Creating new Kubernetes clusters

By employing OpenStack Magnum you can easily create Kubernetes clusters over OpenStack, using either the Cleura Cloud Management Panel or the OpenStack CLI. Let us demonstrate the creation of a Kubernetes cluster following both approaches.

Prerequisites

First and foremost, you need an account in Cleura Cloud. If you prefer to work with the OpenStack CLI, go ahead and enable it first. Then, in addition to the Python `openstackclient` module, make sure you also install the corresponding plugin module for Magnum. Use either the package manager of your operating system or `pip`:

Debian/Ubuntu	**Mac OS X with Homebrew**	**Python Package**
apt install python3-magnumclient		

This Python module is unavailable via `brew`, but you can install it via `pip`:

Creating a Kubernetes cluster

pip install python-magnumclient

To create a Kubernetes cluster from the Cleura Cloud Management Panel, fire up your favorite web browser, navigate to the Cleura Cloud page, and log into your account. On the other hand, if you prefer to work with the OpenStack CLI, don't forget to source the RC file first.

On the top right-hand side of the Cleura Cloud Management Panel, click the *Create* button. A new

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Dashboard

Compute ⌄

Networking ⌄

Storage ⌄

Images ⌄

Security Groups

Orchestration

Kubernetes ⌄

Logs ⌄

Users ⌄

Invoices

Support

API
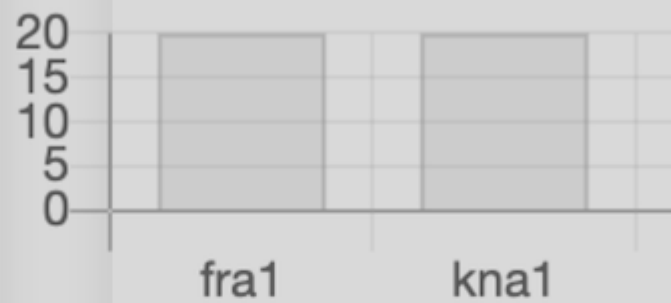
Monitoring ⌄

Cores (0 used) ⓘ

```
20
15
10
 5
 0
    fra1      kna1
```

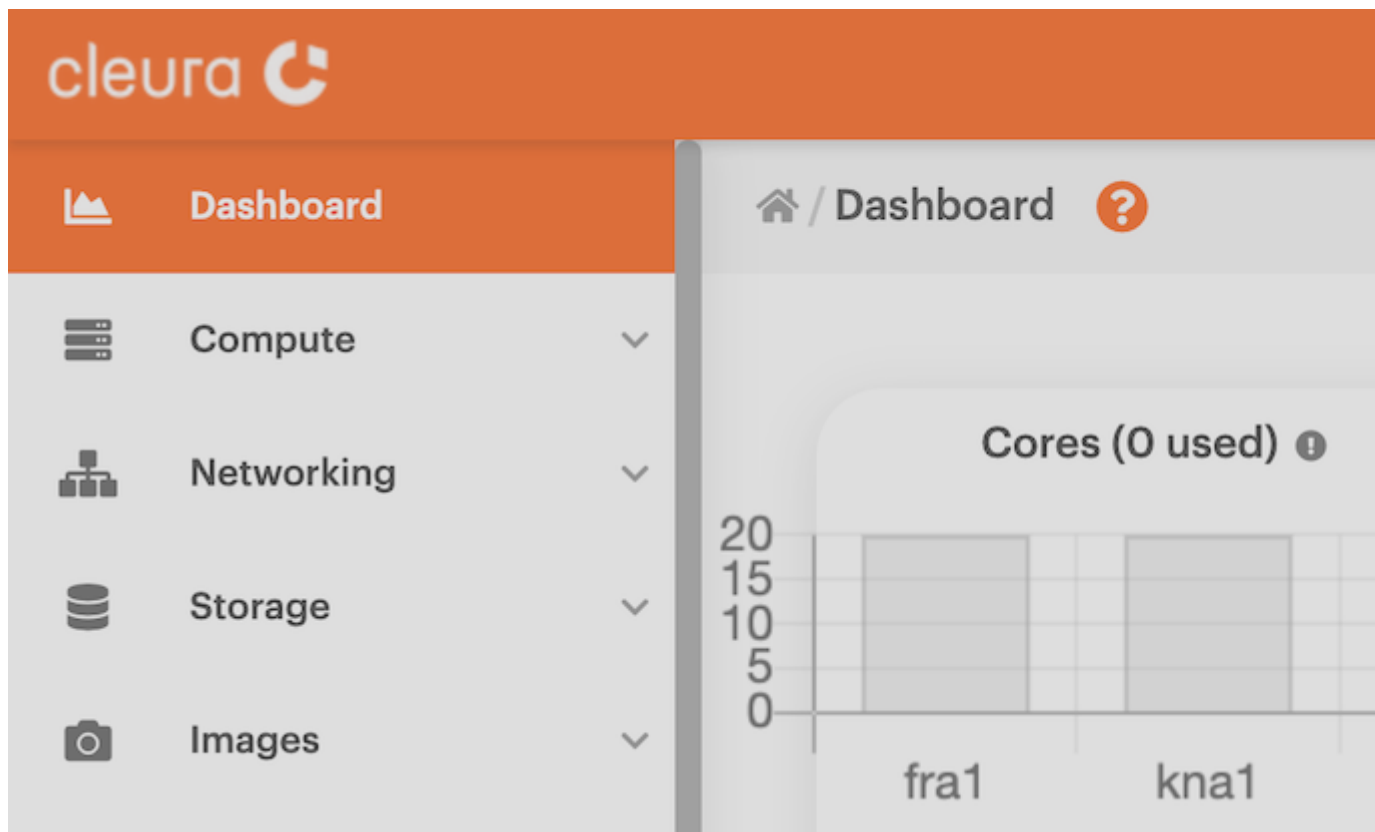☐ Show Quota

Create a Server

Operating systems

No servers defined

Alerts (last 24H)

You will notice several rounded boxes on that pane. Go ahead and click the one labeled *Magnum C*

Then, select one of the available templates to base the new cluster on. In the example below, we ha about to be deployed, the characteristics of the cluster nodes, the operating system they run, and t

	Images	⌄
	Security Groups	
	Orchestration	
	Kubernetes	⌄
	Logs	⌄
	Users	⌄
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	Support	
	API	
	Monitoring	⌄

«

5
0

fra1   kna1

Show Quota

Create a Server

Operating systems

No servers defined

Alerts (last 24H)
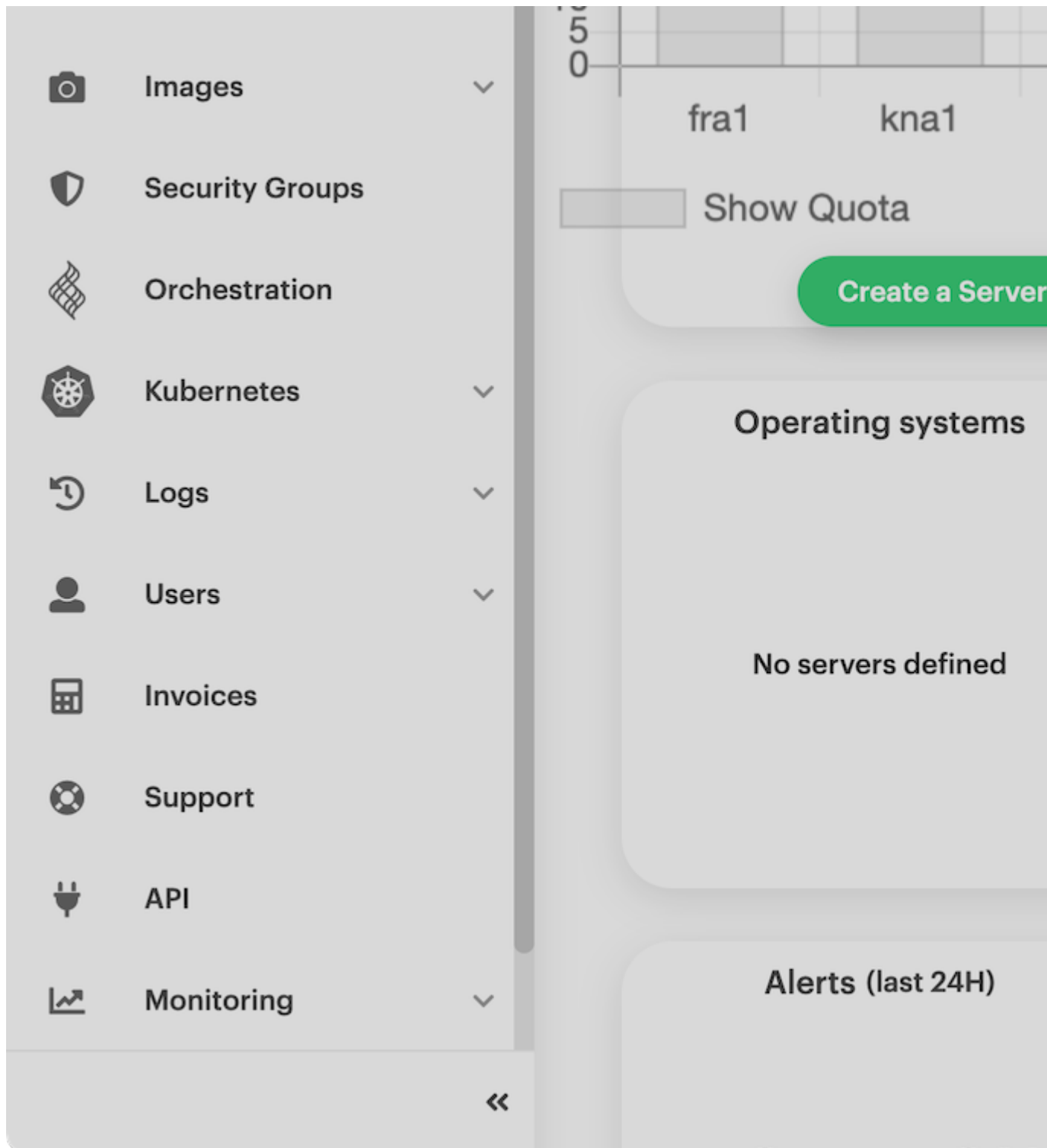
For now, you may skip the *Advanced Option* section. Click the green *Create* button, and Magnum w

