-swiftclient	Gather statistics, list items, update metadata, and upload, download, and delete files stored by the Object Storage

Service	Client	Package	Description
			service. Gain access to an Object Storage installation for ad hoc processing.
Orchestration	heat	python-heatclient	Launch stacks from templates, view details of running stacks including events and resources, and update and delete stacks.
Telemetry	ceilometer	python-ceilometerclient	Create and collect measurements across OpenStack.

An OpenStack **common** client is in development.

For client installation instructions, see [Install the OpenStack command-line clients](#). For information about the OpenStack RC file, see [Download and source the OpenStack RC file](#).

Get the version for a client

Run this command get the version number for a client:

```
$ PROJECT --version
```

Where *PROJECT* is a project name:

- *ceilometer* - Telemetry API.
- *cinder* - Block Storage API and extensions.
- *glance* - Image Service API.
- *heat* - Orchestration API.
- *keystone* - Identity service API and extensions.
- *neutron* - Networking API.
- *nova* - Compute API and extensions.
- *swift* - Object Storage API.
- *trove* - Database Service API.

For example, to see the version number for the **nova** client, run this command:

```
$ nova --version  
2.15.0
```

To see the version number for the **keystone** client, run this command:

```
$ keystone --version  
0.4.0
```

Get help for client commands

To get usage information, including a list of commands with descriptions, for a client, run the following command:

```
$ CLIENT_NAME help
```

For example, to get help information for the swift client, run the following command:

```
$ swift help
```

```
Usage: swift [--version] [--help] [--snet] [--verbose]
        [--debug] [--quiet] [--auth <auth_url>]
        [--auth-version <auth_version>] [--user <username>]
        [--key <api_key>] [--retries <num_retries>]
        [--os-username <auth-user-name>] [--os-password <auth-password>]
        [--os-tenant-id <auth-tenant-id>]
        [--os-tenant-name <auth-tenant-name>]
        [--os-auth-url <auth-url>] [--os-auth-token <auth-token>]
        [--os-storage-url <storage-url>] [--os-region-name <region-name>]
        [--os-service-type <service-type>]
        [--os-endpoint-type <endpoint-type>]
        [--os-cacert <ca-certificate>] [--insecure]
        [--no-ssl-compression]
        <subcommand> ...
```

Command-line interface to the OpenStack Swift API.

Positional arguments:

<subcommand>	
delete	Delete a container or objects within a container
download	Download objects from containers
list	Lists the containers for the account or the objects for a container
post	Updates meta information for the account, container, or object
stat	Displays information for the account, container, or object
upload	Uploads files or directories to the given container

Examples:

```
swift -A https://auth.api.rackspacecloud.com/v1.0 -U user -K api_key stat -v

swift --os-auth-url https://api.example.com/v2.0 --os-tenant-name tenant \
  --os-username user --os-password password list

swift --os-auth-token 6ee5eb33efad4e45ab46806eac010566 \
  --os-storage-url https://10.1.5.2:8080/v1/AUTH_ced809b6a4baea7aeab61a \
  list

swift list --lh
```



Note

Depending on your credentials, you might not have permission to use every command.

After the `help` command, you can enter a command name to get help for that command, as follows:

```
$ CLIENT_NAME help COMMAND_NAME
```

For example, to get help for the glance **image-show** command, enter the following command:

```
$ glance help image-show
```

The command returns a description of the command and its positional and optional arguments:

```
usage: glance image-show [--human-readable] <IMAGE>

Describe a specific image.

Positional arguments:
  <IMAGE>          Name or ID of image to describe.

Optional arguments:
  --human-readable  Print image size in a human-friendly format.
```


Manage projects, users, and roles

As a cloud administrator, you manage projects, users, and roles. Projects are organizational units in the cloud to which you can assign users. Projects are also known as *tenants* or *accounts*. Users can be members of one or more projects. Roles define which actions users can perform. You assign roles to user-project pairs.

You can define actions for OpenStack service roles in the `/etc/PROJECT/policy.json` files. For example, define actions for Compute service roles in the `/etc/nova/policy.json` file.

You can manage projects, users, and roles independently from each other.

During cloud set up, the operator defines at least one project, user, and role.

Learn how to add, update, and delete projects and users, assign users to one or more projects, and change or remove the assignment. To enable or temporarily disable a project or user, you update that project or user. You can also change quotas at the project level.

Before you can delete a user account, you must remove the user account from its primary project.

Before you can run keystone client commands, you must download and source an OpenStack RC file. See [Download and source the OpenStack RC file](#).

Services

To look at your service catalog, use these keystone client commands.

service-create

Keyword arguments:

- Name
- Type
- Description

Example:

```
$ keystone service create \  
--name=nova \  
--type=compute \  
--description="Nova Compute Service"
```

service-list

Arguments

- service_id

Example:

```
$ keystone service-list
```

service-get

Arguments

- service_id

Example:

```
$ keystone service-get 08741d8ed88242ca88d1f61484a0fe3b
```

service-delete

Arguments

- service_id

Example:

```
$ keystone service-delete 08741d8ed88242ca88d1f61484a0fe3b
```

Create a tenant (project)

A tenant is a group of zero or more users. In nova, a tenant owns virtual machines. In swift, a tenant owns containers. In the Dashboard, tenants are represented as projects. Users can be associated with more than one tenant. Each tenant and user pairing can have a role associated with it.

1. To list all projects with their ID, name, and whether they are enabled or disabled:

```
$ keystone tenant-list
```

id	name	enabled
f7ac731cc11f40efbc03a9f9e1d1d21f	admin	True
c150ab41f0d9443f8874e32e725a4cc8	alt_demo	True
a9debfe41a6d4d09a677da737b907d5e	demo	True
9208739195a34c628c58c95d157917d7	invisible_to_admin	True
3943a53dc92a49b2827fae94363851e1	service	True
80cab5e1f02045abad92a2864cfd76cb	test_project	True

2. Create a project named new-project:

```
$ keystone tenant-create --name new-project --description 'my new project'
```

By default, the project is enabled.

Property	Value
description	my new project
enabled	True
id	1a4a0618b306462c9830f876b0bd6af2
name	new-project

Note the ID for the project so you can update it in the next procedure.

Update a project

Specify the project ID to update a project. You can update the name, description, and enabled status of a project.

1. To temporarily disable a project:

```
$ keystone tenant-update PROJECT_ID --enabled false
```

2. To enable a disabled project:

```
$ keystone tenant-update PROJECT_ID --enabled true
```

3. To update the name of a project:

```
$ keystone tenant-update PROJECT_ID --name project-new
```

4. To verify your changes, show information for the updated project:

```
$ keystone tenant-get PROJECT_ID
```

Property	Value
description	my new project
enabled	True
id	1a4a0618b306462c9830f876b0bd6af2
name	project-new

Delete a project

- To delete a project:

```
$ keystone tenant-delete PROJECT_ID
```

Create a user

1. To list all users:

```
$ keystone user-list
```

The output shows the ID, name, enabled status, and e-mail address for each user:

id	name	enabled	email
352b37f5c89144d4ad0534139266d51f	admin	True	admin@example.com
86c0de739bcb4802b8dc786921355813	demo	True	demo@example.com
32ec34aae8ea432e8af560a1cec0e881	glance	True	glance@example.com

```
| 7047fcb7908e420cb36e13bbd72c972c | nova | True | nova@example.com |
+-----+-----+-----+
+-----+
```

2. To create a user, you must specify a name. Optionally, you can specify a tenant ID, password, and email address. It is recommended that you include the tenant ID and password because the user cannot log in to the dashboard without this information.

To create the new-user user:

```
$ keystone user-create --name new-user --tenant_id
1a4a0618b306462c9830f876b0bd6af2 --pass PASSWORD
```

Property	Value
email	
enabled	True
id	6e5140962b424cb9814fb172889d3be2
name	new-user
tenantId	1a4a0618b306462c9830f876b0bd6af2

Update a user

You can update the name, email address, and enabled status for a user.

1. To temporarily disable a user account:

```
$ keystone user-update USER_ID --enabled false
```

If you disable a user account, the user cannot log in to the dashboard. However, data for the user account is maintained, so you can enable the user at any time.

2. To enable a disabled user account:

```
$ keystone user-update USER_ID --enabled true
```

3. To change the name and description for a user account:

```
$ keystone user-update USER_ID --name user-new --email new-user@example.com
```

```
User has been updated.
```

Delete a user

- To delete a specified user account:

```
$ keystone user-delete USER_ID
```

Create and assign a role

Users can be members of multiple projects. To assign users to multiple projects, define a role and assign that role to a user-project pair.

1. To list the available roles:

```
$ keystone role-list
```

id	name
71ccc37d41c8491c975ae72676db687f	Member
149f50a1fe684bfa88dae76a48d26ef7	ResellerAdmin
9fe2ff9ee4384b1894a90878d3e92bab	_member_
6ecf391421604da985db2f141e46a7c8	admin
deb4fffd123c4d02a907c2c74559dccf	anotherrole

2. To create the new-role role:

```
$ keystone role-create --name new-role
```

Property	Value
id	bef1f95537914b1295da6aa038ef4de6
name	new-role

3. To assign a user to a project, you must assign the role to a user-project pair. To do this, you need the user, role, and project IDs.

