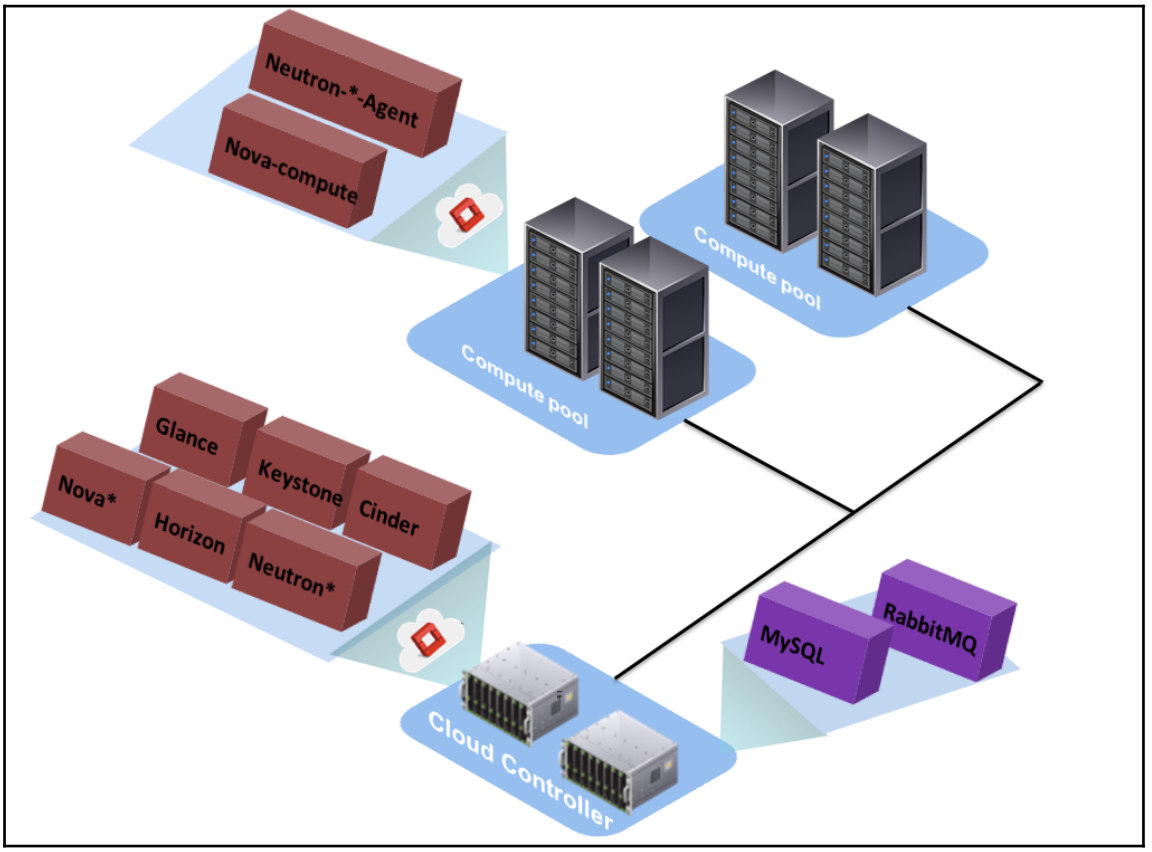
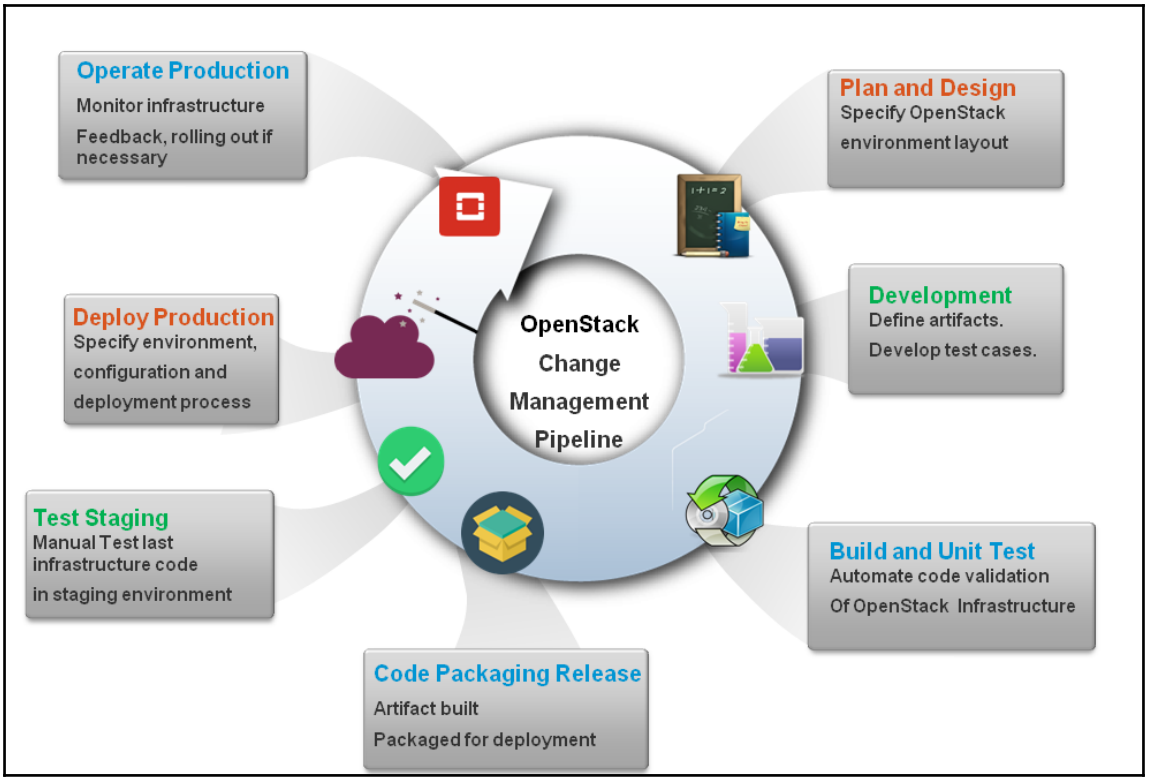
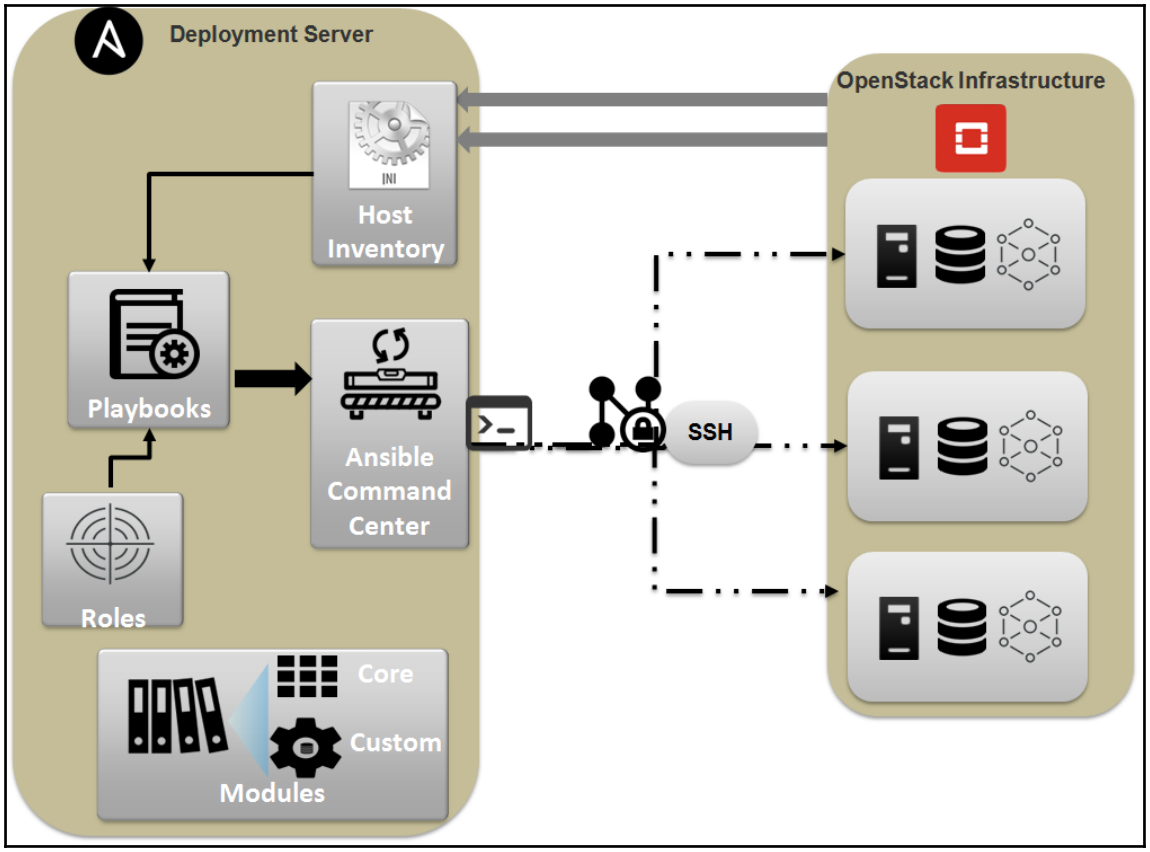
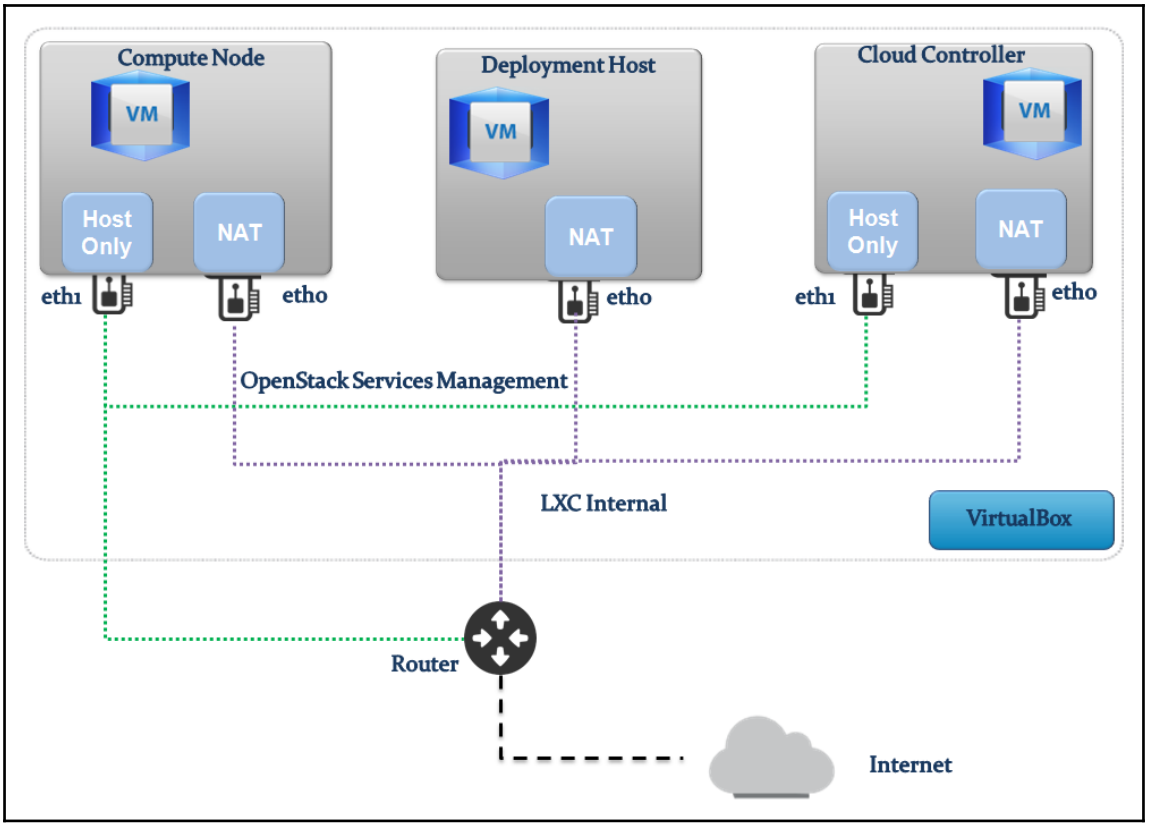
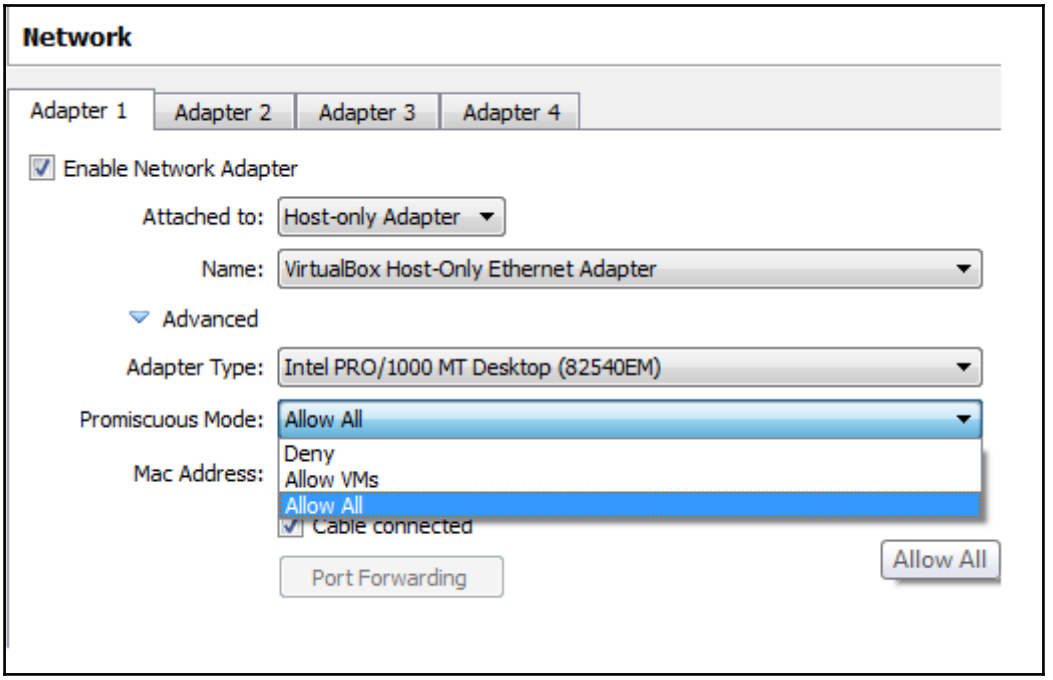
Chapter 1: Inflating the OpenStack Setup

