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

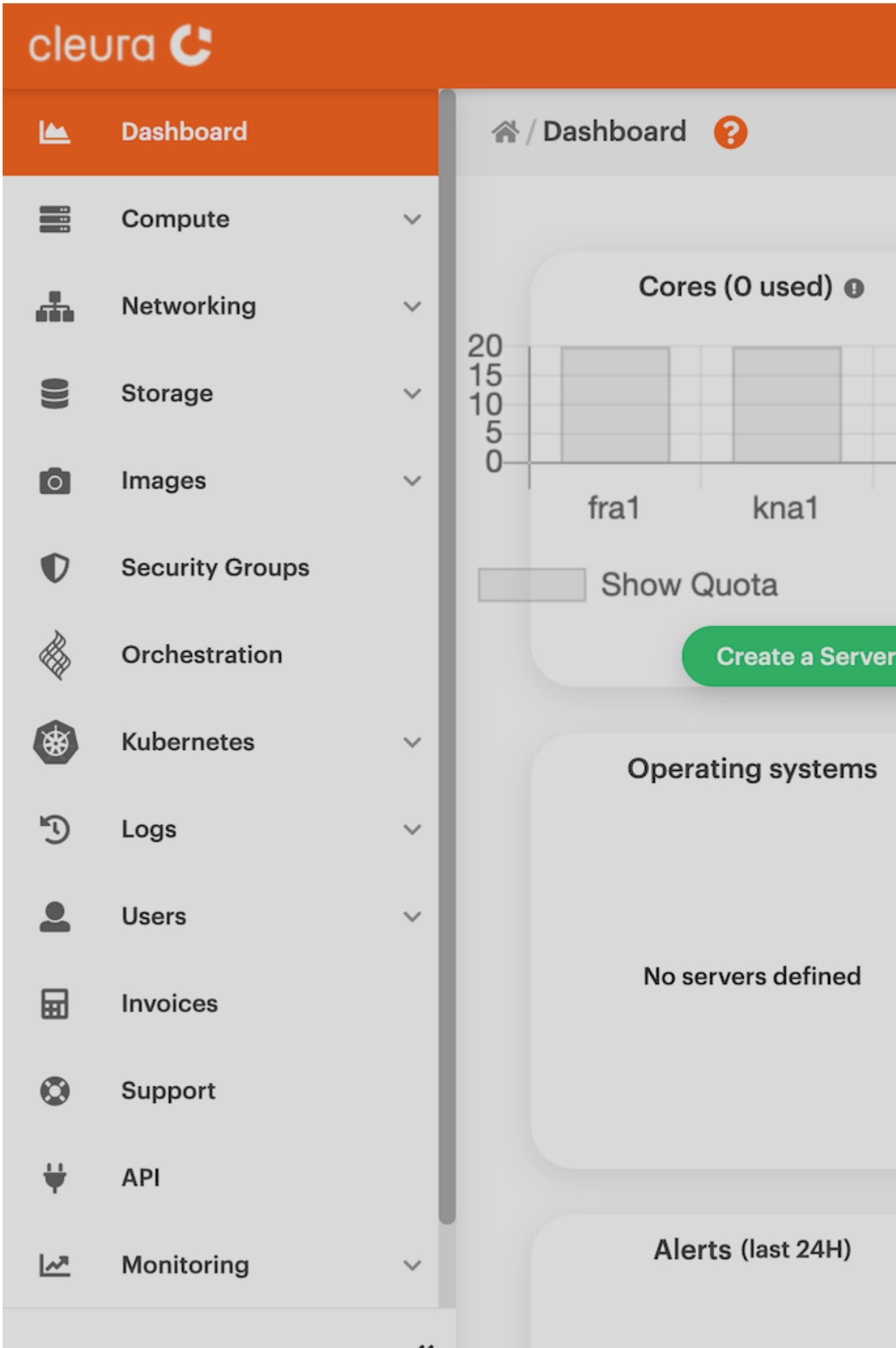
First and foremost, you need an account in Cleura Cloud. If you prefer to work with the OpenStack CLI, go ahead and enable it first. Then, in addition to the Python `openstackclient` module, make sure you also install the corresponding plugin module for Magnum. Use either the package manager of your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