- a. To list users:

```
$ keystone user-list
```

id	name	enabled	email
352b37f5c89144d4ad0534139266d51f	admin	True	admin@example.com
981422ec906d4842b2fc2a8658a5b534	alt_demo	True	alt_demo@example.com
036e22a764ae497992f5fb8e9fd79896	cinder	True	cinder@example.com
86c0de739bcb4802b8dc786921355813	demo	True	demo@example.com
32ec34aae8ea432e8af560a1cec0e881	glance	True	glance@example.com
7047fcb7908e420cb36e13bbd72c972c	nova	True	nova@example.com

Note the ID of the user to which you want to assign the role.

- b. To list role IDs:

```
$ keystone role-list
```

id	name
----	------

71ccc37d41c8491c975ae72676db687f	Member
149f50a1fe684bfa88dae76a48d26ef7	ResellerAdmin
9fe2ff9ee4384b1894a90878d3e92bab	_member_
6ecf391421604da985db2f141e46a7c8	admin
deb4fffd123c4d02a907c2c74559dccf	anotherrole
bef1f95537914b1295da6aa038ef4de6	new-role

Note the ID of the role that you want to assign.

- c. To list projects:

```
$ keystone tenant-list
```

id	name	enabled
f7ac731cc11f40efbc03a9f9e1d1d21f	admin	True
c150ab41f0d9443f8874e32e725a4cc8	alt_demo	True
a9debfe41a6d4d09a677da737b907d5e	demo	True
9208739195a34c628c58c95d157917d7	invisible_to_admin	True
caa9b4ce7d5c4225aa25d6ff8b35c31f	new-user	True
1a4a0618b306462c9830f876b0bd6af2	project-new	True
3943a53dc92a49b2827fae94363851e1	service	True
80cab5e1f02045abad92a2864cfd76cb	test_project	True

Note the ID of the project to which you want to assign the role.

4. Assign a role to a user-project pair. In this example, you assign the `new-role` role to the `demo` and `test-project` pair:

```
$ keystone user-role-add --user USER_ID --role ROLE_ID --tenant TENANT_ID
```

5. To verify the role assignment:

```
$ keystone user-role-list --user USER_ID --tenant TENANT_ID
```

id	name	user_id
tenant_id		
bef1f95537914b1295da6aa038ef4de6	new-role	
86c0de739bcb4802b8dc786921355813		80cab5e1f02045abad92a2864cfd76cb

6. To get details for a specified role:

```
$ keystone role-get ROLE_ID
```

Property	Value
id	bef1f95537914b1295da6aa038ef4de6
name	new-role

7. To remove a role from a user-project pair:

```
$ keystone user-role-remove --user USER_ID --role ROLE_ID --tenant TENANT_ID
```

8. To verify the role removal, run the following command:

```
$ keystone user-role-list --user USER_ID --tenant TENANT_ID
```

If the role was removed, the command output omits the removed role.

Manage project security

Security groups are sets of IP filter rules that are applied to all project instances, and which define networking access to the instance. Group rules are project specific; project members can edit the default rules for their group and add new rule sets.

All projects have a "default" security group which is applied to any instance that has no other defined security group. Unless you change the default, this security group denies all incoming traffic and allows only outgoing traffic to your instance.



Note

For information about updating rules using the dashboard, see [the section called "Manage project security" \[9\]](#).

You can use the `allow_same_net_traffic` option in the `/etc/nova/nova.conf` file to globally control whether the rules applies to hosts which share a network.

If set to:

- True (default), hosts on the same subnet are not filtered and are allowed to pass all types of traffic between them. On a flat network, this allows all instances from all projects unfiltered communication. With VLAN networking, this allows access between instances within the same project. You can also simulate this setting by configuring the default security group to allow all traffic from the subnet.
- False, security groups are enforced for all connections.

Additionally, the number of maximum rules per security group is controlled by the `security_group_rules` and the number of allowed security groups per project is controlled by the `security_groups` quota (see [the section called "Manage quotas" \[64\]](#)).

List and view current security groups

From the command line you can get a list of security groups for the project you're acting in using the nova command:

1. Ensure your system variables are set for the user and tenant for which you are checking security group rules. For example:

```
export OS_USERNAME=demo00
export OS_TENANT_NAME=tenant01
```

2. Output security groups, as follows:

```
$ nova secgroup-list
+-----+-----+
| Name   | Description |
+-----+-----+
| default | default     |
| open   | all ports   |
+-----+-----+
```

3. View the details of a group, as follows:

```
$ nova secgroup-list-rules groupName
```

For example:

```
$ nova secgroup-list-rules open
+-----+-----+-----+-----+-----+
| IP Protocol | From Port | To Port | IP Range | Source Group |
+-----+-----+-----+-----+-----+
| icmp        | -1        | 255     | 0.0.0.0/0 |               |
| tcp         | 1         | 65535   | 0.0.0.0/0 |               |
| udp         | 1         | 65535   | 0.0.0.0/0 |               |
+-----+-----+-----+-----+-----+
```

These rules are allow type rules as the default is deny. The first column is the IP protocol (one of icmp, tcp, or udp) the second and third columns specify the affected port range. The third column specifies the IP range in CIDR format. This example shows the full port range for all protocols allowed from all IPs.

Create a security group

When adding a new security group, you should pick a descriptive but brief name. This name shows up in brief descriptions of the instances that use it where the longer description field often does not. For example, seeing that an instance is using security group "http" is much easier to understand than "bobs_group" or "secgrp1".

1. Ensure your system variables are set for the user and tenant for which you are checking security group rules.
2. Add the new security group, as follows:

```
$ nova secgroup-create GroupName Description
```

For example:

```
$ nova secgroup-create global_http "Allows Web traffic anywhere on the
Internet."
+-----+-----+-----+
| Id                  | Name          | Description |
+-----+-----+-----+
| 1578a08c-5139-4f3e-9012-86bd9dd9f23b | global_http | Allows Web traffic
anywhere on the Internet. |
+-----+-----+-----+
```


3. Add a new group rule, as follows:

```
$ nova secgroup-add-rule secGroupName ip-protocol from-port to-port CIDR
```

The arguments are positional, and the "from-port" and "to-port" arguments specify the local port range connections are allowed to access, not the source and destination ports of the connection. For example:

```
$ nova secgroup-add-rule global_http tcp 80 80 0.0.0.0/0
```

IP Protocol	From Port	To Port	IP Range	Source Group
tcp	80	80	0.0.0.0/0	

You can create complex rule sets by creating additional rules. For example, if you want to pass both http and https traffic, run:

```
$ nova secgroup-add-rule global_http tcp 443 443 0.0.0.0/0
```

IP Protocol	From Port	To Port	IP Range	Source Group
tcp	443	443	0.0.0.0/0	

Despite only outputting the newly added rule, this operation is additive (both rules are created and enforced).

4. View all rules for the new security group, as follows:

```
$ nova secgroup-list-rules global_http
```

IP Protocol	From Port	To Port	IP Range	Source Group
tcp	80	80	0.0.0.0/0	
tcp	443	443	0.0.0.0/0	

Delete a security group

1. Ensure your system variables are set for the user and tenant for which you are deleting a security group.
2. Delete the new security group, as follows:

```
$ nova secgroup-delete GroupName
```

For example:

```
$ nova secgroup-delete global_http
```

Create security group rules for a cluster of instances

SourceGroups are a special, dynamic way of defining the CIDR of allowed sources. The user specifies a SourceGroup (Security Group name), and all the users' other Instances using the specified SourceGroup are selected dynamically. This alleviates the need for individual rules to allow each new member of the cluster.

1. Make sure to set the system variables for the user and tenant for which you are deleting a security group.
2. Add a source group, as follows:

```
$ nova secgroup-add-group-rule secGroupName source-group ip-protocol from-port to-port
```

For example:

```
$ nova secgroup-add-group-rule cluster global_http tcp 22 22
```

The `cluster` rule allows ssh access from any other instance that uses the `global_http` group.

Manage services

Create and manage services and service users

The Identity Service enables you to define services, as follows:

- Service catalog template. The Identity Service acts as a service catalog of endpoints for other OpenStack services. The `etc/default_catalog.templates` template file defines the endpoints for services. When the Identity Service uses a template file back end, any changes that are made to the endpoints are cached. These changes do not persist when you restart the service or reboot the machine.
- A SQL back end for the catalog service. When the Identity Service is online, you must add the services to the catalog. When you deploy a system for production, use the SQL back end.

The `auth_token` middleware supports the use of either a shared secret or users for each service.

To authenticate users against the Identity Service, you must create a service user for each OpenStack service. For example, create a service user for the Compute, Block Storage, and Networking services.

To configure the OpenStack services with service users, create a project for all services and create users for each service. Assign the admin role to each service user and project pair. This role enables users to validate tokens and authenticate and authorize other user requests.