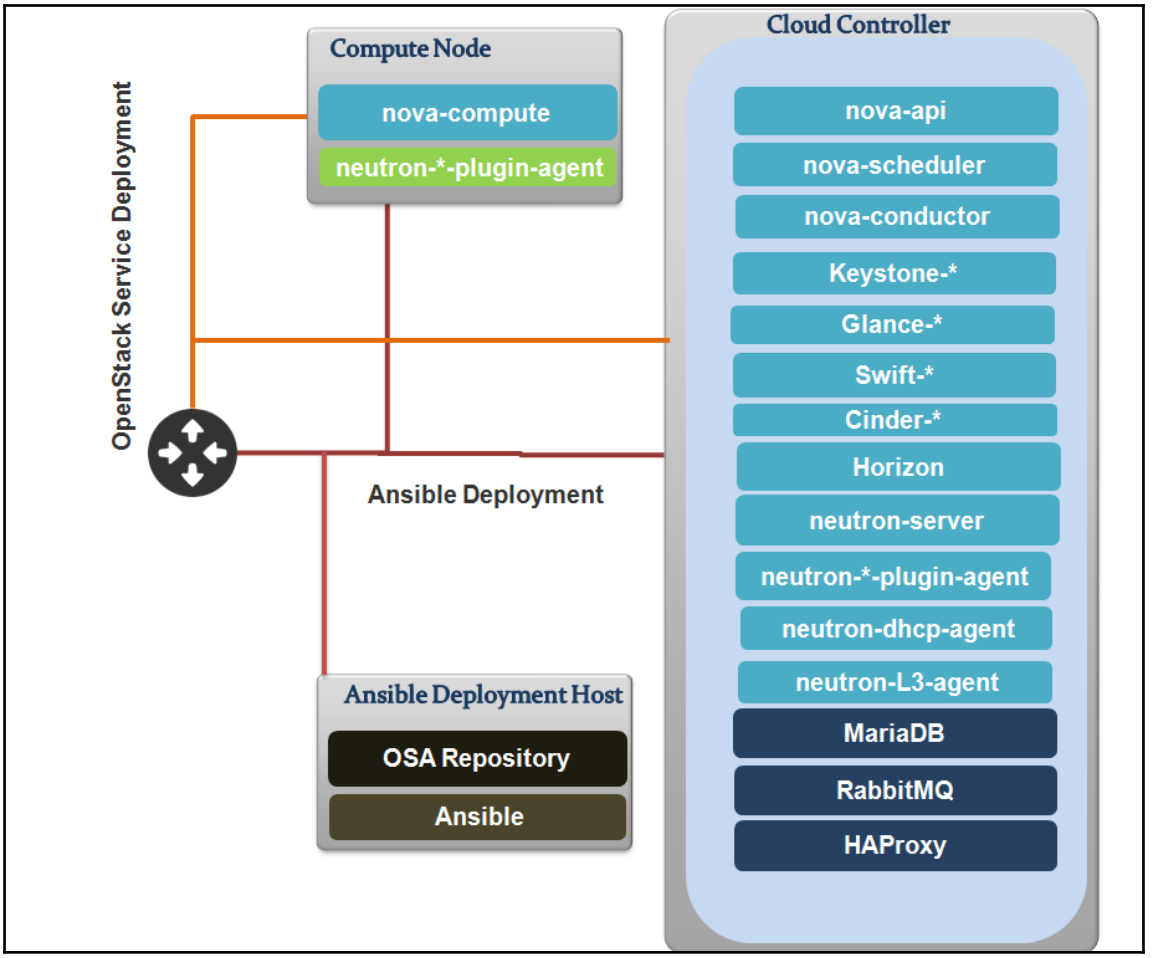



Operate Production
Monitor infrastructure
Feedback, rolling out if necessary
Plan and Design
Specify OpenStack
environment layout
Development
Define artifacts.
Develop test cases.
Build and Unit Test
Automate code validation
Of OpenStack Infrastructure
Code Packaging Release
Artifact built
Packaged for deployment
Test Staging
Manual Test last infrastructure code
in staging environment
Deploy Production
Specify environment, configuration and
deployment process
OpenStack
Change
Management
Pipeline


Deployment Server
INI
Host Inventory
Playbooks
Ansible Command Center
Roles
Core
Custom
Modules
SSH
OpenStack Infrastructure


Compute Node
VM
Host Only
NAT
eth1
eth0
Deployment Host
VM
NAT
eth0
Cloud Controller
VM
Host Only
NAT
eth1
eth0
OpenStack Services Management
LXC Internal
VirtualBox
Router
Internet


Network
Adapter 1
Adapter 2
Adapter 3
Adapter 4
Enable Network Adapter
Attached to:
Host-only Adapter
Name:
VirtualBox Host-Only Ethernet Adapter
Advanced
Adapter Type:
Intel PRO/1000 MT Desktop (82540EM)
Promiscuous Mode:
Allow All
Deny
Allow VMs
Allow All
Mac Address:
Cable connected
Port Forwarding
Allow All




```
Creating backup file [ /opt/openstack-ansible/etc/openstack_deploy/user_secrets.yml.tar ]
Operation Complete, [ /opt/openstack-ansible/etc/openstack_deploy/user_secrets.yml ] is ready
```

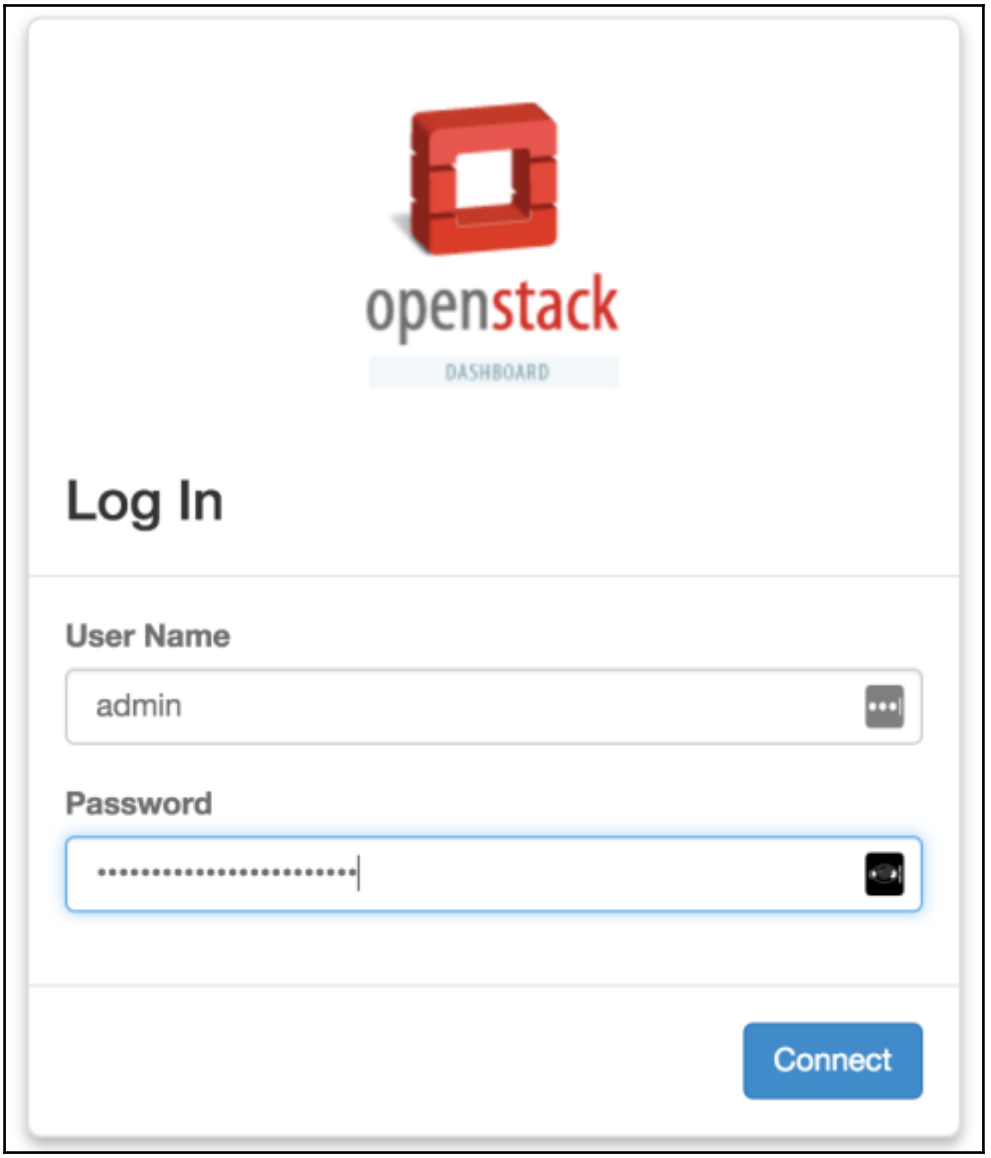
```
- executing: git clone https://git.openstack.org/openstack/openstack-ansibl
- executing: git archive --prefix=repo_build/ --output=/tmp/tmpR3aLx3.tar a
- extracting repo_build to /etc/ansible/roles/repo_build
- repo_build was installed successfully
- dependency pip_install is already installed, skipping.
- dependency apt_package_pinning is already installed, skipping.
- dependency galera_client is already installed, skipping.
- executing: git clone https://git.openstack.org/openstack/openstack-ansibl
- executing: git archive --prefix=repo_server/ --output=/tmp/tmptmjiap.tar
- extracting repo_server to /etc/ansible/roles/repo_server
- repo_server was installed successfully
```