A simple, general command for creating a new Kubernetes cluster with Magnum looks like this:

```
openstack coe cluster create \
    --cluster-template $CLUSTER_TMPL \
    --keypair $KEYPAIR \
    $CLUSTER_NAME
```

Let us list all available templates in the region:

```
openstack coe cluster template list
```

```
+----------------------------------+-----------------------------------------------------------+------+
| uuid                             | name                                                      | tags |
+----------------------------------+-----------------------------------------------------------+------+
| 3f476f01-b3de-4687-a188-6829ed947db0 | Kubernetes 1.15.5 on Fedora-atomic 29 4C-8GB-20GB No Master LB
| c458f02d-54b0-4ef8-abbc-e1c25b61165a | Kubernetes 1.15.5 on Fedora-atomic 29 2C-4GB-20GB No Master LB |
| f9e1a2ea-b1ff-43e7-8d1e-6dd5861b82cf | Kubernetes 1.18.6 on Fedora-coreos 33 2C-4GB-20GB No Master LB | 
+----------------------------------+-----------------------------------------------------------+------+
```

Select the template you want by setting the corresponding `uuid` value to the `CLUSTER_TMPL` variab

```
CLUSTER_TMPL="f9e1a2ea-b1ff-43e7-8d1e-6dd5861b82cf" # just an example
```

Then, list all available keypairs…

```
openstack keypair list
```

```
+---------+-----------------------------------------------+------+
| Name    | Fingerprint                                   | Type |
+---------+-----------------------------------------------+------+
| husavik | 34:3b:58:ba:ec:95:f5:17:17:df:04:38:11:89:e6:3d | ssh  |
+---------+-----------------------------------------------+------+
```

…and set the `KEYPAIR` variable to the name of the keypair you want:

```
KEYPAIR="husavik" # again, this is just an example
```

Finally, decide on a name for your new Kubernetes cluster:

```
CLUSTER_NAME="bangor"
```

With everything in place, go ahead and create your new Kubernetes cluster:

```
openstack coe cluster create \
    --cluster-template $CLUSTER_TMPL \
    --keypair husavik
    bangor
```

If everything went well with your request for a new cluster, on your terminal, you would see a mess

```
Request to create cluster e0df8c62-c6f6-4c7d-b67e-33e3606e9ab6 accepted
```

The cluster creation process takes some time to complete, and while you are waiting, you can che

```
openstack coe cluster list -c status
```

If everything is going well, the message you will get will be `CREATE_IN_PROGRESS`. When Magnum

Viewing the Kubernetes cluster

After the Kubernetes cluster is ready, you may at any time view it and get detailed information about it.

In the left vertical pane of the Cleura Cloud Management Panel, click through *Kubernetes*, *Magnum*

Click on the three-dot icon on the right of the cluster you want to inspect, and select *View details*.

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	Dashboard
	Compute	⌄
	Networking	⌄
	Storage	⌄
	Images	⌄
	Security Groups
	Orchestration
	Kubernetes	⌃
	Get started

To list all available Kubernetes clusters, just type:

```
openstack coe cluster list
```

```
+---------------+--------+---------+------------+--------------+---------------+---------------+
| uuid          | name   | keypair | node_count | master_count | status        | health_status |
+---------------+--------+---------+------------+--------------+---------------+---------------+
| e0df8c62-c6f6 | bangor | husavik |         1 |           1 | CREATE_COMPLE | HEALTHY       |
| -4c7d-b67e-33 |        |         |            |             | TE            |               |
| e3606e9ab6    |        |         |            |             |               |               |
+---------------+--------+---------+------------+--------------+---------------+---------------+
```