Create a service

1. List the available services:

```
$ keystone service-list
```

id	name	type	
9816f1faaa7c4842b90fb4821cd09223	cinder	volume	Cinder Volume Service
da8cf9f8546b4a428c43d5e032fe4afc	ec2	ec2	EC2 Compatibility Layer
5f105eeb55924b7290c8675ad7e294ae	glance	image	Glance Image Service
dcaa566e912e4c0e900dc86804e3dde0	keystone	identity	Keystone Identity Service
4a715cfbc3664e9ebf388534ff2be76a	nova	compute	Nova Compute Service
6feb2e0b98874d88bee221974770e372	s3	s3	S3

2. To create a service, run this command:

```
$ keystone service-create --name service_name --type service_type --description service_description
```

The arguments are:

- *service_name*. The unique name of the new service.
- *service_type*. The service type, such as *identity*, *compute*, *network*, *image*, *object-store* or any other service identifier string.
- *service_description*. The description of the service.

For example, to create a *swift* service of type *object-store*, run this command:

```
$ keystone service-create --name swift --type object-store --description "object store service"
```

Property	Value
description	object store service
id	84c23f4b942c44c38b9c42c5e517cd9a
name	swift
type	object-store

3. To get details for a service, run this command:

```
$ keystone service-get service_ID
```

For example:

```
$ keystone service-get 84c23f4b942c44c38b9c42c5e517cd9a
```

Property	Value
description	object store service
id	84c23f4b942c44c38b9c42c5e517cd9a
name	swift
type	object-store

Create service users

1. Create a project for the service users. Typically, this project is named *service*, but choose any name you like:

```
$ keystone tenant-create --name service
```

The output shows the ID for the project.

Make a note of this ID. You need it to create service users and assign roles.

Property	Value
----------	-------

description	
enabled	True
id	3e9f3f5399624b2db548d7f871bd5322
name	service

2. Create service users for the relevant services for your deployment.
3. To assign the admin role to the service user-project pairs, run this command to get the ID of the admin role:

```
$ keystone role-list
```

id	name
71ccc37d41c8491c975ae72676db687f	Member
149f50a1fe684bfa88dae76a48d26ef7	ResellerAdmin
9fe2ff9ee4384b1894a90878d3e92bab	_member_
6ecf391421604da985db2f141e46a7c8	admin
deb4fffd123c4d02a907c2c74559dccf	anotherrole
bef1f95537914b1295da6aa038ef4de6	new-role

4. Assign the admin role to the user-project pair:

```
$ keystone user-role-add --user SERVICE_USER_ID --role ADMIN_ROLE_ID --
tenant SERVICE_PROJECT_ID
```

Delete a service

To delete a specified service, specify its ID:

```
$ keystone service-delete SERVICE_ID
```

Property	Value
description	object store service
id	84c23f4b942c44c38b9c42c5e517cd9a
name	swift
type	object-store

Manage Compute services

You can enable and disable Compute services. The following examples disable and enable the nova-compute service.

1. List the Compute services:

```
$ nova service-list
```

Binary	Host	Zone	Status	State	Updated_at
nova-conductor	devstack	internal	enabled	up	2013-10-16T00:56:08.000000
nova-cert	devstack	internal	enabled	up	2013-10-16T00:56:09.000000
nova-compute	devstack	nova	enabled	up	2013-10-16T00:56:07.000000
nova-network	devstack	internal	enabled	up	2013-10-16T00:56:06.000000
nova-scheduler	devstack	internal	enabled	up	2013-10-16T00:56:04.000000
nova-consoleauth	devstack	internal	enabled	up	2013-10-16T00:56:07.000000

2. Disable a nova service:

```
$ nova service-disable localhost.localdomain nova-compute --reason 'trial log'
```

Host	Binary	Status	Disabled Reason
devstack	nova-compute	disabled	Trial log



Note

The Havana release introduces the optional `--reason` parameter that enables you to log a reason for disabling a service.

3. Check the service list:

```
$ nova service-list
```

Binary	Host	Zone	Status	State	Updated_at
nova-conductor	devstack	internal	enabled	up	2013-10-16T00:56:48.000000
nova-cert	devstack	internal	enabled	up	2013-10-16T00:56:49.000000
nova-compute	devstack	nova	disabled	up	2013-10-16T00:56:47.000000

```

| nova-network      | devstack | internal | enabled | up   |
2013-10-16T00:56:51.000000 | None      |          |         |     |
| nova-scheduler    | devstack | internal | enabled | up   |
2013-10-16T00:56:44.000000 | None      |          |         |     |
| nova-consoleauth  | devstack | internal | enabled | up   |
2013-10-16T00:56:47.000000 | None      |          |         |     |
+-----+-----+-----+-----+-----+
+-----+-----+-----+-----+-----+

```

4. Enable the service:

```

$ nova service-enable localhost.localdomain nova-compute
+-----+-----+-----+
| Host      | Binary          | Status |
+-----+-----+-----+
| devstack  | nova-compute    | enabled |
+-----+-----+-----+

```

5. Check the service list:

```

$ nova service-list
+-----+-----+-----+-----+-----+-----+
| Binary          | Host      | Zone     | Status | State | Updated_at |
| Disabled Reason |           |          |         |       |            |
+-----+-----+-----+-----+-----+-----+
| nova-conductor  | devstack  | internal | enabled | up    | 2013-10-16T00:57:08.000000 |
| 2013-10-16T00:57:08.000000 | None      |          |         |       |            |
| nova-cert       | devstack  | internal | enabled | up    | 2013-10-16T00:57:09.000000 |
| 2013-10-16T00:57:09.000000 | None      |          |         |       |            |
| nova-compute    | devstack  | nova     | enabled | up    | 2013-10-16T00:57:07.000000 |
| 2013-10-16T00:57:07.000000 | None      |          |         |       |            |
| nova-network    | devstack  | internal | enabled | up    | 2013-10-16T00:57:11.000000 |
| 2013-10-16T00:57:11.000000 | None      |          |         |       |            |
| nova-scheduler  | devstack  | internal | enabled | up    | 2013-10-16T00:57:14.000000 |
| 2013-10-16T00:57:14.000000 | None      |          |         |       |            |
| nova-consoleauth | devstack  | internal | enabled | up    | 2013-10-16T00:57:07.000000 |
| 2013-10-16T00:57:07.000000 | None      |          |         |       |            |
+-----+-----+-----+-----+-----+-----+
+-----+-----+-----+-----+-----+

```

Manage images

The cloud operator assigns roles to users. Roles determine who can upload and manage images. The operator might restrict image upload and management to only cloud administrators or operators.

You can upload images through the glance client or the Image Service API. You can also use the nova client to list images, set, and delete image metadata, delete images, and take a snapshot of a running instance to create an image. After you upload an image, you cannot change it.

For details about image creation, see the [Virtual Machine Image Guide](#).

List or get details for images (glance)

1. To list the available images:

```
$ glance image-list
```

ID	Disk Format	Container Format	Size	Name	Status
397e713c-b95b-4186-ad46-6126863ea0a9	ami	ami	25165824	cirros-0.3.1-x86_64-uec	active
df430cc2-3406-4061-b635-a51c16e488ac	aki	aki	4955792	cirros-0.3.1-x86_64-uec-kernel	active
3cf852bd-2332-48f4-9ae4-7d926d50945e	ari	ari	3714968	cirros-0.3.1-x86_64-uec-ramdisk	active
7e5142af-1253-4634-bcc6-89482c5f2e8a	ami	ami	14221312	myCirrosImage	active

You can use `grep` to filter the list, as follows:

```
$ glance image-list | grep 'cirros'
```

ID	Disk Format	Container Format	Size	Name	Status
397e713c-b95b-4186-ad46-6126863ea0a9	ami	ami	25165824	cirros-0.3.1-x86_64-uec	active
df430cc2-3406-4061-b635-a51c16e488ac	aki	aki	4955792	cirros-0.3.1-x86_64-uec-kernel	active
3cf852bd-2332-48f4-9ae4-7d926d50945e	ari	ari	3714968	cirros-0.3.1-x86_64-uec-ramdisk	active

2. To get image details, by name or ID:

```
$ glance image-show myCirrosImage
```

Property	Value
Property 'base_image_ref'	397e713c-b95b-4186-ad46-6126863ea0a9
Property 'image_location'	snapshot
Property 'image_state'	available
Property 'image_type'	snapshot
Property 'instance_type_ephemeral_gb'	0
Property 'instance_type_flavorid'	2
Property 'instance_type_id'	5
Property 'instance_type_memory_mb'	2048
Property 'instance_type_name'	m1.small
Property 'instance_type_root_gb'	20
Property 'instance_type_rxtx_factor'	1
Property 'instance_type_swap'	0
Property 'instance_type_vcpu_weight'	None
Property 'instance_type_vcpus'	1
Property 'instance_uuid'	84c6e57d-a6b1-44b6-81eb-fcb36afd31b5


```

Property 'kernel_id'      df430cc2-3406-4061-b635-a51c16e488ac
Property 'owner_id'      66265572db174a7aa66eba661f58eb9e
Property 'ramdisk_id'    3cf852bd-2332-48f4-9ae4-7d926d50945e
Property 'user_id'      376744b5910b4b4da7d8e6cb483b06a8
checksum                 8e4838effa1969ad591655d6485c7ba8
container_format         ami
created_at               2013-07-22T19:45:58
deleted                  False
disk_format              ami
id                       7e5142af-1253-4634-bcc6-89482c5f2e8a
is_public                 False
min_disk                 0
min_ram                  0
name                     myCirrosImage
owner                    66265572db174a7aa66eba661f58eb9e
protected                False
size                     14221312
status                   active
updated_at               2013-07-22T19:46:42