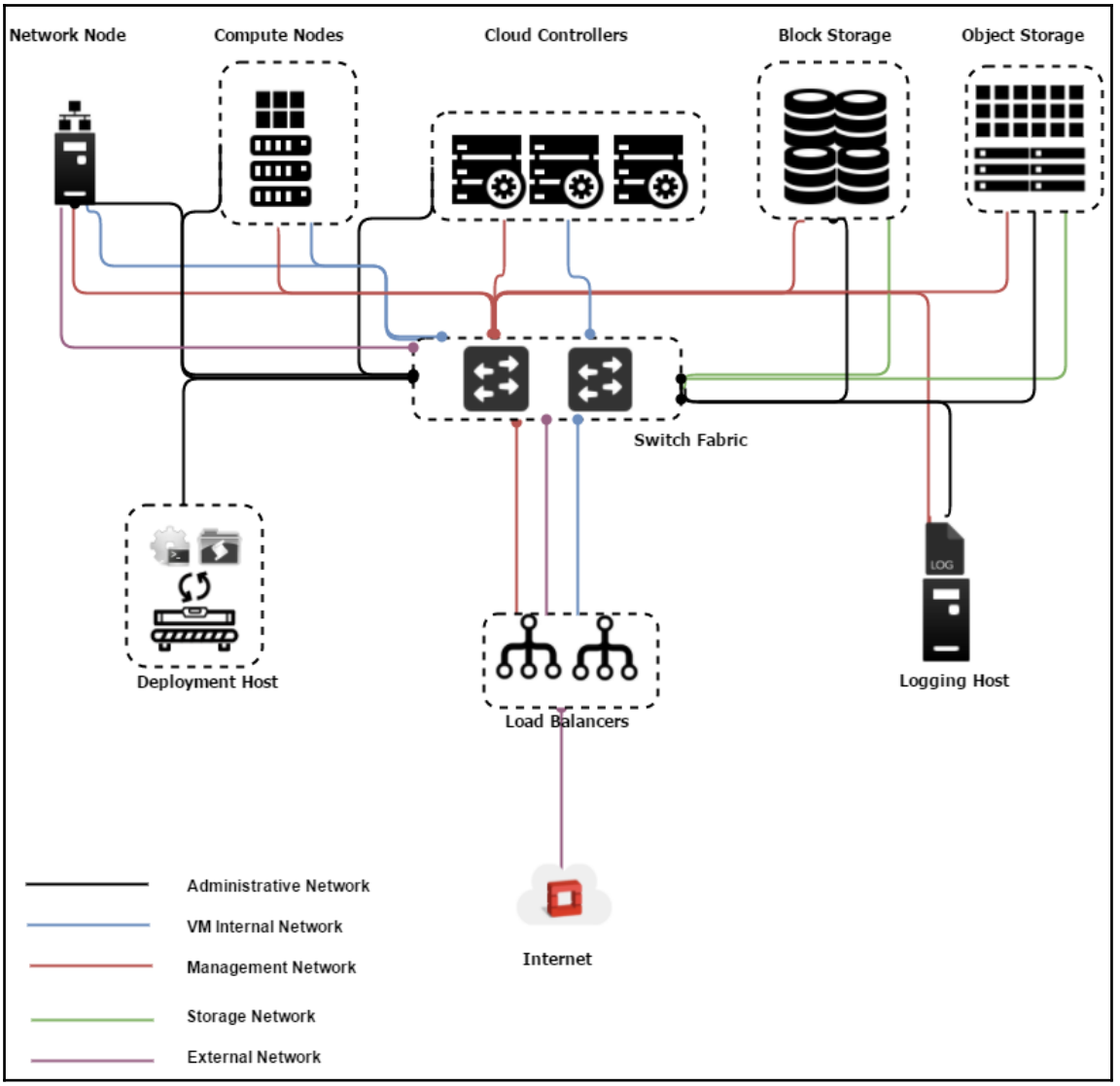
```
TASK: bootstrap-host : Install required packages ---------------------- 954.66s
TASK: pip_install : Get Modern PIP ------------------------------------ 17.68s
TASK: bootstrap-host : Start the network interfaces ------------------- 9.68s
TASK: bootstrap-host : Update apt-cache ------------------------------- 4.47s
TASK: bootstrap-host : Format the Swift files ------------------------- 3.99s
TASK: pip_install : Install pip packages ------------------------------ 3.83s
TASK: setup ----------------------------------------------------------- 2.62s
TASK: pip_install : Install PIP --------------------------------------- 2.00s
TASK: pip_install : Create pip config directory ----------------------- 1.69s
TASK: bootstrap-host : Determine the fastest available OpenStack-Infra wheel mirror --- 1.58s
+ popd
/opt/openstack-ansible
```

```
                                                 STATE   AUTOSTART GROUPS           IPV4
aodh_container-70cdf33d                          RUNNING 1         onboot, openstack 10.255.255.171,
ceilometer_api_container-16fe9226                RUNNING 1         onboot, openstack 10.255.255.189,
ceilometer_collector_container-72ab041c          RUNNING 1         onboot, openstack 10.255.255.209,
cinder_api_container-cd15f0d2                    RUNNING 1         onboot, openstack 10.255.255.41,
cinder_scheduler_container-489fc683              RUNNING 1         onboot, openstack 10.255.255.132,
galera_container-1930b1a0                        RUNNING 1         onboot, openstack 10.255.255.66,
glance_container-33f98508                        RUNNING 1         onboot, openstack 10.255.255.190,
gnocchi_container-386eb4bc                       RUNNING 1         onboot, openstack 10.255.255.40,
heat_apis_container-a9372f6a                     RUNNING 1         onboot, openstack 10.255.255.143,
heat_engine_container-99b8aab1                   RUNNING 1         onboot, openstack 10.255.255.108,
horizon_container-dcb08a11                       RUNNING 1         onboot, openstack 10.255.255.188,
keystone_container-db00df62                      RUNNING 1         onboot, openstack 10.255.255.133,
memcached_container-592df24c                     RUNNING 1         onboot, openstack 10.255.255.147,
neutron_agents_container-729a602f                RUNNING 1         onboot, openstack 10.255.255.202,
neutron_server_container-1ba99d59                RUNNING 1         onboot, openstack 10.255.255.231,
nova_api_metadata_container-d772dc9d             RUNNING 1         onboot, openstack 10.255.255.219,
nova_api_os_compute_container-38a80900           RUNNING 1         onboot, openstack 10.255.255.154,
nova_cert_container-64420c97                     RUNNING 1         onboot, openstack 10.255.255.236,
nova_conductor_container-68ce1148                RUNNING 1         onboot, openstack 10.255.255.210,
nova_console_container-552f6a20                  RUNNING 1         onboot, openstack 10.255.255.5, 1
nova_scheduler_container-a4606380                RUNNING 1         onboot, openstack 10.255.255.146,
rabbit_mq_container-d8b9ac65                     RUNNING 1         onboot, openstack 10.255.255.233,
repo_container-aa32c35e                          RUNNING 1         onboot, openstack 10.255.255.230,
rsyslog_container-59f5f9d8                       RUNNING 1         onboot, openstack 10.255.255.136,
swift_proxy_container-88f11481                   RUNNING 1         onboot, openstack 10.255.255.225,
utility_container-55723a11                       RUNNING 1         onboot, openstack 10.255.255.138,
```

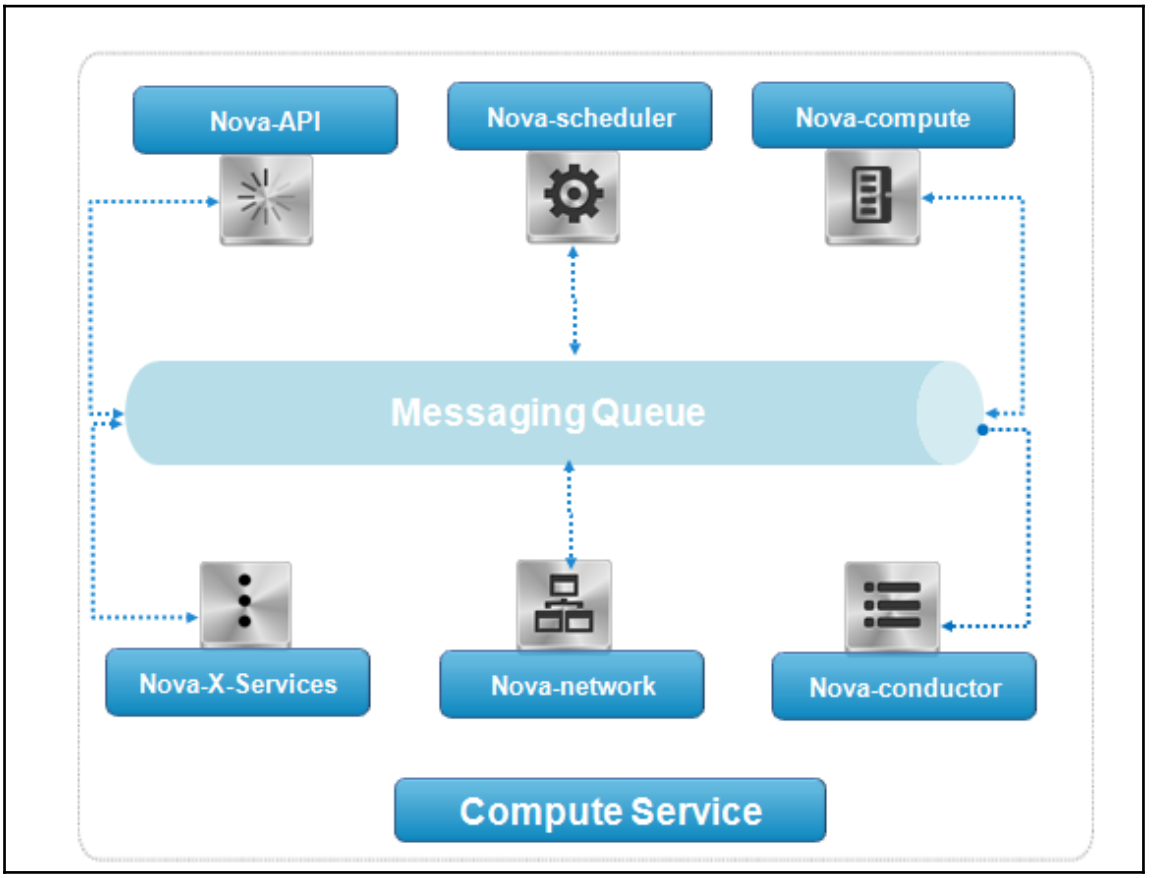
```
# COMMON OPENSTACK ENVS
export OS_ENDPOINT_TYPE=internalURL
export OS_INTERFACE=internalURL
export OS_USERNAME=admin
export OS_PASSWORD=c157e74cfe1fdae08663ef7b1350552ed5bb970ed6bc
export OS_PROJECT_NAME=admin
export OS_TENANT_NAME=admin
export OS_AUTH_URL=http://172.29.236.100:5000/v3
```

```
+-------------+----------------------------------+
| Field       | Value                            |
+-------------+----------------------------------+
| description | OpenStack Networking             |
| enabled     | True                             |
| id          | 19713bcfa0f440218ca15449810af7d3 |
| name        | neutron                          |
| type        | network                          |
+-------------+----------------------------------+
```


openstack
DASHBOARD
Log In
User Name
admin
Password
Connect


Network Node
Compute Nodes
Cloud Controllers
Block Storage
Object Storage
Switch Fabric
Deployment Host
Load Balancers
Logging Host
LOG
Internet
Administrative Network
VM Internal Network
Management Network
Storage Network
External Network

