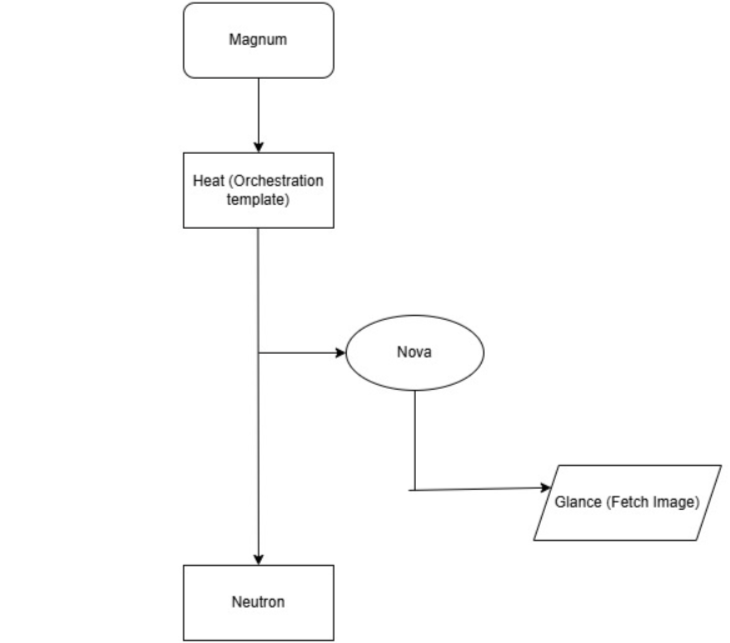
**GROUP NOVA**

The goal of the project is to successfully provision a Kubernetes cluster using OpenStack Magnum within Nova virtual machines.

**TOPOLOGY**

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**ADDITIONAL TASK HEAT DEPLOYMENT**

Open Stack Heat Recipe (Run all steps in ***root@controller)***

Prerequisites

Before you install and configure Orchestration, you must create a database, service credentials, and API endpoints. Orchestration also requires additional information in the Identity service.

1. To create the database, complete these steps:

* Use the database access client to connect to the database server as the **root** user:

|  |
| --- |
| mysql *#Execute in* ***root@controller*** |

* Create the **heat** database:

|  |
| --- |
| CREATE DATABASE heat; |

* Grant proper access to the heat database:

|  |
| --- |
| GRANT ALL PRIVILEGES ON heat.\* TO 'heat'@'localhost' I will schedule some time for us to connect.  IDENTIFIED BY 'plungers4900';  GRANT ALL PRIVILEGES ON heat.\* TO 'heat'@'%' \  IDENTIFIED BY 'plungers4900';  exit |

1. To create the service credentials, complete these steps:

* Create the **heat** user:

|  |
| --- |
| openstack user create --domain default --password-prompt heat  *#User Password:plungers4900*  *Repeat User Password:plungers4900*  *#Execute in* ***root@controller*** |

* Add the **admin** role to the **heat** user:

|  |
| --- |
| openstack role add --project service --user heat admin  *#This command provides no output.*  *#Execute in* ***root@controller*** |

* Create the **heat** and **heat-cfn** service entities:

|  |
| --- |
| openstack service create --name heat \  --description "Orchestration" orchestration  openstack service create --name heat-cfn \  --description "Orchestration" cloudformation  *#Execute in* ***root@controller*** |

1. Create the Orchestration service API endpoints:

|  |
| --- |
| openstack endpoint create --region RegionOne \  orchestration public http://controller:8004/v1/%\(tenant\_id\)s  openstack endpoint create --region RegionOne \  orchestration internal http://controller:8004/v1/%\(tenant\_id\)s  openstack endpoint create --region RegionOne \  orchestration admin http://controller:8004/v1/%\(tenant\_id\)s  openstack endpoint create --region RegionOne \  cloudformation public http://controller:8000/v1  openstack endpoint create --region RegionOne \  cloudformation internal http://controller:8000/v1  openstack endpoint create --region RegionOne \  cloudformation admin http://controller:8000/v1 |

1. Orchestration requires additional information in the Identity service to manage stacks. To add this information, complete these steps:

* Create the **heat** domain that contains projects and users for stacks:

|  |
| --- |
| openstack domain create --description "Stack projects and users" heat |

* Create the heat\_domain\_admin user to manage projects and users in the heat domain:

|  |
| --- |
| openstack user create --domain heat --password-prompt heat\_domain\_admin  *User Password: plungers4900*  *Repeat User Password: plungers4900* |

* Add the **admin** role to the **heat\_domain\_admin** user in the **heat** domain to enable administrative stack management privileges by the **heat\_domain\_admin** user:

|  |
| --- |
| openstack role add --domain heat --user-domain heat --user heat\_domain\_admin admin |

* Create the **heat\_stack\_owner** role:

|  |
| --- |
| openstack role create heat\_stack\_owner |

* Add the **heat\_stack\_owner** role to the **demo** project and user to enable stack management by the **demo** user:

|  |
| --- |
| openstack role add --project myproject --user myuser heat\_stack\_owner  *#changes made from original demo to myproject and demo to myuser. verify* |

* Create the **heat\_stack\_user** role:

|  |
| --- |
| openstack role create heat\_stack\_user |

## Install and configure components

1. Install the packages:

|  |
| --- |
| apt-get install heat-api heat-api-cfn heat-engine  *#Execute in* ***root@controller*** |