```



Note

To store location metadata for images, which enables direct file access for a client, update the `/etc/glance/glance.conf` file with the following statements:

- `show_multiple_locations = True`
- `filesystem_store_metadata_file = filePath`, where `filePath` points to a JSON file that defines the mount point for OpenStack images on your system and a unique ID. For example:

```
[{
  "id": "b9d69795-5951-4cb0-bb5c-29491e1e2daf",
  "mountpoint": "/var/lib/glance/images/"
}]
```

After you restart the Image Service, you can use the following syntax to view the image's location information:

```
$ glance --os-image-api-version=2 image-show imageID
```

For example:

```
$ glance --os-image-api-version=2 image-show 2d9bb53f-70ea-4066-a68b-67960eaae673
```

Create or update an image (glance)

1. To upload a CentOS 6.3 image in qcow2 format and configure it for public access:

```
$ glance image-create --name centos63-image --disk-format=qcow2 \
  --container-format=bare --is-public=True --file=./centos63.qcow2
```

2. To update an image by name or ID:

```
$ glance image-update IMAGE
```

To modify image properties, use the following optional arguments:

<code>--name NAME</code>	The name of the image.
<code>--disk-format DISK_FORMAT</code>	The disk format of the image. Acceptable formats are ami, ari, aki, vhd, vmdk, raw, qcow2, vdi, and iso.
<code>--container-format CONTAINER_FORMAT</code>	The container format of the image. Acceptable formats are ami, ari, aki, bare, and ovf.

<code>--owner TENANT_ID</code>	The tenant who should own the image.
<code>--size SIZE</code>	The size of image data, in bytes.
<code>--min-disk DISK_GB</code>	The minimum size of disk needed to boot image, in gigabytes.
<code>--min-ram DISK_RAM</code>	The minimum amount of ram needed to boot image, in megabytes.
<code>--location IMAGE_URL</code>	The URL where the data for this image resides. For example, if the image data is stored in swift, you could specify <code>swift://account:key@example.com/container/obj</code> .
<code>--file FILE</code>	Local file that contains disk image to be uploaded during update. Alternatively, you can pass images to the client through stdin.
<code>--checksum CHECKSUM</code>	Hash of image data to use for verification.
<code>--copy-from IMAGE_URL</code>	Similar to <code>--location</code> in usage, but indicates that the Image server should immediately copy the data and store it in its configured image store.
<code>--is-public [True/False]</code>	Makes an image accessible to the public.
<code>--is-protected [True/False]</code>	Prevents an image from being deleted.
<code>--property KEY=VALUE</code>	Arbitrary property to associate with image. Can be used multiple times.
<code>--purge-props</code>	Deletes all image properties that are not explicitly set in the update request. Otherwise, those properties not referenced are preserved.
<code>--human-readable</code>	Prints image size in a human-friendly format.

3. To annotate an image with a property that describes the `disk_bus`, `cdrom_bus`, and `vif_model`:

```
$ glance image-update \
  --property hw_disk_bus=scsi \
  --property hw_cdrom_bus=ide \
  --property hw_vif_model=e1000 \
  f16-x86_64-openstack-sda
```

Currently libvirt will determine the disk/cdrom/vif device models based on the configured hypervisor type (`libvirt_type` in `/etc/nova/nova.conf`). For the sake of optimal performance, it will default to using virtio for both disk and VIF (NIC) models. The downside of this approach is that it is not possible to run operating systems that lack virtio drivers, for example, BSD, Solaris, old Linux, and old Windows.

If you specify a disk or CD-ROM bus model that is not supported, see [Table 2.2, “Disk and CD-ROM bus model values” \[51\]](#). If you specify a VIF model that is not supported, the instance fails to launch. See [Table 2.3, “VIF model values” \[51\]](#).

The valid model values depend on the `libvirt_type` setting, as shown in the following tables:

Table 2.2. Disk and CD-ROM bus model values

libvirt_type setting	Supported model values
qemu or kvm	<ul style="list-style-type: none">• virtio• scsi• ide• virtio
xen	<ul style="list-style-type: none">• xen• ide

Table 2.3. VIF model values

libvirt_type setting	Supported model values
qemu or kvm	<ul style="list-style-type: none">• virtio• ne2k_pci• pcnet• rtl8139• e1000
xen	<ul style="list-style-type: none">• netfront• ne2k_pci• pcnet• rtl8139• e1000
vmware	<ul style="list-style-type: none">• VirtualE1000• VirtualPCNet32• VirtualVmxnet

Create image (nova)

You can use the nova client to list images, set and delete image metadata, delete images, and take a snapshot of a running instance to create an image.

The safest approach is to shut down the instance before you take a snapshot.

You cannot create a snapshot from an instance that has an attached volume. Detach the volume, create the image, and re-mount the volume.

1. Write any buffered data to disk.

For more information, see [Taking Snapshots](#) in the *OpenStack Operations Guide*.

2. To create the image, list instances to get the server ID:

```
$ nova list
```

ID	Name	Status	Task State	Power State	Networks
84c6e57d-a6b1-44b6-81eb-fcb36afd31b5	myCirrosServer	ACTIVE	None	Running	private=10.0.0.3

In this example, the server is named `myCirrosServer`. Use this server to create a snapshot, as follows:

```
$ nova image-create myCirrosServer myCirrosImage
```

The command creates a qemu snapshot and automatically uploads the image to your repository. Only the tenant that creates the image has access to it.

3. Get details for your image to check its status:

```
$ nova image-show IMAGE
```

Property	Value
metadata owner_id	66265572db174a7aa66eba661f58eb9e
minDisk	0
metadata instance_type_name	m1.small
metadata instance_type_id	5
metadata instance_type_memory_mb	2048
id	7e5142af-1253-4634-bcc6-89482c5f2e8a
metadata instance_type_root_gb	20
metadata instance_type_rxtx_factor	1
metadata ramdisk_id	3cf852bd-2332-48f4-9ae4-7d926d50945e
metadata image_state	available
metadata image_location	snapshot
minRam	0
metadata instance_type_vcpus	1
status	ACTIVE
updated	2013-07-22T19:46:42Z
metadata instance_type_swap	0
metadata instance_type_vcpu_weight	None
metadata base_image_ref	397e713c-b95b-4186-ad46-6126863ea0a9
progress	100
metadata instance_type_flavorid	2
OS-EXT-IMG-SIZE:size	14221312
metadata image_type	snapshot
metadata user_id	376744b5910b4b4da7d8e6cb483b06a8
name	myCirrosImage
created	2013-07-22T19:45:58Z
metadata instance_uuid	84c6e57d-a6b1-44b6-81eb-fcb36afd31b5
server	84c6e57d-a6b1-44b6-81eb-fcb36afd31b5
metadata kernel_id	df430cc2-3406-4061-b635-a51c16e488ac
metadata instance_type_ephemeral_gb	0

The image status changes from `SAVING` to `ACTIVE`. Only the tenant who creates the image has access to it.

4. To launch an instance from your image, include the image ID and flavor ID, as follows:

```
$ nova boot newServer --image 7e5142af-1253-4634-bcc6-89482c5f2e8a \
--flavor 3
```

Property	Value
OS-EXT-STS:task_state	scheduling
image	myCirrosImage
OS-EXT-STS:vm_state	building
OS-EXT-SRV-ATTR:instance_name	instance-00000007
flavor	m1.medium
id	d7efd3e4-d375-46d1-9d57-372b6e4bdb7f
security_groups	[[{'u'name': 'u'default'}]]
user_id	376744b5910b4b4da7d8e6cb483b06a8
OS-DCF:diskConfig	MANUAL
accessIPv4	
accessIPv6	
progress	0
OS-EXT-STS:power_state	0
OS-EXT-AZ:availability_zone	nova
config_drive	
status	BUILD
updated	2013-07-22T19:58:33Z
hostId	
OS-EXT-SRV-ATTR:host	None
key_name	None
OS-EXT-SRV-ATTR:hypervisor_hostname	None
name	newServer
adminPass	jis88nN46RGP
tenant_id	66265572db174a7aa66eba661f58eb9e
created	2013-07-22T19:58:33Z
metadata	{}

Troubleshoot image creation

- You cannot create a snapshot from an instance that has an attached volume. Detach the volume, create the image, and re-mount the volume.
- Make sure the version of qemu you are using is version 0.14 or greater. Older versions of qemu result in an "unknown option -s" error message in the `nova-compute.log`.
- Examine the `/var/log/nova-api.log` and `/var/log/nova-compute.log` log files for error messages.

Manage volumes

A volume is a detachable block storage device, similar to a USB hard drive. You can attach a volume to only one instance. To create and manage volumes, you use a combination of nova and cinder client commands.

Migrate a volume

As an administrator, you can migrate a volume with its data from one location to another in a manner that is transparent to users and workloads. You can migrate only detached volumes with no snapshots.

Possible use cases for data migration:

- Bring down a physical storage device for maintenance without disrupting workloads.
- Modify the properties of a volume.
- Free up space in a thinly-provisioned back end.