Chapter 2: Massively Scaling Computing Power



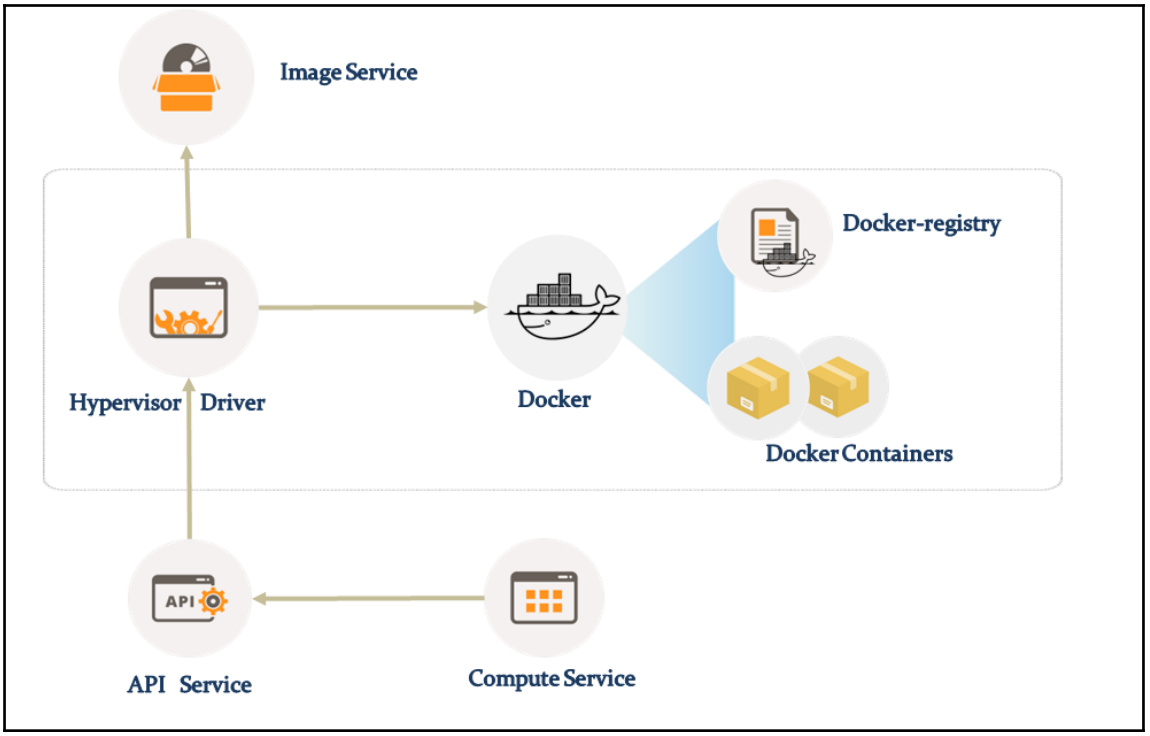
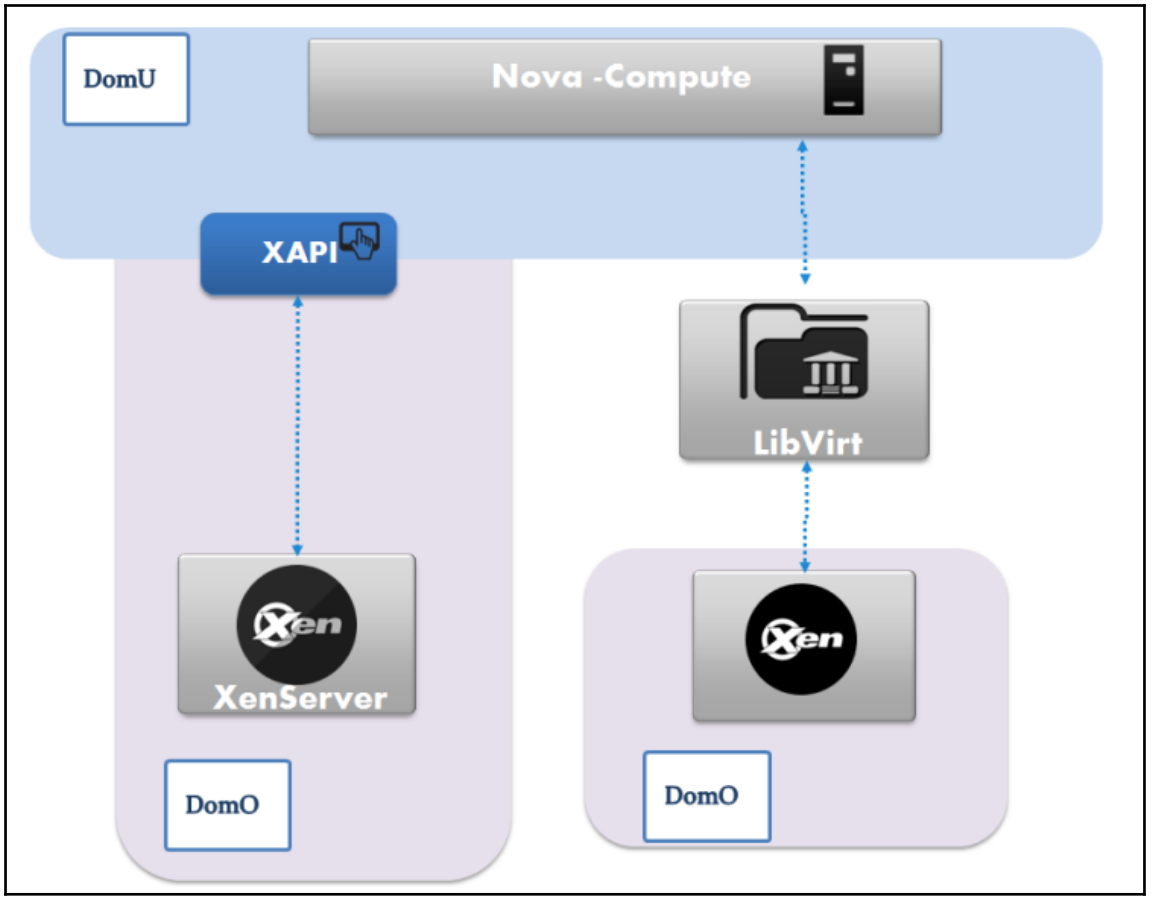
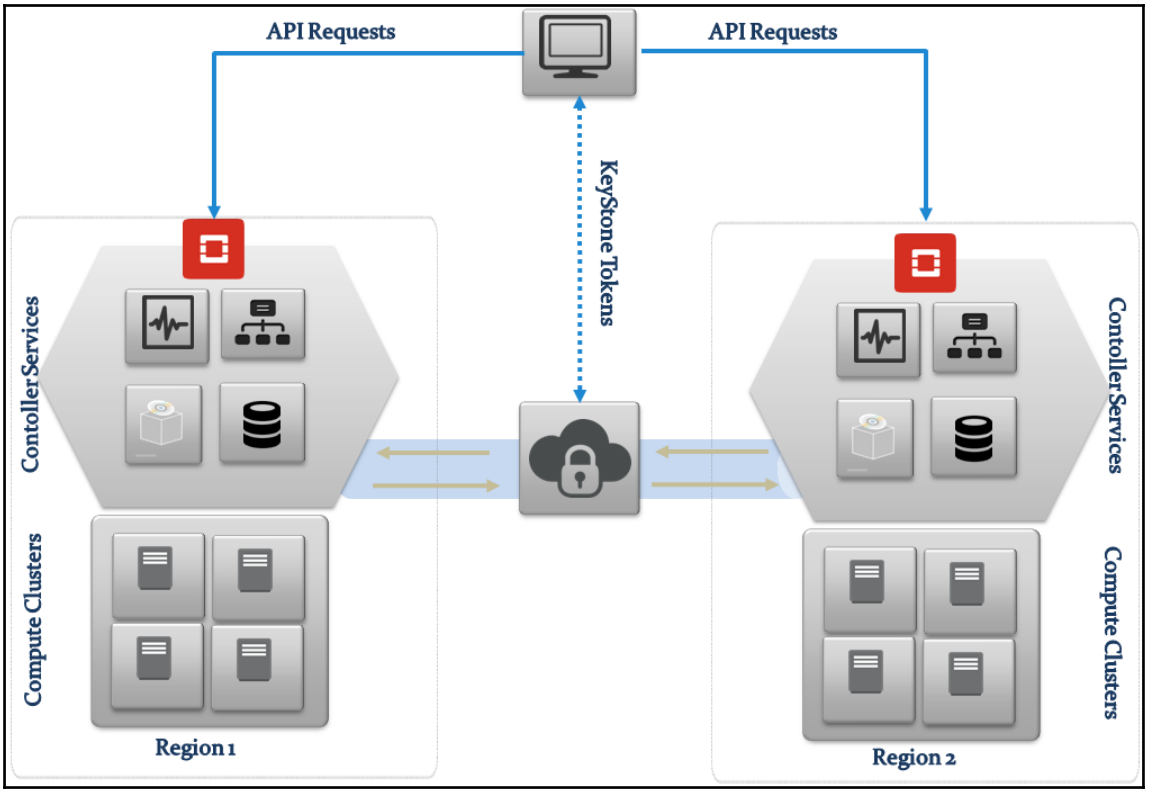
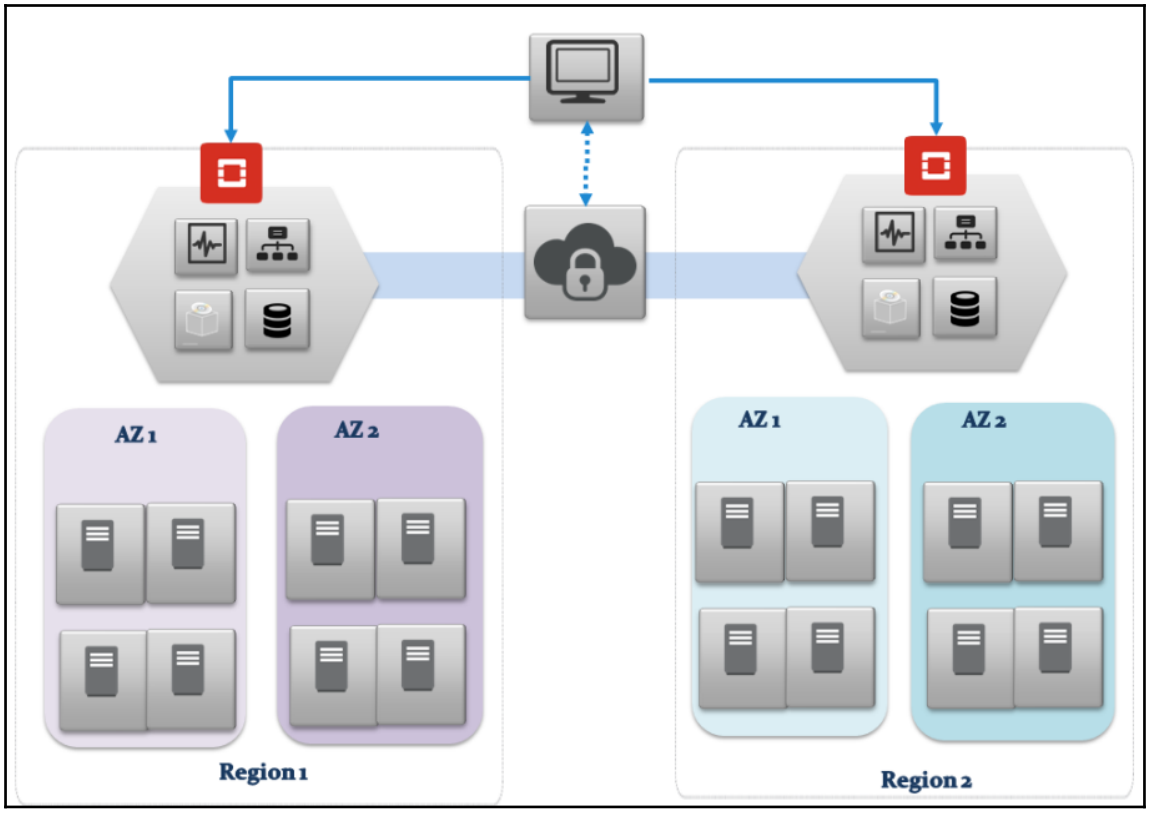
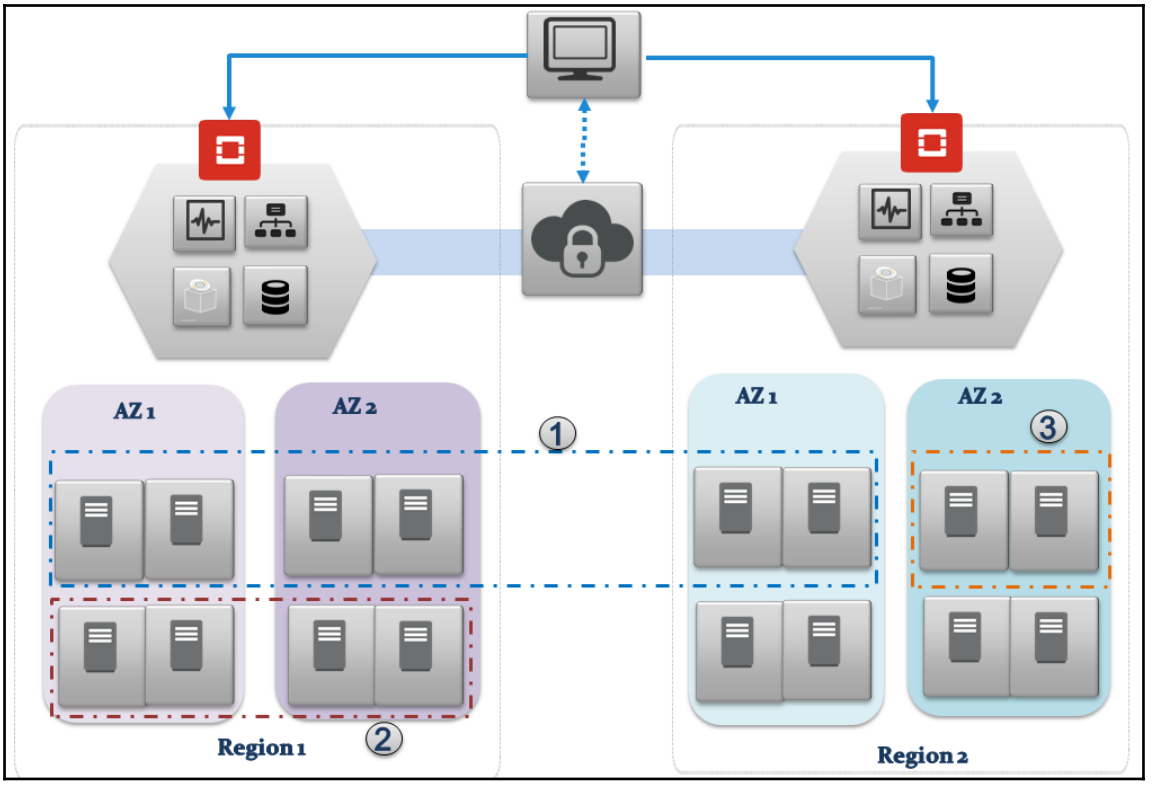