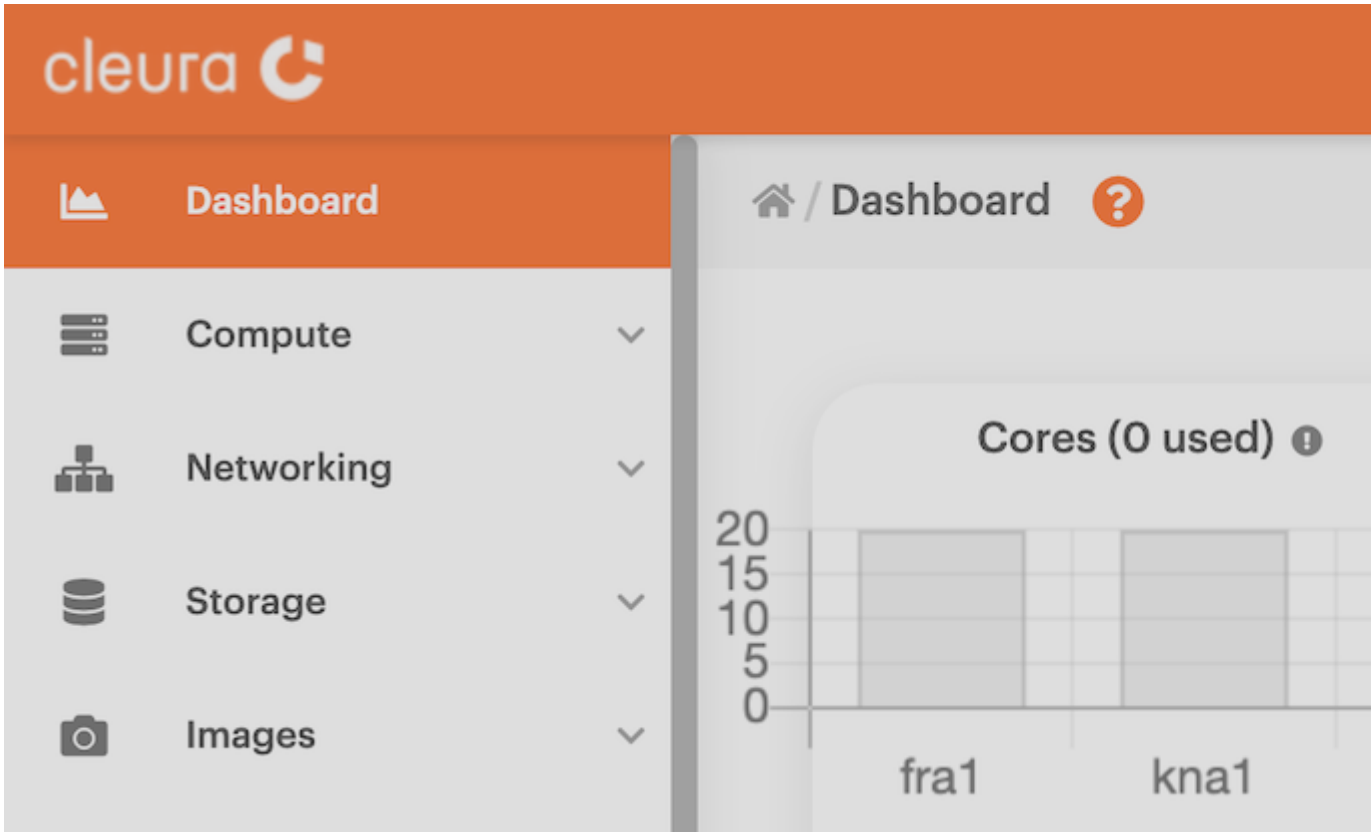
Creating a Kubernetes cluster

To create a Kubernetes cluster from the Cleura Cloud Management Panel, fire up your web browser, navigate to the Cleura Cloud Management Panel start page and log in to your Cleura Cloud account. On the other hand, if you prefer to work with the OpenStack CLI, please do not forget to source the RC file first.