Migrate a volume, as follows:

```
$ cinder migrate volumeID destinationHost --force-host-copy=True/False
```

Where `--force-host-copy=True` forces the generic host-based migration mechanism and bypasses any driver optimizations.



Note

If the volume is in use or has snapshots, the specified host destination cannot accept the volume.

If the user is not an administrator, the migration fails.

Set a volume to read-only access

To give multiple users shared, secure access to the same data, you can set a volume to read-only access.

Run this command to set a volume to read-only access:

```
$ cinder read-only-mode-update VOLUME BOOLEAN
```

Where *VOLUME* is the ID of the target volume and *BOOLEAN* is a flag that enables read-only or read/write access to the volume.

Valid values for *BOOLEAN* are:

- `true`. Sets the read-only flag in the volume. When you attach the volume to an instance, the instance checks for this flag to determine whether to restrict volume access to read-only.
- `false`. Sets the volume to read/write access.

Manage flavors

In OpenStack, flavors define the compute, memory, and storage capacity of nova computing instances. To put it simply, a flavor is an available hardware configuration for a server. It defines the “size” of a virtual server that can be launched.

A flavor consists of the following parameters:

Flavor ID	Automatically generated by OpenStack. For private flavors, a value from 1 to 255.
Name	Name for the new flavor.
VCPUs	Number of virtual CPUs to use.
Memory MB	Amount of RAM to use (in megabytes).
Root Disk GB	Amount of disk space (in gigabytes) to use for the root (/) partition.
Ephemeral Disk GB	<p>Amount of disk space (in gigabytes) to use for the ephemeral partition. If unspecified, the value is 0 by default.</p> <p>Ephemeral disks offer machine local disk storage linked to the life cycle of a VM instance. When a VM is terminated, all data on the ephemeral disk is lost. Ephemeral disks are not included in any snapshots.</p>
Swap	Amount of swap space (in megabytes) to use. If unspecified, the value is 0 by default.

The default flavors are:

- m1.tiny (1 VCPU/0 GB Disk/512 MB RAM)
- m1.smaller (1 VCPU/0 GB Disk/1024 MB RAM)
- m1.small (1 VCPU/10 GB Disk/2048 MB RAM)
- m1.medium (2 VCPU/10 GB Disk/3072 MB RAM)
- m1.large (4 VCPU/10 GB Disk/8192 MB RAM)
- m1.xlarge (8 VCPU/10 GB Disk/8192 MB RAM)

You can create and manage flavors with the nova **flavor-*** commands provided by the `python-novaclient` package.

Create a flavor

1. List flavors to show the ID and name, the amount of memory, the amount of disk space for the root partition and for the ephemeral partition, the swap, and the number of virtual CPUs for each flavor.


```
$ nova flavor-list
```

2. To create a flavor, specify a name, ID, RAM size, disk size, and the number of VCPUs for the flavor, as follows:

```
$ nova flavor-  
create FLAVOR_NAME FLAVOR_ID RAM_IN_MB ROOT_DISK_IN_GB NUMBER_OF_VCPUS
```



Note

The flavor ID is a number from 1 to 255 and cannot contain special characters or spaces.

For a list of optional parameters, run this command:

```
$ nova help flavor-create
```

3. After you create a flavor, assign it to a project by specifying the flavor name or ID and the tenant ID:

```
$ nova flavor-access-add FLAVOR TENANT_ID
```

Delete a flavor

- Delete a specified flavor, as follows:

```
$ nova flavor-delete FLAVOR_ID
```

Manage the OpenStack environment

This section includes tasks specific to the OpenStack environment.

Select hosts where instances are launched

With the appropriate permissions, you can select which host instances are launched on and which roles can boot instances on this host.

1. To select the host where instances are launched, use the `--availability_zone zone:host` parameter on the **nova boot** command,

For example:

```
$ nova boot --image <uuid> --flavor ml.tiny --key_name test --availability-zone nova:server2
```

2. To specify which roles can launch an instance on a specified host, enable the `create:forced_host` option in the `policy.json` file. By default, this option is enabled for only the admin role.
3. To view the list of valid compute hosts, use the **nova hypervisor-list** command, as follows:

```
$ nova hypervisor-list
+-----+
| ID | Hypervisor hostname |
+-----+
| 1  | server2              |
| 2  | server3              |
| 3  | server4              |
+-----+
```



Note

- Beginning in the Folsom release, the `--availability_zone zone:host` parameter replaces the `--force_hosts` scheduler hint parameter.
- Beginning in the Grizzly release, you can enable the `create:forced_host` option in the `policy.json` file to specify which roles can launch an instance on a specified host.

Evacuate instances

If a cloud compute node fails due to a hardware malfunction or another reason, you can evacuate instances to make them available again.

You can choose evacuation parameters for your use case.

To preserve user data on server disk, you must configure shared storage on the target host. Also, you must validate that the current VM host is down. Otherwise the evacuation fails with an error.

1. To find a different host for the evacuated instance, run this command to list hosts:

```
$ nova host-list
```

2. You can pass the instance password to the command by using the `--password <pwd>` option. If you do not specify a password, one is generated and printed after the command finishes successfully. The following command evacuates a server without shared storage:

```
$ nova evacuate evacuated_server_name host_b
```

The command evacuates an instance from a down host to a specified host. The instance is booted from a new disk, but preserves its configuration including its ID, name, uid, IP address, and so on. The command returns a password:

```
+-----+-----+
| Property | Value |
+-----+-----+
| adminPass | kRAJpErnT4xZ |
+-----+-----+
```

3. To preserve the user disk data on the evacuated server, deploy OpenStack Compute with shared file system. To configure your system, see [Configure migrations](#) in *OpenStack Configuration Reference*. In this example, the password remains unchanged.

```
$ nova evacuate evacuated_server_name host_b --on-shared-storage
```

Manage IP addresses

Each instance can have a private, or *fixed*, IP address and an IP address, often public, that is movable from instance to instance called a *floating* IP address.

Private IP addresses are used for communication between instances and public ones are used for communication with the outside world.

When you launch an instance, it is automatically assigned a private IP address that stays the same until you explicitly terminate the instance. Rebooting an instance has no effect on its private IP address.

The cloud operator must configure a pool of floating IP addresses. Then, you can allocate a certain number of floating IP addresses from this pool to a project. A project quota defines the maximum number of floating IP addresses for the project.

You can add a floating IP address from this pool to an instance in the project. You can dynamically associate floating IP addresses with or disassociate floating IP addresses from instances in the same project at any time.

Before you can assign a floating IP address to an instance, you must allocate floating IP addresses to a project. After you allocate floating IP addresses to the current project, you can assign them to running instances.

You can assign one floating IP address to only one instance at a time. Use the **nova *floating-ip-*** commands to manage floating IP addresses.

To manage floating IP addresses

1. To list the floating IP address pools:

```
$ nova floating-ip-pool-list
+-----+
| name   |
+-----+
| public |
| test   |
+-----+
```



Note

If this list is empty, the cloud operator must configure a pool of floating IP addresses.

2. To allocate a floating IP address to the current project:

```
$ nova floating-ip-create
+-----+-----+-----+-----+
| Ip           | Instance Id | Fixed Ip | Pool   |
+-----+-----+-----+-----+
| 172.24.4.226 | None        | None     | public |
+-----+-----+-----+-----+
```

By default, the floating IP address is allocated from the `public` pool. The command shows the allocated IP address.

If more than one IP address pool is available, you can specify the pool from which to allocate the address:

```
$ nova floating-ip-create POOL_NAME
```

3. To list floating IP addresses that are allocated to the current project:

```
$ nova floating-ip-list
```

Ip	Instance Id	Fixed Ip	Pool
172.24.4.225	4a60ff6a-7a3c-49d7-9515-86ae501044c6	10.0.0.2	public
172.24.4.226	None	None	public

For each floating IP address that is allocated to the current project, the command shows the floating IP address, the ID for the instance to which the floating IP address is assigned, the associated fixed IP address, and the pool from which the floating IP address was allocated.

4. To associate a floating IP address with an instance, first allocate that address to the current project:

```
$ nova floating-ip-create
```

Ip	Instance Id	Fixed Ip	Pool
172.24.4.226	None	None	public

List instances to get the instance ID:

```
$ nova list
```

ID	Name	Status	Task State
4a60ff6a-7a3c-49d7-9515-86ae501044c6	my-instance	ACTIVE	None
Running	private=10.0.0.2, 172.24.4.225		

Then, assign the floating IP address to the instance, as follows:

```
$ nova add-floating-ip my-instance 172.24.4.226
```

Notice that the instance is now associated with two floating IP addresses:

```
$ nova list
```

```

+-----+-----+-----+-----+
+-----+-----+-----+-----+
+
| ID                               | Name       | Status | Task State |
| Power State | Networks  |        |            |
+-----+-----+-----+-----+
+
| 4a60ff6a-7a3c-49d7-9515-86ae501044c6 | my-instance | ACTIVE | None       |
| Running      | private=10.0.0.2, 172.24.4.225, 172.24.4.226 |
+-----+-----+-----+-----+
+-----+-----+-----+-----+
+

```

To assign a fixed IP address to a floating IP address that you assign to an instance, add the fixed IP address as an optional parameter:

```
$ nova add-floating-ip --fixed-
address=FIXED_IP_ADDRESS INSTANCE_NAME_OR_ID FLOATING_IP_ADDRESS
```

After you assign the floating IP address and configure security group rules for the instance, the instance is publicly available at the floating IP address.