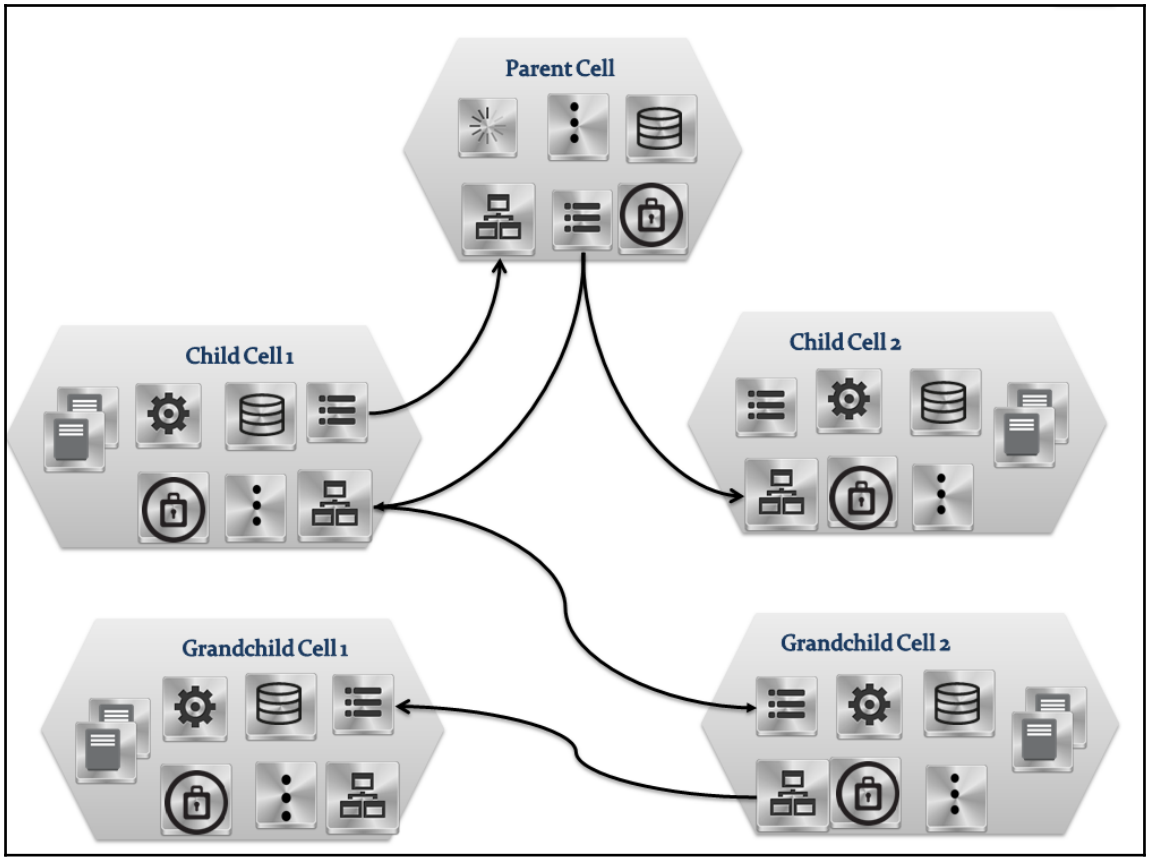
Image Service
Docker-registry
Hypervisor
Driver
Docker
Docker Containers
API
API Service
Compute Service

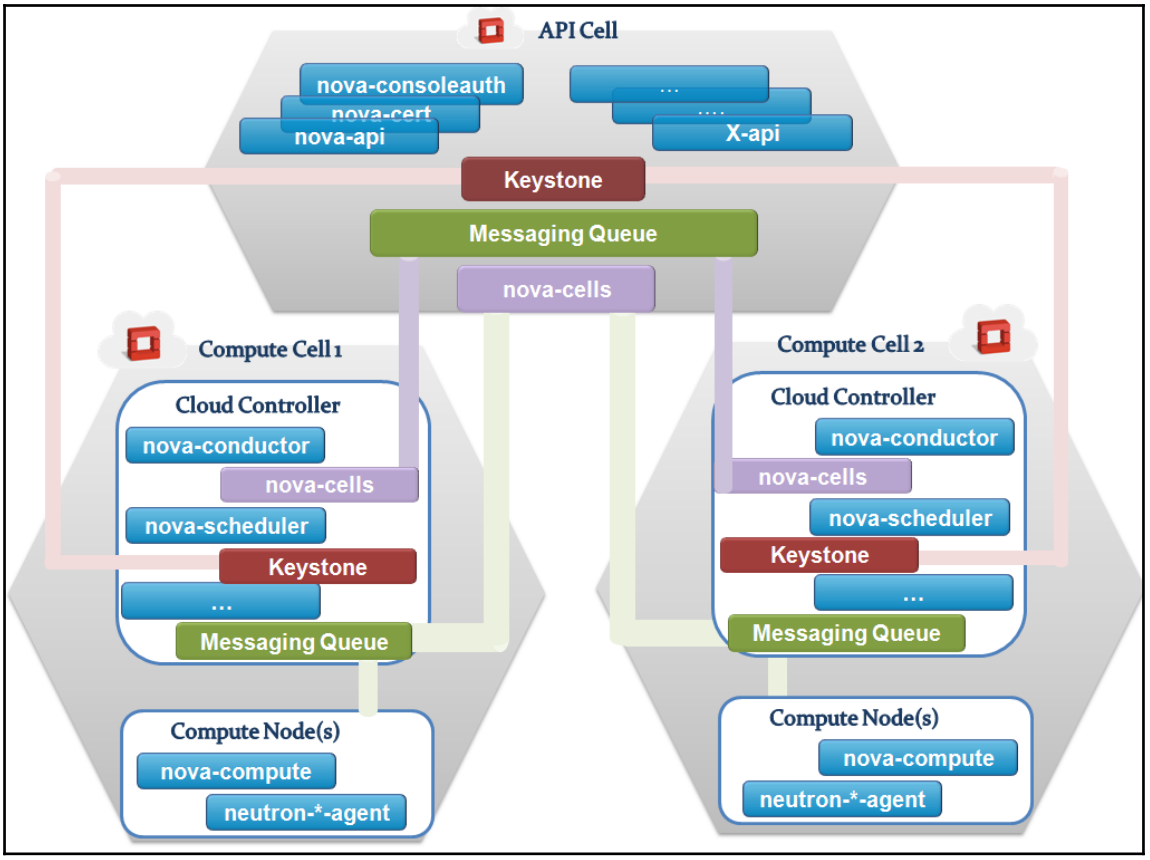

DomU
Nova -Compute
XAPI
LibVirt
XenServer
DomO
DomO

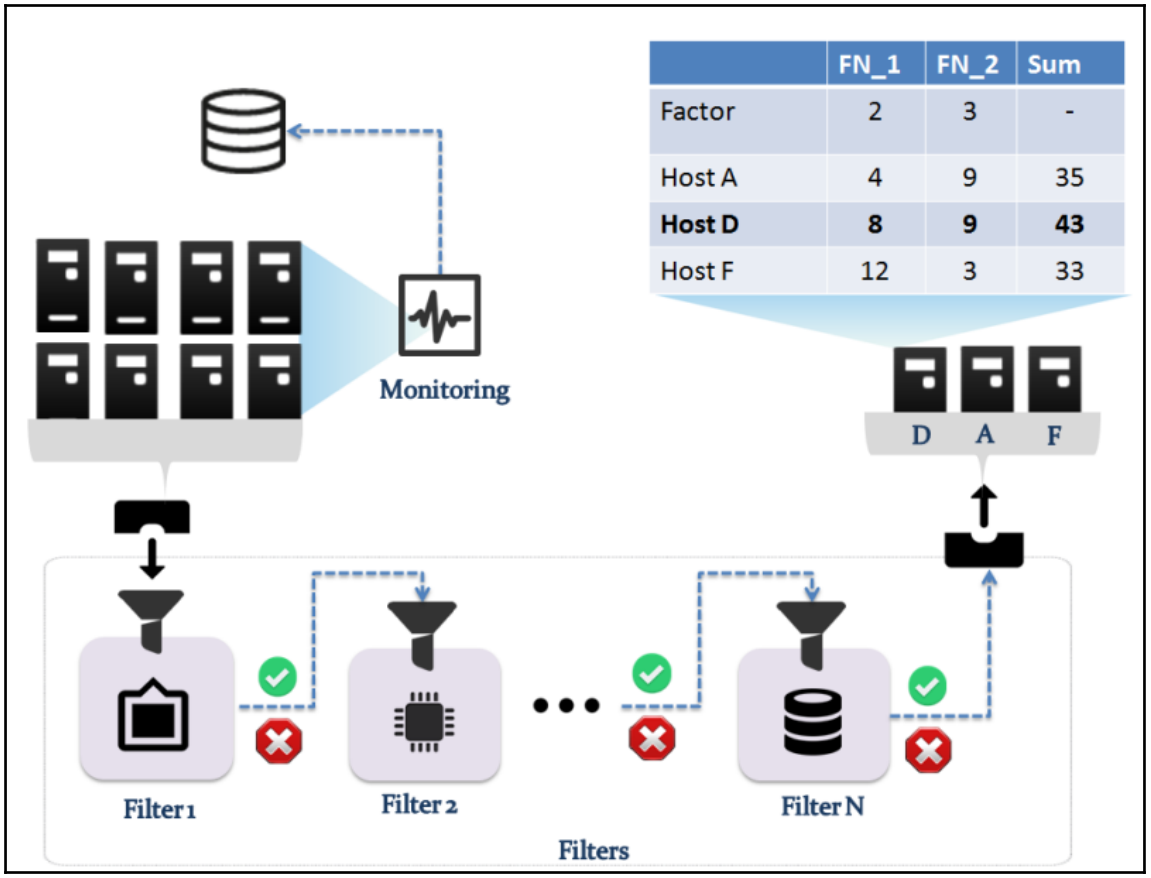

API Requests
API Requests
KeyStone Tokens
Contoller Services
Compute Clusters
Region 1
Contoller Services
Compute Clusters
Region 2


AZ 1
AZ 2
Region 1
AZ 1
AZ 2
Region 2


AZ 1
AZ 2
1
AZ 1
AZ 2
3
2
Region 1
Region 2


Parent Cell
Child Cell 1
Child Cell 2
Grandchild Cell 1
Grandchild Cell 2


API Cell
nova-consoleauth
nova-cert
nova-api
...
....
X-api
Keystone
Messaging Queue
nova-cells
Compute Cell 1
Cloud Controller
nova-conductor
nova-cells
nova-scheduler
Keystone
...
Messaging Queue
Compute Node(s)
nova-compute
neutron-*-agent
Compute Cell 2
Cloud Controller
nova-conductor
nova-cells
nova-scheduler
Keystone
...
Messaging Queue
Compute Node(s)
nova-compute
neutron-*-agent