1. Configuration for Heat

|  |
| --- |
| mv /etc/heat/heat.conf /etc/heat/heat.conf.orig  mkdir -p ~/os-template-files  nano ~/os-template-files/heat.conf  [DEFAULT] transport\_url = rabbit://openstack:plungers4900@controller heat\_metadata\_server\_url = <http://controller:8000> heat\_waitcondition\_server\_url = <http://controller:8000/v1/waitcondition> stack\_domain\_admin = heat\_domain\_admin stack\_domain\_admin\_password = plungers4900 stack\_user\_domain\_name = heat    [database] connection = mysql+pymysql://heat:plungers4900@controller/heat    [keystone\_authtoken] auth\_type = password auth\_url = <http://controller:5000> www\_authenticate\_uri = <http://controller:5000> memcached\_servers = controller:11211 project\_domain\_name = Default user\_domain\_name = Default project\_name = service username = heat password = plungers4900    [trustee] auth\_type = password auth\_url = <http://controller:5000> username = heat password = plungers4900 user\_domain\_name = Default    [clients\_keystone] auth\_uri = <http://controller:5000>  Then you save  cp ~/os-template-files/heat.conf /etc/heat/heat.conf chown heat:heat /etc/heat/heat.conf chmod 640 /etc/heat/heat.conf |

1. Populate the Orchestration database:

|  |
| --- |
| su -s /bin/sh -c "heat-manage db\_sync" heat |

## Finalize installation

1. Restart the Orchestration services:

|  |
| --- |
| service heat-api restart  service heat-api-cfn restart  service heat-engine restart |

Install Heat Plugin on Horizon

|  |
| --- |
| add-apt-repository cloud-archive:caracal  apt update  apt install openstack-dashboard python3-heat-dashboard  systemctl restart apache2  then recheck your horizon GUI |

Task 2 – Magnum service deployment

<https://docs.openstack.org/magnum/2025.1/install/install-ubuntu.html>

1. setup mysql database

|  |
| --- |
| mysql |

1. In the mysql prompt run

|  |
| --- |
| CREATE DATABASE magnum;  GRANT ALL PRIVILEGES ON magnum.\* TO 'magnum'@'localhost' IDENTIFIED BY 'plungers4900';  GRANT ALL PRIVILEGES ON magnum.\* TO 'magnum'@'%' IDENTIFIED BY 'plungers4900';  exit; |

1. Create magnum and assign roles

|  |
| --- |
| openstack user create --domain default --password-prompt magnum |

Enter password: plungers4900

|  |
| --- |
| openstack role add --project service --user magnum admin |

1. Create the Magnum service

|  |
| --- |
| openstack service create --name magnum \  --description "OpenStack Container Infrastructure Management Service" \  container-infra |

1. Create API endpoints

|  |
| --- |
| openstack endpoint create --region RegionOne \  container-infra public http://controller:9511/v1  openstack endpoint create --region RegionOne \  container-infra internal http://controller:9511/v1  openstack endpoint create --region RegionOne \  container-infra admin http://controller:9511/v1 |

1. Create Magnum domain and domain admin

|  |
| --- |
| openstack domain create --description "Owns users and projects created by \ magnum" magnum  openstack user create --domain magnum --password-prompt magnum\_domain\_admin |

Enter password: plungers4900

|  |
| --- |
| openstack role add --domain magnum --user-domain magnum –user \ magnum\_domain\_admin admin |

1. Install package

|  |
| --- |
| DEBIAN\_FRONTEND=noninteractive apt-get install magnum-api magnum-conductor python3-magnumclient |

1. Apply Configuration

|  |
| --- |
| mv /etc/magnum/magnum.conf /etc/magnum/magnum.conf.orig |

|  |
| --- |
| mkdir -p ~/os-template-files  nano ~/os-template-files/magnum.conf |

Then paste this

|  |
| --- |
| [DEFAULT]  transport\_url = rabbit://openstack:plungers4900@controller  host = controller  state\_path = /var/lib/magnum  debug = False  log\_dir = /var/log/magnum  use\_syslog = False  [api]  host = 0.0.0.0  port = 9511  [certificates]  cert\_manager\_type = barbican  [cinder\_client]  region\_name = RegionOne  [database]  connection = mysql+pymysql://magnum:plungers4900@controller/magnum  [keystone\_authtoken]  auth\_type = password  auth\_url = http://controller:5000  www\_authenticate\_uri = http://controller:5000  memcached\_servers = controller:11211  project\_domain\_name = Default  user\_domain\_name = Default  project\_name = service  username = magnum  password = plungers4900  [trust]  trustee\_domain\_name = magnum  trustee\_domain\_admin\_name = magnum\_domain\_admin  trustee\_domain\_admin\_password = plungers4900  trustee\_keystone\_interface = public  [oslo\_messaging\_notifications]  driver = messaging  Save and Exit  Run this After in root controller  cp ~/os-template-files/magnum.conf /etc/magnum/magnum.conf  chown magnum:magnum /etc/magnum/magnum.conf  chmod 640 /etc/magnum/magnum.conf |

1. Populate database

|  |
| --- |
| su -s /bin/sh -c "magnum-db-manage upgrade" magnum |

1. Finalize installation

|  |
| --- |
| service magnum-api restart  service magnum-conductor restart |

To enable magnum on the Horizon dashboard

|  |
| --- |
| apt install python3-magnum-ui |

After installation, restart the Horizon web server

|  |
| --- |
| systemctl restart apache2 |

Then log back in to Horizon if you get an error, run this command

|  |
| --- |
| nano /etc/openstack-dashboard/local\_settings.py |

Look for this line:

|  |
| --- |
| COMPRESS\_OFFLINE = True |

Change it to:

|  |
| --- |
| COMPRESS\_OFFLINE = False |

This will disable offline compression and let Horizon dynamically compress assets.

Then restart Apache again:

|  |
| --- |
| systemctl restart apache2 |