5. To release a floating IP address from the current project:

```
$ nova floating-ip-delete FLOATING_IP_ADDRESS
```

The floating IP address is returned to the floating IP address pool that is available to all projects. If a floating IP address is assigned to a running instance, it is automatically disassociated from that instance.

Launch and manage stacks

The Orchestration service provides a template-based orchestration engine for the OpenStack cloud, which can be used to create and manage cloud infrastructure resources such as storage, networking, instances, and applications as a repeatable running environment.

Templates are used to create stacks, which are collections of resources. For example, a stack might include instances, floating IPs, volumes, security groups, or users. The Orchestration service offers access to all OpenStack core services via a single modular template, with additional orchestration capabilities such as auto-scaling and basic high availability.

For information about the:

- Basic creation and deletion of Orchestration stacks, refer to the [End User Guide](#).
- `heat` CLI commands, see the [OpenStack Command Line Interface Reference](#)

As an administrator, you can also carry out stack functions on behalf of your users. For example, to resume, suspend, or delete a stack, run:

```
$ action-resume stackID
$ action-suspend stackID
$ stack-delete stackID
```

Manage quotas

To prevent system capacities from being exhausted without notification, you can set up quotas. Quotas are operational limits. For example, the number of gigabytes allowed for each tenant can be controlled so that cloud resources are optimized. Quotas can be enforced at both the tenant (or project) and the tenant-user level.

Using the command-line interface, you can manage quotas for the OpenStack Compute service, the OpenStack Block Storage service, and the OpenStack Networking service.

The cloud operator typically changes default values because a tenant requires more than ten volumes or 1 TB on a compute node.



Note

To view all tenants (projects), run:

```
$ keystone tenant-list
```

id	name	enabled
e66d97ac1b704897853412fc8450f7b9	admin	True
bf4a37b885fe46bd86e999e50adad1d3	services	True
21bd1c7c95234fd28f589b60903606fa	tenant01	True
f599c5cd1cba4125ae3d7caed08e288c	tenant02	True

To display all current users for a tenant, run:

```
$ keystone user-list --tenant-id tenantID
```

id	name	enabled	email
ea30aa434ab24a139b0e85125ec8a217	demo00	True	
4f8113c1d838467cad0c2f337b3dfded	demo01	True	

Manage Compute service quotas

As an administrative user, you can use the **nova quota-*** commands, which are provided by the **python-novaclient** package, to update the Compute service quotas for a specific tenant or tenant user, as well as update the quota defaults for a new tenant.

Table 2.4. Compute quota descriptions

Quota name	Description
cores	Number of instance cores (VCPUs) allowed per tenant.
fixed-ips	Number of fixed IP addresses allowed per tenant. This number must be equal to or greater than the number of allowed instances.
floating-ips	Number of floating IP addresses allowed per tenant.
injected-file-content-bytes	Number of content bytes allowed per injected file.
injected-file-path-bytes	Number of bytes allowed per injected file path.
injected-files	Number of injected files allowed per tenant.
instances	Number of instances allowed per tenant.

Quota name	Description
key-pairs	Number of key pairs allowed per user.
metadata-items	Number of metadata items allowed per instance.
ram	Megabytes of instance ram allowed per tenant.
security-groups	Number of security groups per tenant.
security-group-rules	Number of rules per security group.

View and update Compute quotas for a tenant (project)

To view and update default quota values

1. List all default quotas for all tenants, as follows:

```
$ nova quota-defaults
```

For example:

```
$ nova quota-defaults
+-----+-----+
| Quota          | Limit |
+-----+-----+
| instances      | 10    |
| cores          | 20    |
| ram            | 51200 |
| floating_ips   | 10    |
| fixed_ips      | -1    |
| metadata_items | 128   |
| injected_files | 5     |
| injected_file_content_bytes | 10240 |
| injected_file_path_bytes  | 255   |
| key_pairs      | 100   |
| security_groups| 10    |
| security_group_rules | 20    |
+-----+-----+
```

2. Update a default value for a new tenant, as follows:

```
$ nova quota-class-update --key value default
```

For example:

```
$ nova quota-class-update --instances 15 default
```

To view quota values for an existing tenant (project)

1. Place the tenant ID in a usable variable, as follows:

```
$ tenant=$(keystone tenant-list | awk '/tenantName/ {print $2}')
```

2. List the currently set quota values for a tenant, as follows:

```
$ nova quota-show --tenant $tenant
```

For example:

```
$ nova quota-show --tenant $tenant
+-----+-----+
| Quota          | Limit |
+-----+-----+
```

Quota	Limit
instances	10
cores	20
ram	51200
floating_ips	10
fixed_ips	-1
metadata_items	128
injected_files	5
injected_file_content_bytes	10240
injected_file_path_bytes	255
key_pairs	100
security_groups	10
security_group_rules	20

To update quota values for an existing tenant (project)

1. Obtain the tenant ID, as follows:

```
$ tenant=$(keystone tenant-list | awk '/tenantName/ {print $2}')
```

2. Update a particular quota value, as follows:

```
$ nova quota-update --quotaName quotaValue tenantID
```

For example:

```
$ nova quota-update --floating-ips 20 $tenant
$ nova quota-show --tenant $tenant
```

Quota	Limit
instances	10
cores	20
ram	51200
floating_ips	20
fixed_ips	-1
metadata_items	128
injected_files	5
injected_file_content_bytes	10240
injected_file_path_bytes	255
key_pairs	100
security_groups	10
security_group_rules	20



Note

To view a list of options for the **quota-update** command, run:

```
$ nova help quota-update
```

View and update Compute quotas for a tenant user

To view quota values for a tenant user

1. Place the user ID in a usable variable, as follows:

```
$ tenantUser=$(keystone user-list | awk '/userName/ {print $2}')
```

2. Place the user's tenant ID in a usable variable, as follows:

```
$ tenant=$(keystone tenant-list | awk '/tenantName/ {print $2}')
```

3. List the currently set quota values for a tenant user, as follows:

```
$ nova quota-show --user $tenantUser --tenant $tenant
```

For example:

```
$ nova quota-show --user $tenantUser --tenant $tenant
```

Quota	Limit
instances	10
cores	20
ram	51200
floating_ips	20
fixed_ips	-1
metadata_items	128
injected_files	5
injected_file_content_bytes	10240
injected_file_path_bytes	255
key_pairs	100
security_groups	10
security_group_rules	20

To update quota values for a tenant user

1. Place the user ID in a usable variable, as follows:

```
$ tenantUser=$(keystone user-list | awk '/userName/ {print $2}')
```

2. Place the user's tenant ID in a usable variable, as follows:

```
$ tenant=$(keystone tenant-list | awk '/tenantName/ {print $2}')
```

3. Update a particular quota value, as follows:

```
$ nova quota-update --user $tenantUser --quotaName quotaValue $tenant
```

For example:

```
$ nova quota-update --user $tenantUser --floating-ips 12 $tenant
$ nova quota-show --user $tenantUser --tenant $tenant
```

Quota	Limit
instances	10
cores	20
ram	51200
floating_ips	12
fixed_ips	-1
metadata_items	128
injected_files	5
injected_file_content_bytes	10240

injected_file_path_bytes	255
key_pairs	100
security_groups	10
security_group_rules	20



Note

To view a list of options for the **quota-update** command, run:

```
$ nova help quota-update
```

Manage Block Storage service quotas

As an administrative user, you can update the OpenStack Block Storage service quotas for a project. You can also update the quota defaults for a new project.

Table 2.5. Block Storage quotas

Property name	Defines the number of
gigabytes	Volume gigabytes allowed for each tenant.
snapshots	Volume snapshots allowed for each tenant.
volumes	Volumes allowed for each tenant.

View and update Block Storage service quotas

As an administrative user, you can view and update Block Storage service quotas.

1. List the default quotas for all projects, as follows:

```
$ cinder quota-defaults
```

Property	Value
gigabytes	1000
snapshots	10
volumes	10

2. To update a default value for a new project, update the property in the `/etc/cinder/cinder.conf` file.
3. View Block Storage service quotas for a project, as follows:

```
$ cinder quota-show TENANT_NAME
```

For example:

```
$ cinder quota-show tenant01
```

Property	Value
gigabytes	1000
snapshots	10

```
| volumes | 10 |
+-----+-----+
```

4. To update Block Storage service quotas, place the tenant ID in a usable variable, as follows:

```
$ tenant=$(keystone tenant-list | awk '/tenantName/ {print $2}')
```

5. Update a particular quota value, as follows:

```
$ cinder quota-update --quotaName NewValue tenantID
```

For example:

```
$ cinder quota-update --volumes 15 $tenant
```

```
$ cinder quota-show tenant01
```

```
+-----+-----+
| Property | Value |
+-----+-----+
| gigabytes | 1000 |
| snapshots | 10 |
| volumes   | 15 |
+-----+-----+
```

Manage Networking service quotas

A quota limits the number of available resources. A default quota might be enforced for all tenants. When you try to create more resources than the quota allows, an error occurs:

```
$ neutron net-create test_net
```

```
Quota exceeded for resources: ['network']
```

Per-tenant quota configuration is also supported by the quota extension API. See [Per-tenant quota configuration](#) for details.