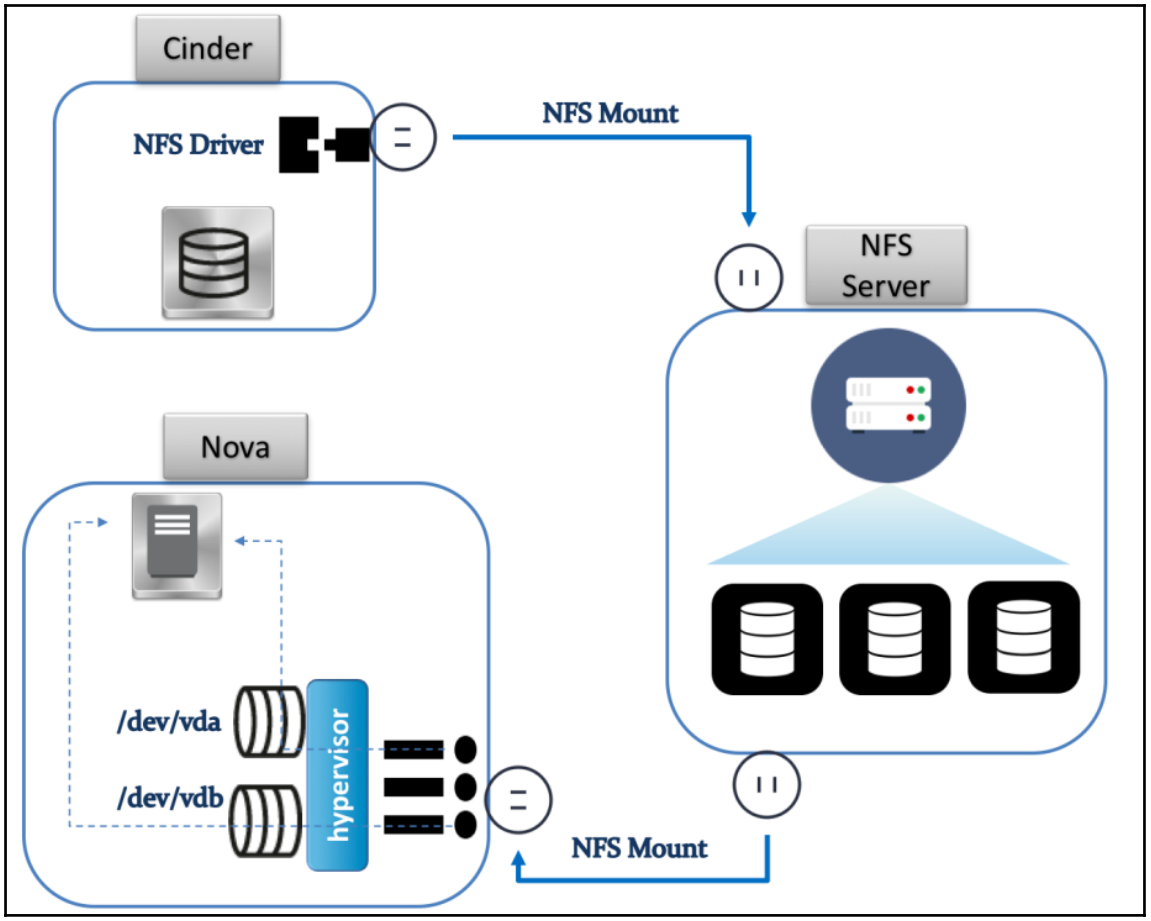
	FN_1	FN_2	Sum
Factor	2	3	-
Host A	4	9	35
Host D	**8**	**9**	**43**
Host F	12	3	33

Chapter 3: Enlarging the OpenStack Storage Capabilities

Property	Value
attachments	[]
availability_zone	nova
bootable	false
consistencygroup_id	None
created_at	2017-07-16T19:41:40.000000
description	Extending Cinder PacktPub
encrypted	False
id	40683bde-36f5-4bea-83c2-dca093441ac1
metadata	{}
migration_status	None
multiattach	False
name	extended volume 01
os-vol-host-attr:host	None
os-vol-mig-status-attr:migstat	None
os-vol-mig-status-attr:name_id	None
os-vol-tenant-attr:tenant_id	6fa47a2b492e48548c2c9596d1c2a5a2
os-volume-replication:driver_data	None
os-volume-replication:extended_status	None
replication_status	disabled
size	4
snapshot_id	None
source_volid	None
status	creating
user_id	375ae5b3359a4a1ba835825fcc3fc8c3
volume_type	None

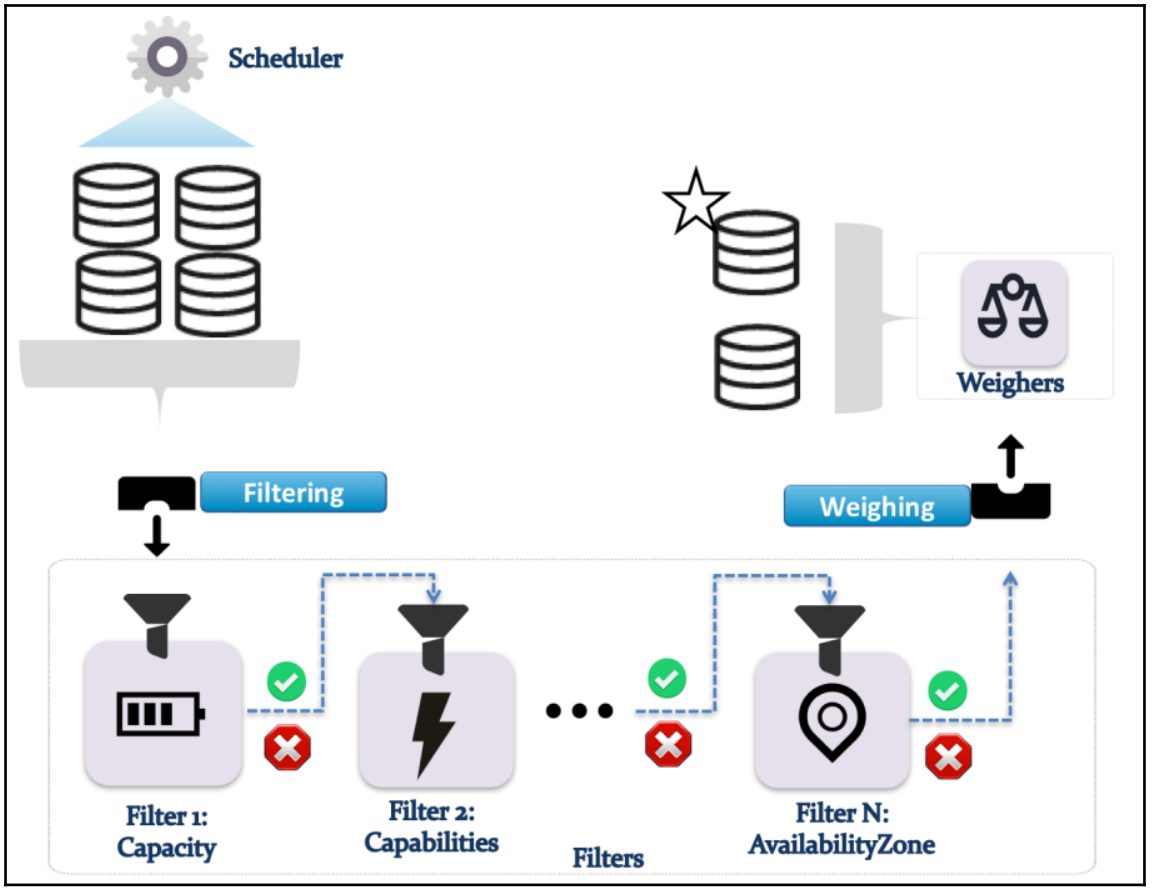
```
  --- Logical volume ---
  LV Path                /dev/cinder-ext-volumes/volume-40683bde-36f5-4bea-83c2-dca093441ac1
  LV Name                volume-40683bde-36f5-4bea-83c2-dca093441ac1
  VG Name                cinder-ext-volumes
  LV UUID                9Qz44p-pwIR-f8Ot-w41h-Cpsa-M2qp-l6g5Yw
  LV Write Access        read/write
  LV Creation host, time cloud, 2017-07-16 21:41:41 +0200
  LV Status              available
  # open                 0
  LV Size                4.00 GiB
  Current LE             1024
  Segments               1
  Allocation             inherit
  Read ahead sectors     auto
  - currently set to     8192
  Block device           253:2
```

```
+--------------------------------------+-----------+-----------------+--------------------+------+-------------+----------+-------------+-------------+
|                  ID                  |   Status  | Migration Status |        Name        | Size | Volume Type | Bootable | Multiattach | Attached to |
+--------------------------------------+-----------+-----------------+--------------------+------+-------------+----------+-------------+-------------+
| 40683bde-36f5-4bea-83c2-dca093441ac1 | available |        -        | extended volume 01 |  4   |      -      |  false   |    False    |             |
+--------------------------------------+-----------+-----------------+--------------------+------+-------------+----------+-------------+-------------+
```


Cinder
NFS Driver
NFS Mount
NFS
Server
Nova
/dev/vda
/dev/vdb
hypervisor
NFS Mount

```
  cluster 93efca28-4b1b-4eae-bfaa-ef159d654e73
   health HEALTH_WARN
          64 pgs degraded
          64 pgs undersized
   monmap e1: 1 mons at {mon0=172.28.128.133:6789/0}
          election epoch 3, quorum 0 mon0
   osdmap e5: 1 osds: 1 up, 1 in
          flags sortbitwise,require_jewel_osds
    pgmap v8: 64 pgs, 1 pools, 0 bytes data, 0 objects
          34004 kB used, 986 MB / 1019 MB avail
                64 undersized+degraded+peered
```

```
+--------------------------------------+-----------+------------------+--------------------+------+-------------+----------+-------------+
|                  ID                  |   Status  | Migration Status |        Name        | Size | Volume Type | Bootable | Multiattach |
+--------------------------------------+-----------+------------------+--------------------+------+-------------+----------+-------------+
| 1848e828-b3d7-4829-8411-1756233fa60f | available |        -         |        rbd         |  5   |      -      |  false   |    False    |
```