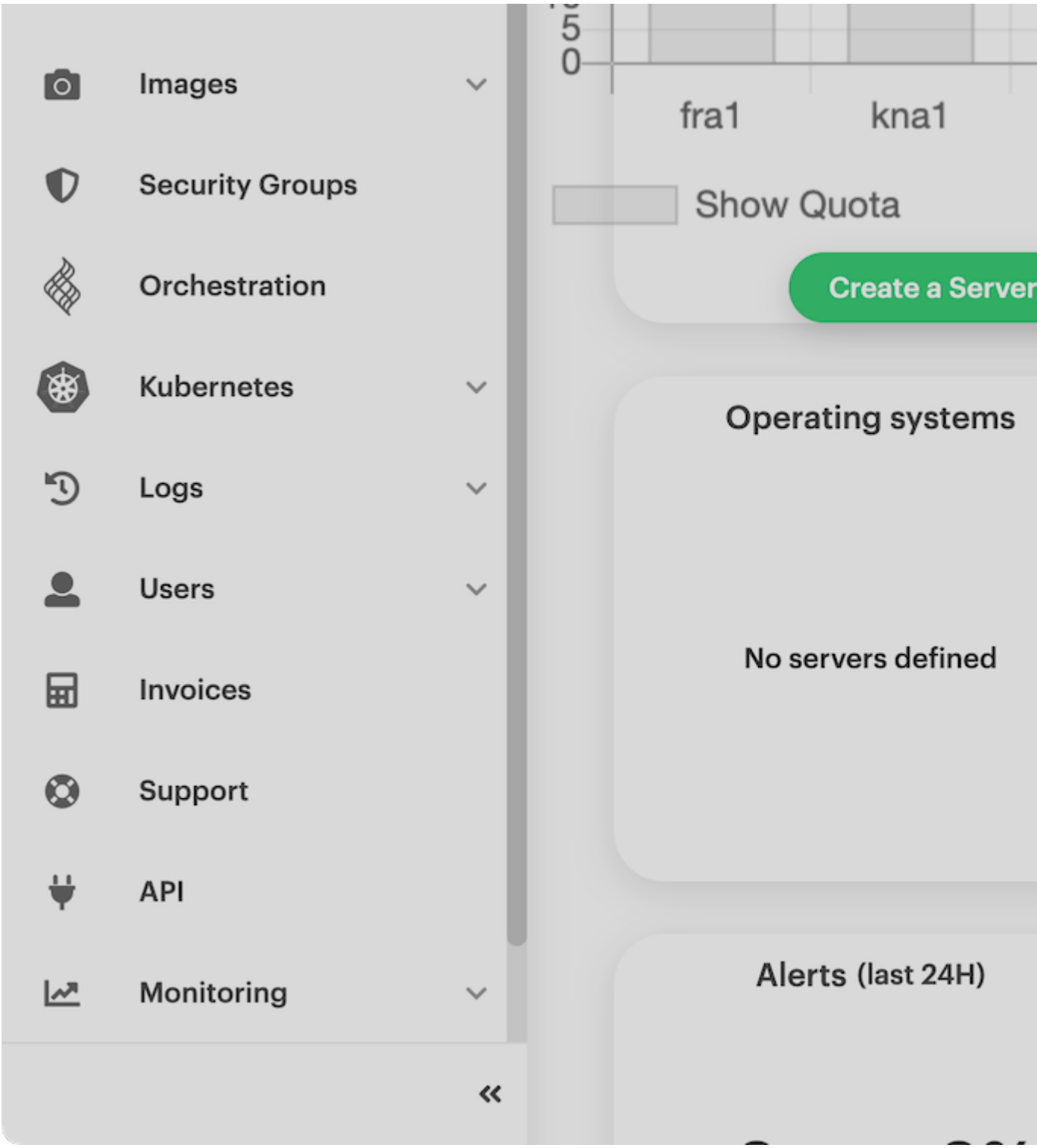
On the top right-hand side of the Cleura Cloud Management Panel, click the *Create* button. A new


cleura
Dashboard
Compute
Networking
Storage
Images
Security Groups
Orchestration
Kubernetes
Logs
Users
Invoices
Support
API
Monitoring
/ Dashboard
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