For many more details on a specific cluster, note its name and run a command like this:

```
openstack coe cluster show bangor
```

```
+---------------------+------------------------------------------------------------------------+
| Field               | Value                                                                  |
+---------------------+------------------------------------------------------------------------+
| status              | CREATE_COMPLETE                                                        |
| health_status       | HEALTHY                                                                |
| cluster_template_id | f9e1a2ea-b1ff-43e7-8d1e-6dd5861b82cf                                  |
| node_addresses      | ['185.52.156.105']                                                    |
| uuid                | e0df8c62-c6f6-4c7d-b67e-33e3606e9ab6                                  |
| stack_id            | e3725aed-f665-4e8d-9409-85f5ee5e2f4a                                  |
| status_reason       | None                                                                   |
| created_at          | 2022-11-14T07:32:02+00:00                                             |
| updated_at          | 2022-11-14T07:37:26+00:00                                             |
| coe_version         | v1.18.6                                                                |
| labels              | {'kube_tag': 'v1.18.6', 'heat_container_agent_tag': 'train-stable'}   |
| labels_overridden   | {}                                                                     |
| labels_skipped      | {}                                                                     |
| labels_added        | {}                                                                     |
| fixed_network       | None                                                                   |
| fixed_subnet        | None                                                                   |
| floating_ip_enabled | True                                                                   |
| faults              |                                                                        |
| keypair             | husavik                                                                |
| api_address         | https://89.46.80.136:6443                                             |
| master_addresses    | ['89.46.80.136']                                                      |
| master_lb_enabled   | False                                                                  |
| create_timeout      | 60                                                                     |
| node_count          | 1                                                                      |
| discovery_url       | https://discovery.etcd.io/23af721dc3ee773d2674db4881ff70cb            |
| docker_volume_size  | 50                                                                     |
| master_count        | 1                                                                      |
| container_version   | 1.12.6                                                                 |
| name                | bangor                                                                 |
| master_flavor_id    | 2C-4GB-20GB                                                            |
| flavor_id           | 2C-4GB-20GB                                                            |
| health_status_reason | {'bangor-id6nijycp2wy-master-0.Ready': 'True', 'bangor-id6nijycp2wy- |
|                     | node-0.Ready': 'True', 'api': 'ok'}                                    |
```

```
| project_id        | dfc700467396428bacba4376e72cc3e9                       |
+-------------------+--------------------------------------------------------+
```

Accessing the Kubernetes cluster with kubectl

You may install the Kubernetes command line tool, `kubectl`, on your local computer, and run commands against your cluster. To install `kubectl`, use the package manager of your operating system.

Debian/Ubuntu   **Mac OS X with Homebrew**

```
apt
install
kubectl
```

```
brew
install
kubectl
```
ning commands against a specific cluster, you must have the ding `config` file on your computer.

Cleura Cloud Management Panel   **OpenStack CLI**

Downloading a `config` file from the Cleura Cloud Management Panel is currently not supported. You can still fetch the `config` file of your newly created Kubernetes cluster using the OpenStack CLI.

To download the `config` file for your Kubernetes cluster, type

the
following:

```
openstack
coe
cluster
config --
dir=$
bangor
```

the `config` file locally, set the value of variable `KUBECONFIG` to the
e file. Type, for example:

```
export KUBECONFIG=${PWD}/config
```

Then, you can use `kubectl` to run commands against your cluster. See, for
instance, all cluster nodes…

```
kubectl get nodes
```

```
NAME                      STATUS  ROLES   AGE    VERSION
bangor-id6nijycp2wy-master-0  Ready   master  113m   v1.18.6
bangor-id6nijycp2wy-node-0    Ready   <none>  111m   v1.18.6
```

…or all running pods in every namespace:

```
kubectl get pods --all-namespaces
```

```
NAMESPACE    NAME                            READY  STATUS   RESTARTS  AGE
kube-system  coredns-786ffb7797-tw2hg             1/1    Running  0       167m
kube-system  coredns-786ffb7797-vbqwn             1/1    Running  0       167m
kube-system  csi-cinder-controllerplugin-0        5/5    Running  0      167m
kube-system  csi-cinder-nodeplugin-4nr69          2/2    Running  0       166m
kube-system  csi-cinder-nodeplugin-vtwqf          2/2    Running  0       167m
kube-system  dashboard-metrics-scraper-6b4884c9d5-4mlrg 1/1  Running  0       167m
kube-system  k8s-keystone-auth-wk5v2              1/1    Running  0       167m
kube-system  kube-dns-autoscaler-75859754fd-2wsd9    1/1    Running  0      167m
kube-system  kube-flannel-ds-7z9dp              1/1    Running  0      167m
kube-system  kube-flannel-ds-dmvk6              1/1    Running  0       166m
kube-system  kubernetes-dashboard-c98496485-stn42    1/1    Running  0       167m
kube-system  magnum-metrics-server-79556d6999-xdlpm   1/1    Running  0       167m
kube-system  npd-5p6gk                     1/1    Running  0       165m
kube-system  openstack-cloud-controller-manager-44rz9  1/1    Running  0       167m
```