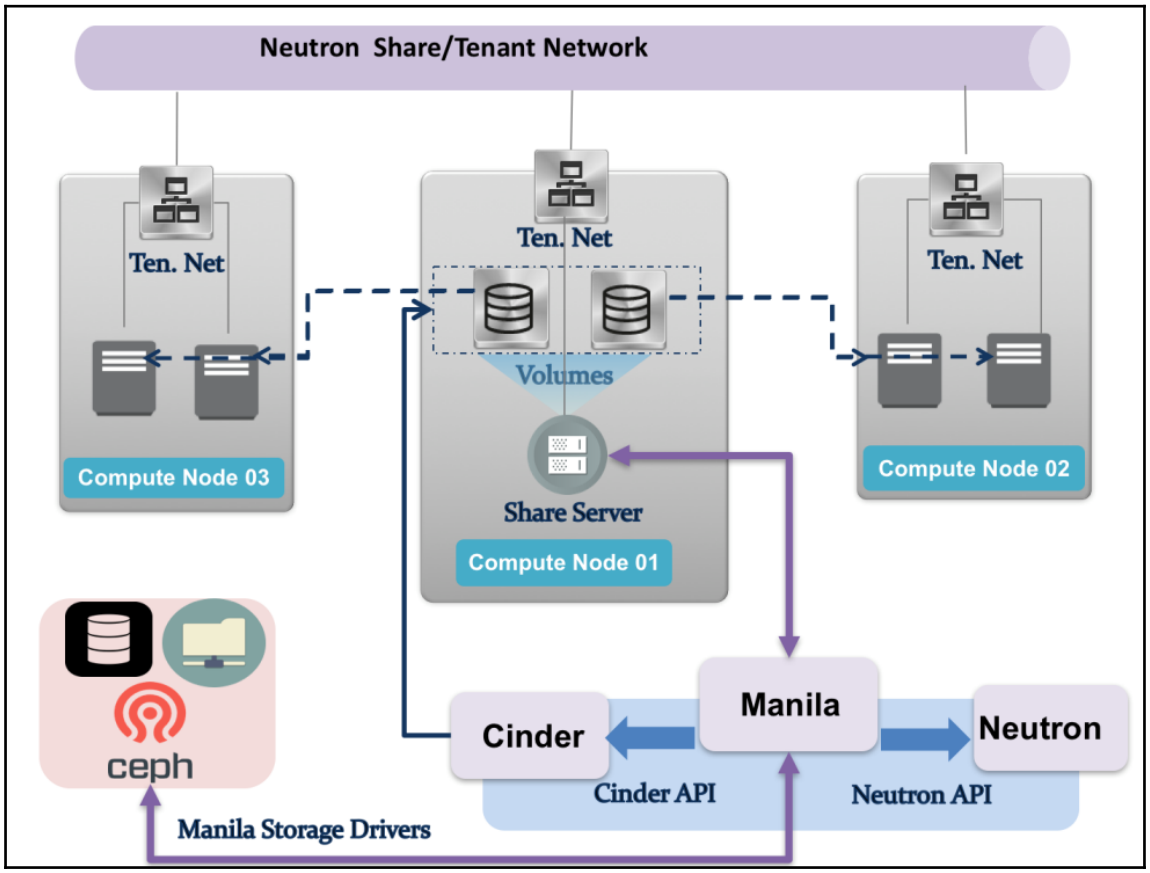

```
+--------------------------------------+--------------+-------------+-----------+
|                  ID                  |     Name     | Description | Is_Public |
+--------------------------------------+--------------+-------------+-----------+
| fda17400-d57d-47f4-a48d-ff3ebec26136 | medium_store |      -      |    True   |
+--------------------------------------+--------------+-------------+-----------+
```

```
+--------------------------------------+-------------+-------------+-----------+
|                  ID                  |     Name    | Description | Is_Public |
+--------------------------------------+-------------+-------------+-----------+
| 408a38b7-9a9c-4a4d-9dc3-10d3a0a289f5 | large_store |      -      |    True   |
+--------------------------------------+-------------+-------------+-----------+
```

Name	Size	Volume Type	Bootable	Multiattach
rbd	5	-	false	False
vol_10g	10	medium_store	false	False

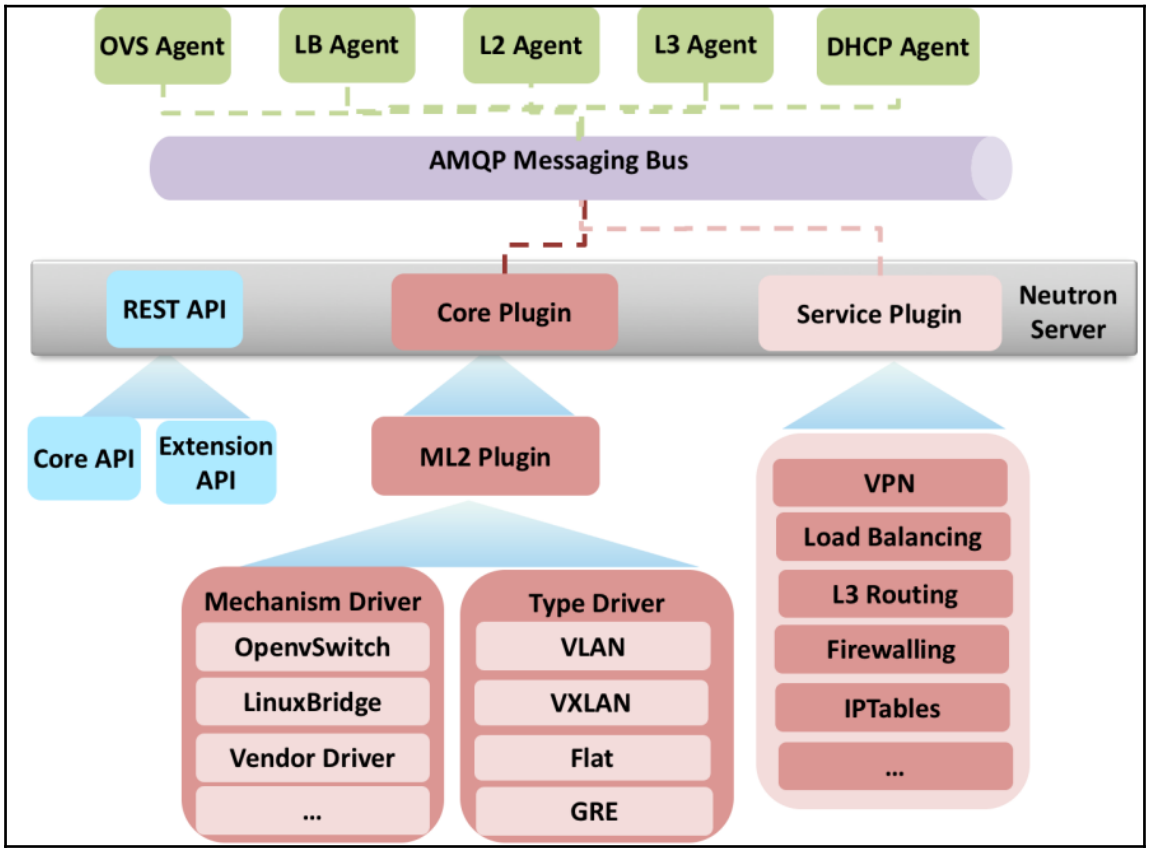
40683bde-36f5-4bea-83c2-dca093441ac1	backing-up	-	extended volume 01	4	-	false	False

ID	Volume ID	Status	Name	Size	Object Count	Container
da01bffd-ed20-443a-8174-96493a9ee860	40683bde-36f5-4bea-83c2-dca093441ac1	available	None	1	22	vol-ext-backups

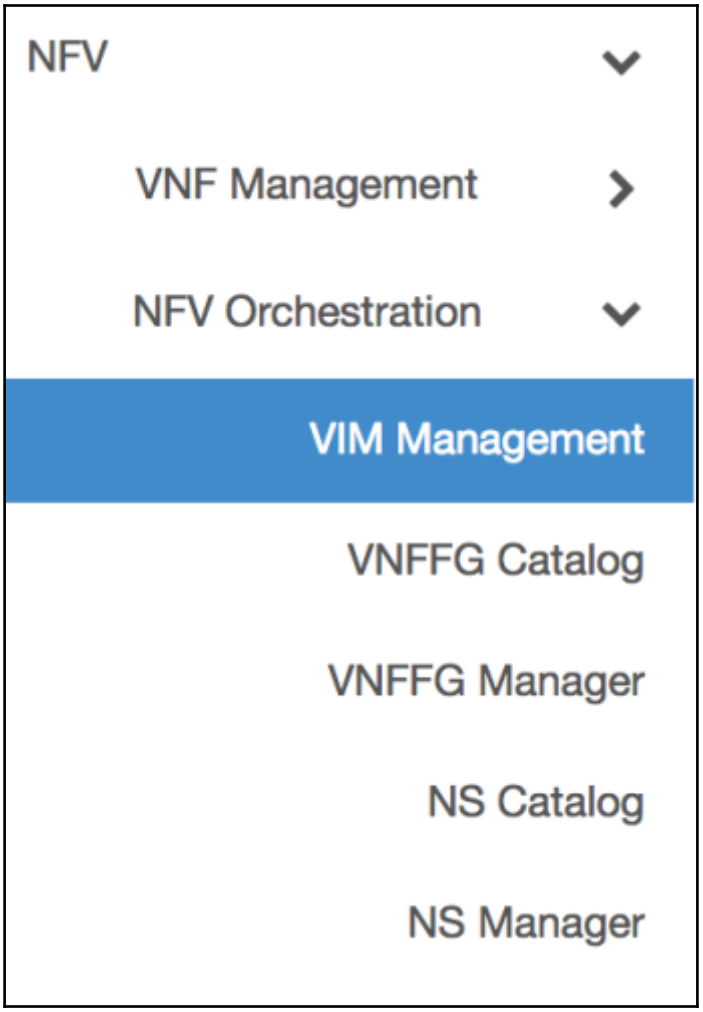


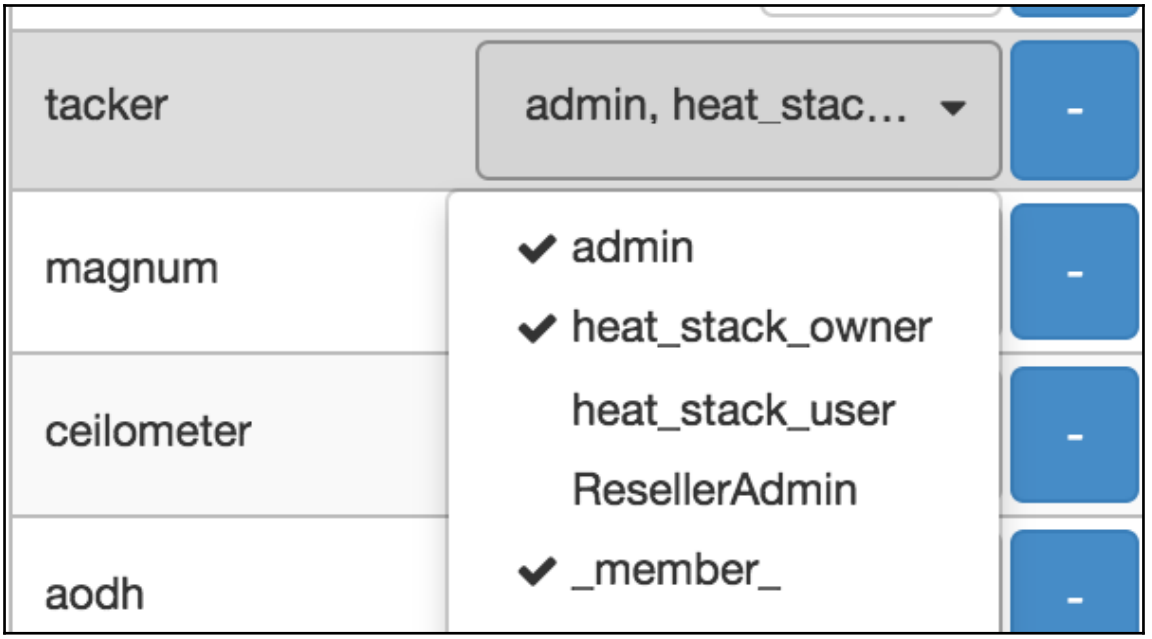
| ID | Path |
| a2e3a1165-de2a-010a-6671-ad1e4c12d2e1 | 10.0.25.50:6789:/volumes/_nogroup/a1334114-fe11-38fe-11a1-1a1a1a3dee22 |