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 chec

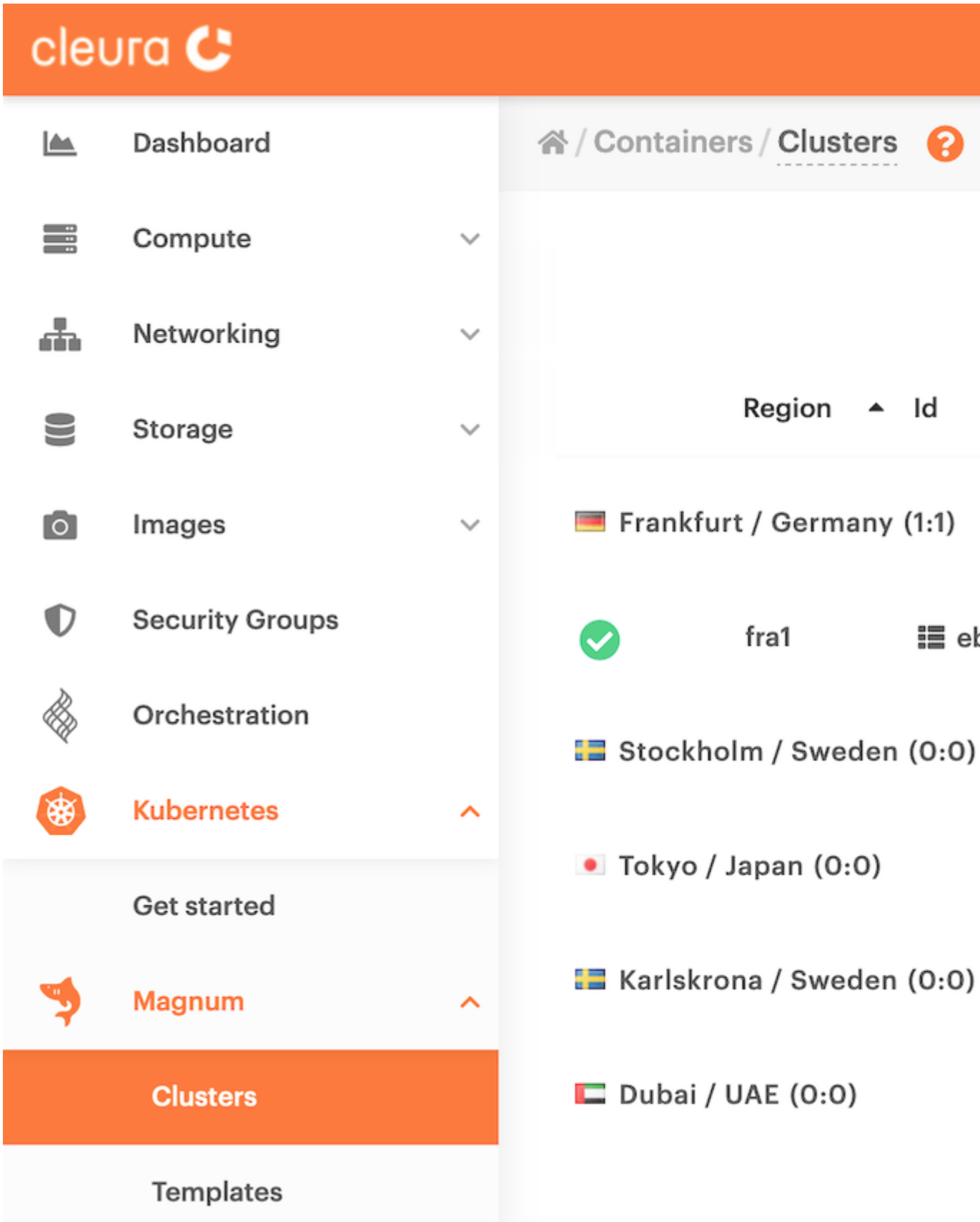
```
openstack coe cluster list -c status
```