Basic quota configuration

In the Networking default quota mechanism, all tenants have the same quota values, such as the number of resources that a tenant can create.

The quota value is defined in the OpenStack Networking `neutron.conf` configuration file. To disable quotas for a specific resource, such as network, subnet, or port, remove a corresponding item from `quota_items`. This example shows the default quota values:

```
[quotas]
# resource name(s) that are supported in quota features
quota_items = network,subnet,port

# number of networks allowed per tenant, and minus means unlimited
quota_network = 10

# number of subnets allowed per tenant, and minus means unlimited
quota_subnet = 10

# number of ports allowed per tenant, and minus means unlimited
```

```
quota_port = 50

# default driver to use for quota checks
quota_driver = neutron.quota.ConfDriver
```

OpenStack Networking also supports quotas for L3 resources: router and floating IP. Add these lines to the `quotas` section in the `neutron.conf` file.

```
[quotas]
# number of routers allowed per tenant, and minus means unlimited
quota_router = 10

# number of floating IPs allowed per tenant, and minus means unlimited
quota_floatingip = 50
```



Note

The `quota_items` option does not affect these quotas.

OpenStack Networking also supports quotas for security group resources: number of security groups and the number of rules for each security group. Add these lines to the `quotas` section in the `neutron.conf` file:

```
[quotas]
# number of security groups per tenant, and minus means unlimited
quota_security_group = 10

# number of security rules allowed per tenant, and minus means unlimited
quota_security_group_rule = 100
```



Note

The `quota_items` option does not affect these quotas.

Configure per-tenant quotas

OpenStack Networking also supports per-tenant quota limit by quota extension API.

Use these commands to manage per-tenant quotas:

- **neutron quota-delete.** Deletes defined quotas for a specified tenant.
- **neutron quota-list.** Lists defined quotas for all tenants.
- **neutron quota-show.** Shows quotas for a specified tenant.
- **neutron quota-update.** Updates quotas for a specified tenant.

Only users with the `admin` role can change a quota value. By default, the default set of quotas are enforced for all tenants, so no **quota-create** command exists.

1. Configure Networking to show per-tenant quotas

Set the `quota_driver` option in the `neutron.conf` file:

```
quota_driver = neutron.db.quota_db.DbQuotaDriver
```

When you set this option, the output for Networking commands shows `quotas`.

2. List Networking extensions

To list the Networking extensions, run this command:

```
$ neutron ext-list -c alias -c name
```

The command shows the `quotas` extension, which provides per-tenant quota management support:

alias	name
agent_scheduler	Agent Schedulers
security-group	security-group
binding	Port Binding
quotas	Quota management support
agent	agent
provider	Provider Network
router	Neutron L3 Router
lbaas	LoadBalancing service
extraroute	Neutron Extra Route

3. Show information for the quotas extension

To show information for the `quotas` extension, run this command:

```
$ neutron ext-show quotas
```

Field	Value
alias	quotas
description	Expose functions for quotas management per tenant
links	
name	Quota management support
namespace	http://docs.openstack.org/network/ext/quotas-sets/api/v2.0
updated	2012-07-29T10:00:00-00:00



Note

Only some plug-ins support per-tenant quotas. Specifically, Open vSwitch, Linux Bridge, and VMware NSX support them, but new versions of other plug-ins might bring additional functionality. See the documentation for each plug-in.

4. List tenants who have per-tenant quota support

The **quota-list** command lists tenants for which the per-tenant quota is enabled. The command does not list tenants with default quota support. You must be an administrative user to run this command:

```
$ neutron quota-list
```

```
+-----+-----+-----+-----+-----+
+-----+
| floatingip | network | port | router | subnet | tenant_id |
|           |         |     |       |        |           |
+-----+-----+-----+-----+-----+
|           20 |         5 |    20 |      10 |        5 |
| 6f88036c45344d9999a1f971e4882723 |
|           25 |        10 |    30 |      10 |       10 |
| bff5c9455ee24231b5bc713c1b96d422 |
+-----+-----+-----+-----+-----+
+-----+
```

5. Show per-tenant quota values

The **quota-show** reports the current set of quota limits for the specified tenant. Non-administrative users can run this command without the `--tenant_id` parameter. If per-tenant quota limits are not enabled for the tenant, the command shows the default set of quotas:

```
$ neutron quota-show --tenant_id 6f88036c45344d9999a1f971e4882723
```

```
+-----+-----+
| Field      | Value |
+-----+-----+
| floatingip | 20    |
| network    | 5     |
| port       | 20    |
| router     | 10    |
| subnet     | 5     |
+-----+-----+
```

The following command shows the command output for a non-administrative user:

```
$ neutron quota-show
```

```
+-----+-----+
| Field      | Value |
+-----+-----+
| floatingip | 20    |
| network    | 5     |
| port       | 20    |
| router     | 10    |
| subnet     | 5     |
+-----+-----+
```

6. Update quota values for a specified tenant

Use the **quota-update** command to update a quota for a specified tenant:

```
$ neutron quota-update --tenant_id 6f88036c45344d9999a1f971e4882723 --
network 5
```


Field	Value
floatingip	50
network	5
port	50
router	10
subnet	10

You can update quotas for multiple resources through one command:

```
$ neutron quota-update --tenant_id 6f88036c45344d9999a1f971e4882723 --
subnet 5 --port 20
```

Field	Value
floatingip	50
network	5
port	20
router	10
subnet	5

To update the limits for an L3 resource such as, router or floating IP, you must define new values for the quotas after the `--` directive.

This example updates the limit of the number of floating IPs for the specified tenant:

```
$ neutron quota-update --tenant_id 6f88036c45344d9999a1f971e4882723 -- --
floatingip 20
```

Field	Value
floatingip	20
network	5
port	20
router	10
subnet	5

You can update the limits of multiple resources by including L2 resources and L3 resource through one command.

```
$ neutron quota-update --tenant_id 6f88036c45344d9999a1f971e4882723 --
network 3 --subnet 3 --port 3 -- --floatingip 3 --router 3
```

Field	Value
floatingip	3
network	3
port	3
router	3
subnet	3

7. Delete per-tenant quota values

To clear per-tenant quota limits, use the **quota-delete** command:

```
$ neutron quota-delete --tenant_id 6f88036c45344d9999a1f971e4882723
```

```
Deleted quota: 6f88036c45344d9999a1f971e4882723
```

After you run this command, you can see that quota values for the tenant are reset to the default values:

```
$ neutron quota-show --tenant_id 6f88036c45344d9999a1f971e4882723
```

Field	Value
floatingip	50
network	10
port	50
router	10
subnet	10

Analyze log files

Use the swift command-line client to analyze log files.

The swift client is simple to use, scalable, and flexible.

Use the swift client `-o` or `-output` option to get short answers to questions about logs,

You can use the `-o` `-output` option with a single object download to redirect the command output to a specific file or to STDOUT (-). The ability to redirect the output to STDOUT enables you to pipe (|) data without saving it to disk first.

Upload and analyze log files

1. This example assumes that `logtest` directory contains the following log files:

Example 2.1. Example files

```
2010-11-16-21_access.log
2010-11-16-22_access.log
2010-11-15-21_access.log
2010-11-15-22_access.log
```

Each file uses the following line format:

Example 2.2. Log line format

```
Nov 15 21:53:52 lucid64 proxy-server - 127.0.0.1 15/Nov/2010/
22/53/52 DELETE /v1/AUTH_cd4f57824deb4248a533f2c28bf156d3/
2eefc05599d44df38a7f18b0b42ffedd HTTP/1.0 204 - \
- test%3Atester%2CAUTH_tkcdab3c6296e249d7b7e2454ee57266ff - - -
txaba5984c-aac7-460e-b04b-afc43f0c6571 - 0.0432
```

2. Change into the `logtest` directory:

```
$ cd logtest
```

3. Upload the log files into the `logtest` container:

```
$ swift -A http://swift-auth.com:11000/v1.0 -U test:tester -K testing
upload logtest *.log
```

```
2010-11-16-21_access.log
2010-11-16-22_access.log
2010-11-15-21_access.log
2010-11-15-22_access.log
```

4. Get statistics for the account:

```
$ swift -A http://swift-auth.com:11000/v1.0 -U test:tester -K testing -q
stat
```

```
Account: AUTH_cd4f57824deb4248a533f2c28bf156d3
Containers: 1
Objects: 4
Bytes: 5888268
```

5. Get statistics for the logtest container:

```
$ swift -A http://swift-auth.com:11000/v1.0 -U test:tester -K testing stat logtest
```

```
Account: AUTH_cd4f57824deb4248a533f2c28bf156d3
Container: logtest
Objects: 4
Bytes: 5864468
Read ACL:
Write ACL:
```

6. List all objects in the logtest container:

```
$ swift -A http://swift-auth.com:11000/v1.0 -U test:tester -K testing list logtest
```

```
2010-11-15-21_access.log
2010-11-15-22_access.log
2010-11-16-21_access.log
2010-11-16-22_access.log
```

Download and analyze an object

This example uses the `-o` `--output` option and a hyphen (`-`) to get information about an object.