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

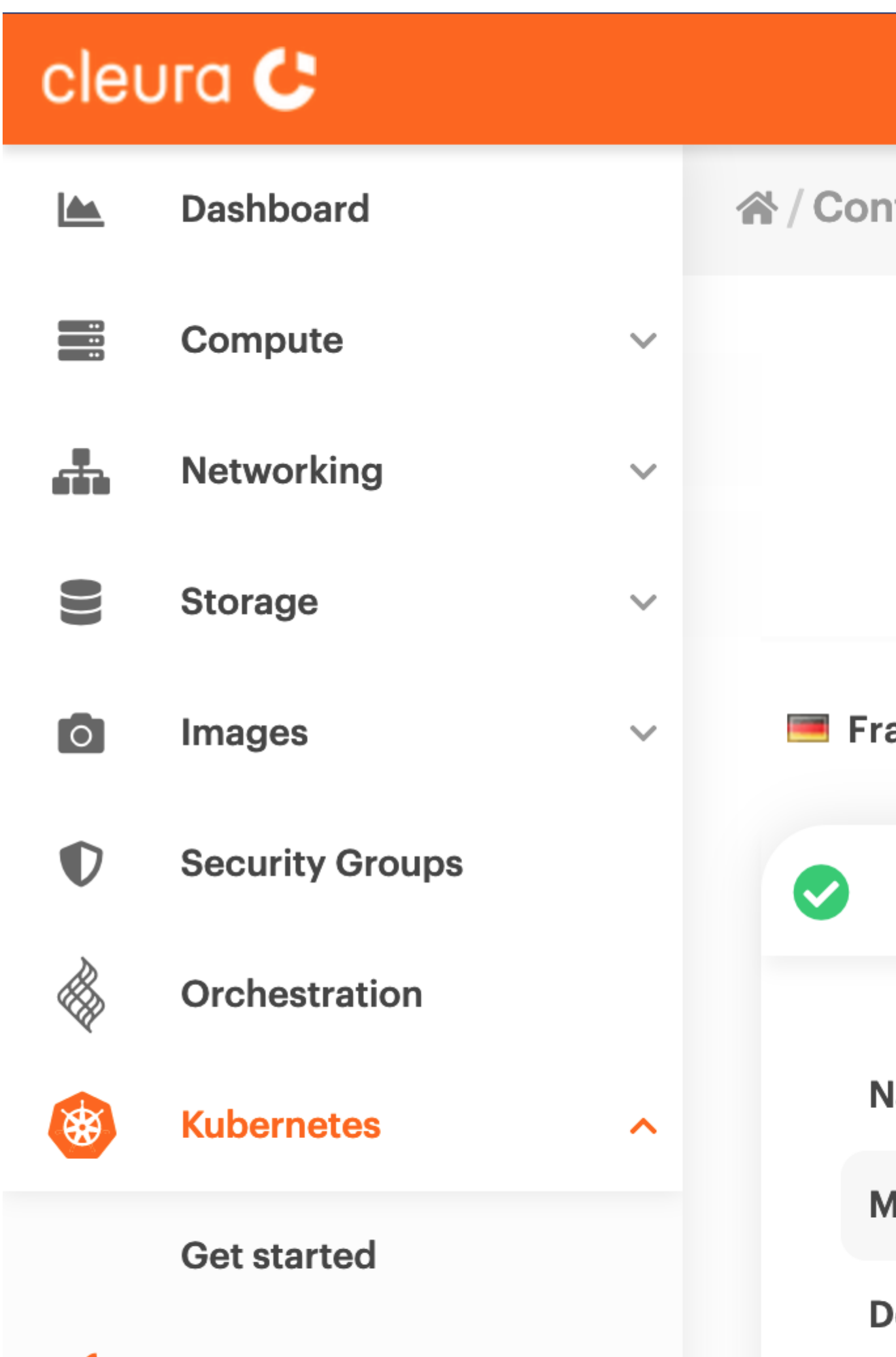
Viewing the Kubernetes cluster

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*.


cleura
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
```

ıning 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=$
```

he `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
```

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