Use the `swift download` command to download the object. On this command, stream the output to `awk` to break down requests by return code and the date 2200 on November 16th, 2010.

Using the log line format, find the request type in column 9 and the return code in column 12.

After `awk` processes the output, it pipes it to `sort` and `uniq -c` to sum up the number of occurrences for each request type and return code combination.

1. Download an object:

```
$ swift -A http://swift-auth.com:11000/v1.0 -U test:tester -K testing \
  download -o - logtest 2010-11-16-22_access.log | awk '{ print
  $9"--"$12}' | sort | uniq -c
```

```
805 DELETE-204
12 DELETE-404
2 DELETE-409
723 GET-200
142 GET-204
74 GET-206
80 GET-304
34 GET-401
5 GET-403
18 GET-404
166 GET-412
2 GET-416
50 HEAD-200
17 HEAD-204
20 HEAD-401
8 HEAD-404
```

```

30 POST-202
25 POST-204
22 POST-400
6 POST-404
842 PUT-201
2 PUT-202
32 PUT-400
4 PUT-403
4 PUT-404
2 PUT-411
6 PUT-412
6 PUT-413
2 PUT-422
8 PUT-499

```

2. Discover how many PUT requests are in each log file.

Use a bash for loop with `awk` and `swift` with the `-o` `--output` option and a hyphen (`-`) to discover how many PUT requests are in each log file.

Run the `swift list` command to list objects in the `logtest` container. Then, for each item in the list, run the `swift download -o -` command. Pipe the output into `grep` to filter the PUT requests. Finally, pipe into `wc -l` to count the lines.

```

$ for f in `swift -A http://swift-auth.com:11000/v1.0 -U test:tester -K
testing list logtest` ; \
do echo -ne "PUTS - " ; swift -A http://swift-auth.com:11000/v1.
0 -U test:tester -K testing download -o - logtest $f | grep PUT | wc -l ; \
done

```

```

2010-11-15-21_access.log - PUTS - 402
2010-11-15-22_access.log - PUTS - 1091
2010-11-16-21_access.log - PUTS - 892
2010-11-16-22_access.log - PUTS - 910

```

3. List the object names that begin with a specified string.

Run the `swift list -p 2010-11-15` command to list objects in the `logtest` container that begin with the `2010-11-15` string.

For each item in the list, run the `swift download -o -` command.

Pipe the output to `grep` and `wc`. Use the `echo` command to display the object name.

```

$ for f in `swift -A http://swift-auth.com:11000/v1.0 -U test:tester -K
testing list -p 2010-11-15 logtest` ; \
do echo -ne "$f - PUTS - " ; swift -A http://127.0.0.1:11000/v1.0
-U test:tester \
-K testing download -o - logtest $f | grep PUT | wc -l ; \
done

```

```

2010-11-15-21_access.log - PUTS - 402
2010-11-15-22_access.log - PUTS - 910

```

Appendix A. Community support

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Many resources are available to help you run and use OpenStack. Members of the OpenStack community can answer questions and help with bug suspicions. We are constantly improving and adding to the main features of OpenStack, but if you have any problems, do not hesitate to ask. Use the following resources to get OpenStack support and troubleshoot your existing installations.

Documentation

For the available OpenStack documentation, see docs.openstack.org.

To provide feedback on documentation, join and use the `<openstack-docs@lists.openstack.org>` mailing list at [OpenStack Documentation Mailing List](#), or [report a bug](#).

The following books explain how to install an OpenStack cloud and its associated components:

- [Installation Guide for Debian 7.0](#)
- [Installation Guide for openSUSE and SUSE Linux Enterprise Server](#)
- [Installation Guide for Red Hat Enterprise Linux, CentOS, and Fedora](#)
- [Installation Guide for Ubuntu 12.04 \(LTS\)](#)

The following books explain how to configure and run an OpenStack cloud:

- [Cloud Administrator Guide](#)
- [Configuration Reference](#)
- [Operations Guide](#)
- [High Availability Guide](#)
- [Security Guide](#)
- [Virtual Machine Image Guide](#)

The following books explain how to use the OpenStack dashboard and command-line clients:

- [API Quick Start](#)
- [End User Guide](#)
- [Admin User Guide](#)
- [Command-Line Interface Reference](#)

The following documentation provides reference and guidance information for the OpenStack APIs:

- [OpenStack API Reference](#)
- [OpenStack Block Storage Service API v2 Reference](#)
- [OpenStack Compute API v2 and Extensions Reference](#)
- [OpenStack Identity Service API v2.0 Reference](#)
- [OpenStack Image Service API v2 Reference](#)
- [OpenStack Networking API v2.0 Reference](#)
- [OpenStack Object Storage API v1 Reference](#)

The [Training Guides](#) offer software training for cloud administration and management.

ask.openstack.org

During the set up or testing of OpenStack, you might have questions about how a specific task is completed or be in a situation where a feature does not work correctly. Use the ask.openstack.org site to ask questions and get answers. When you visit the <http://ask.openstack.org> site, scan the recently asked questions to see whether your question has already been answered. If not, ask a new question. Be sure to give a clear, concise summary in the title and provide as much detail as possible in the description. Paste in your command output or stack traces, links to screen shots, and so on.

OpenStack mailing lists

A great way to get answers and insights is to post your question or problematic scenario to the OpenStack mailing list. You can learn from and help others who might have similar issues. To subscribe or view the archives, go to <http://lists.openstack.org/cgi-bin/mailman/listinfo/openstack>. You might be interested in the other mailing lists for specific projects or development, which you can find [on the wiki](#). A description of all mailing lists is available at <http://wiki.openstack.org/MailingLists>.

The OpenStack wiki

The [OpenStack wiki](#) contains a broad range of topics but some of the information can be difficult to find or is a few pages deep. Fortunately, the wiki search feature enables you to

search by title or content. If you search for specific information, such as about networking or nova, you can find lots of relevant material. More is being added all the time, so be sure to check back often. You can find the search box in the upper right corner of any OpenStack wiki page.

The Launchpad Bugs area

The OpenStack community values your set up and testing efforts and wants your feedback. To log a bug, you must sign up for a Launchpad account at <https://launchpad.net/+login>. You can view existing bugs and report bugs in the Launchpad Bugs area. Use the search feature to determine whether the bug has already been reported or even better, already fixed. If it still seems like your bug is unreported, fill out a bug report.

Some tips:

- Give a clear, concise summary!
- Provide as much detail as possible in the description. Paste in your command output or stack traces, links to screen shots, and so on.
- Be sure to include the software and package versions that you are using, especially if you are using a development branch, such as, "Grizzly release" vs git commit `bc79c3ecc55929bac585d04a03475b72e06a3208`.
- Any deployment specific information is helpful, such as Ubuntu 12.04 or multi-node install.

The Launchpad Bugs areas are available here:

- [Bugs: OpenStack Block Storage \(cinder\)](#)
- [Bugs: OpenStack Compute \(nova\)](#)
- [Bugs: OpenStack Dashboard \(horizon\)](#)
- [Bugs: OpenStack Identity \(keystone\)](#)
- [Bugs: OpenStack Image Service \(glance\)](#)
- [Bugs: OpenStack Networking \(neutron\)](#)
- [Bugs: OpenStack Object Storage \(swift\)](#)
- [Bugs: Bare Metal \(ironic\)](#)
- [Bugs: Data Processing Service \(sahara\)](#)
- [Bugs: Database Service \(trove\)](#)
- [Bugs: Orchestration \(heat\)](#)
- [Bugs: Telemetry \(ceilometer\)](#)
- [Bugs: Queue Service \(marconi\)](#)

- [Bugs: OpenStack API Documentation \(api.openstack.org\)](http://api.openstack.org)
- [Bugs: OpenStack Documentation \(docs.openstack.org\)](http://docs.openstack.org)

The OpenStack IRC channel

The OpenStack community lives and breathes in the #openstack IRC channel on the Freenode network. You can hang out, ask questions, or get immediate feedback for urgent and pressing issues. To install an IRC client or use a browser-based client, go to <http://webchat.freenode.net/>. You can also use Colloquy (Mac OS X, <http://colloquy.info/>), mIRC (Windows, <http://www.mirc.com/>), or XChat (Linux). When you are in the IRC channel and want to share code or command output, the generally accepted method is to use a Paste Bin. The OpenStack project has one at <http://paste.openstack.org>. Just paste your longer amounts of text or logs in the web form and you get a URL you can paste into the channel. The OpenStack IRC channel is: #openstack on irc.freenode.net. You can find a list of all OpenStack-related IRC channels at <https://wiki.openstack.org/wiki/IRC>.

Documentation feedback

To provide feedback on documentation, join and use the <openstack-docs@lists.openstack.org> mailing list at [OpenStack Documentation Mailing List](#), or [report a bug](#).

OpenStack distribution packages

The following Linux distributions provide community-supported packages for OpenStack:

- **Debian:** <http://wiki.debian.org/OpenStack>
- **CentOS, Fedora, and Red Hat Enterprise Linux:** <http://openstack.redhat.com/>
- **openSUSE and SUSE Linux Enterprise Server:** <http://en.opensuse.org/Portal:OpenStack>
- **Ubuntu:** <https://wiki.ubuntu.com/ServerTeam/CloudArchive>