Chapter 4: Harnessing the Power of the OpenStack Network Service

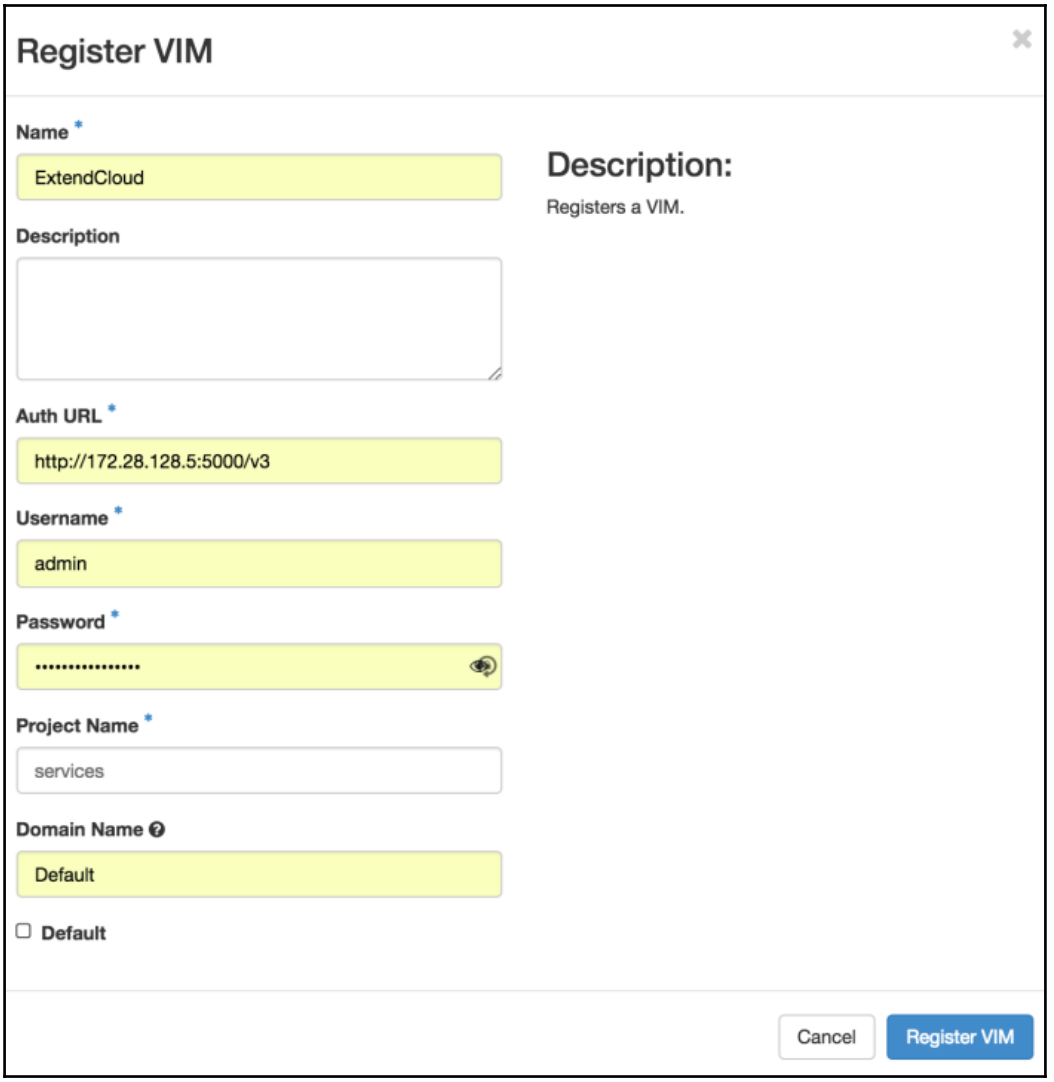


```
Created a new router:
+-----------------------+--------------------------------------+
| Field                 | Value                                |
+-----------------------+--------------------------------------+
| admin_state_up        | True                                 |
| distributed           | False                                |
| external_gateway_info |                                      |
| ha                    | False                                |
| id                    | 63880d49-7bc0-4384-a5e7-35ba9d6c00a7 |
| name                  | ExtendedRouter                       |
| routes                |                                      |
| status                | ACTIVE                               |
| tenant_id             | 6fa47a2b492e48548c2c9596d1c2a5a2     |
+-----------------------+--------------------------------------+
```


NFV
VNF Management
NFV Orchestration
VIM Management
VNFFG Catalog
VNFFG Manager
NS Catalog
NS Manager



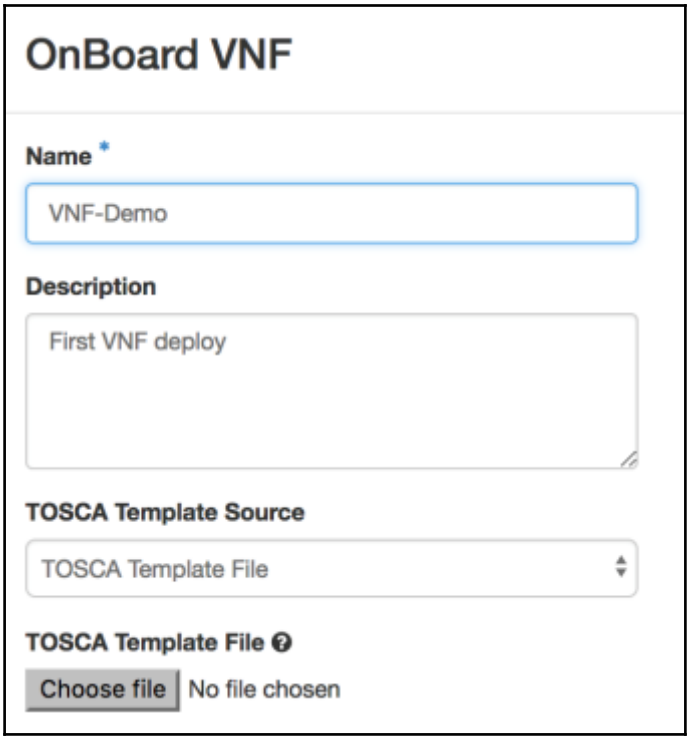

```
INFO tacker.service [req-441c6d47-0f81-40d4-8df6-8f3ff0630eb3 - - - - -] Tacker service started, listening on 172.28.128.5:9890
INFO tacker.wsgi [-] (7503) wsgi starting up on http://172.28.128.5:9890
DEBUG tacker.common.log [-] tacker.nfvo.nfvo_plugin.NfvoPlugin method monitor_vim called with arguments ({'status': u'REACHABLE',
```



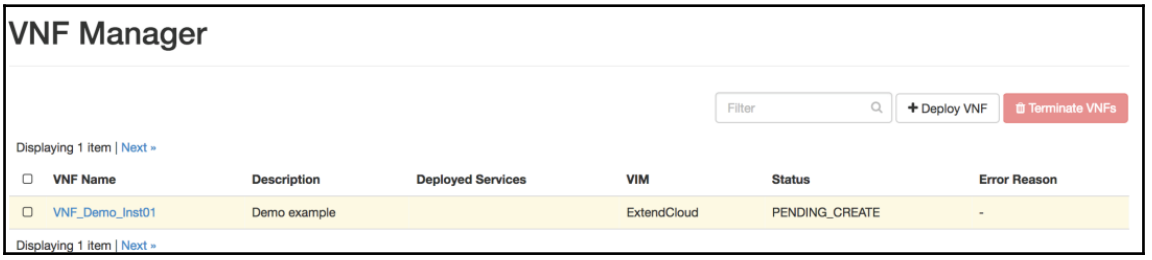
Displaying 1 item

Name	Description	VIM Id	Auth URL	Regions	User	Project	Status
ExtendCloud		373b581b-b3c3-4dcf-842e-b92e48bd8a40	http://172.28.128.5:5000/v3	RegionOne	tacker	services	REACHABLE

Displaying 1 item

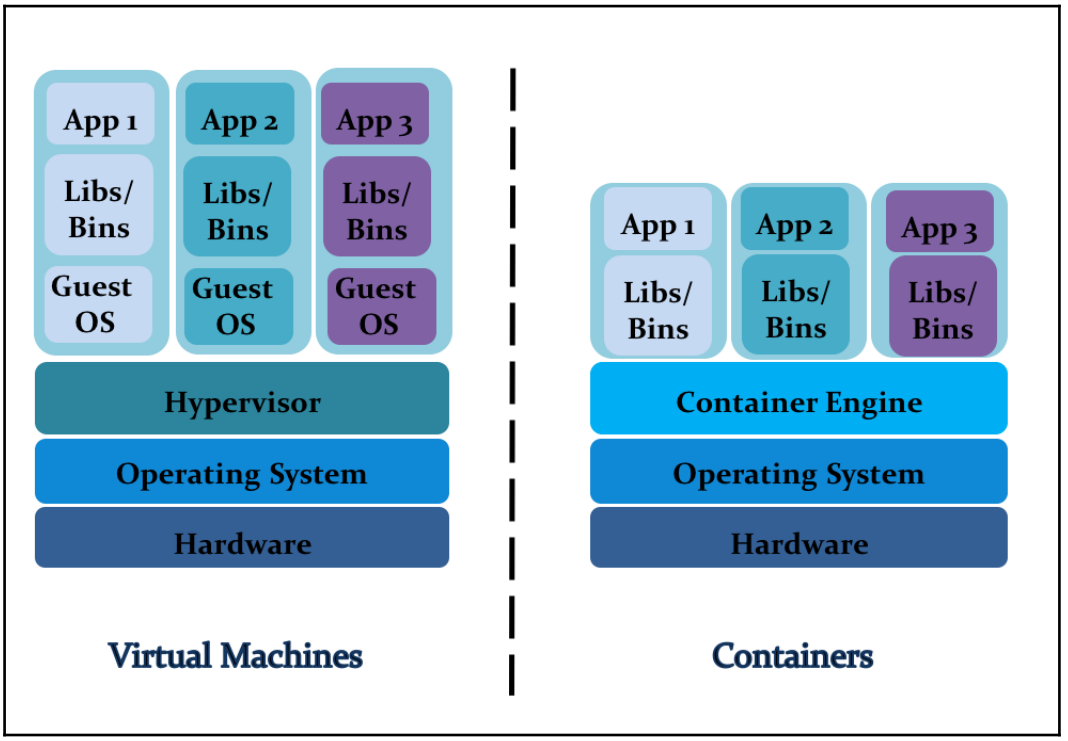

OnBoard VNF
Name *
VNF-Demo
Description
First VNF deploy
TOSCA Template Source
TOSCA Template File
TOSCA Template File
Choose file
No file chosen

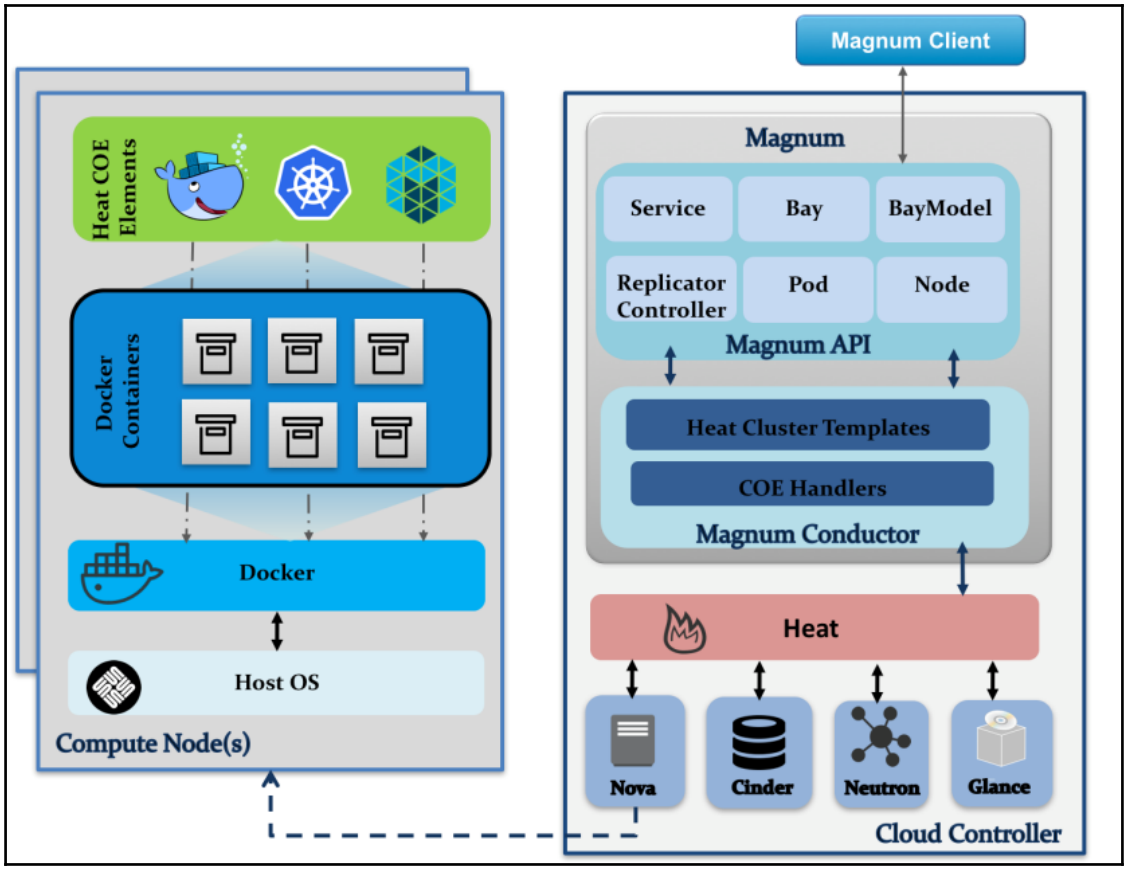
Deploy VNF
VNF Name *
VNF_Demo_Inst01
Description
VNF Catalog Name
VNF-Demo
VNFD template Source
File
TOSCA Template File
Choose file
No file chosen
VIM Name
ExtendCloud

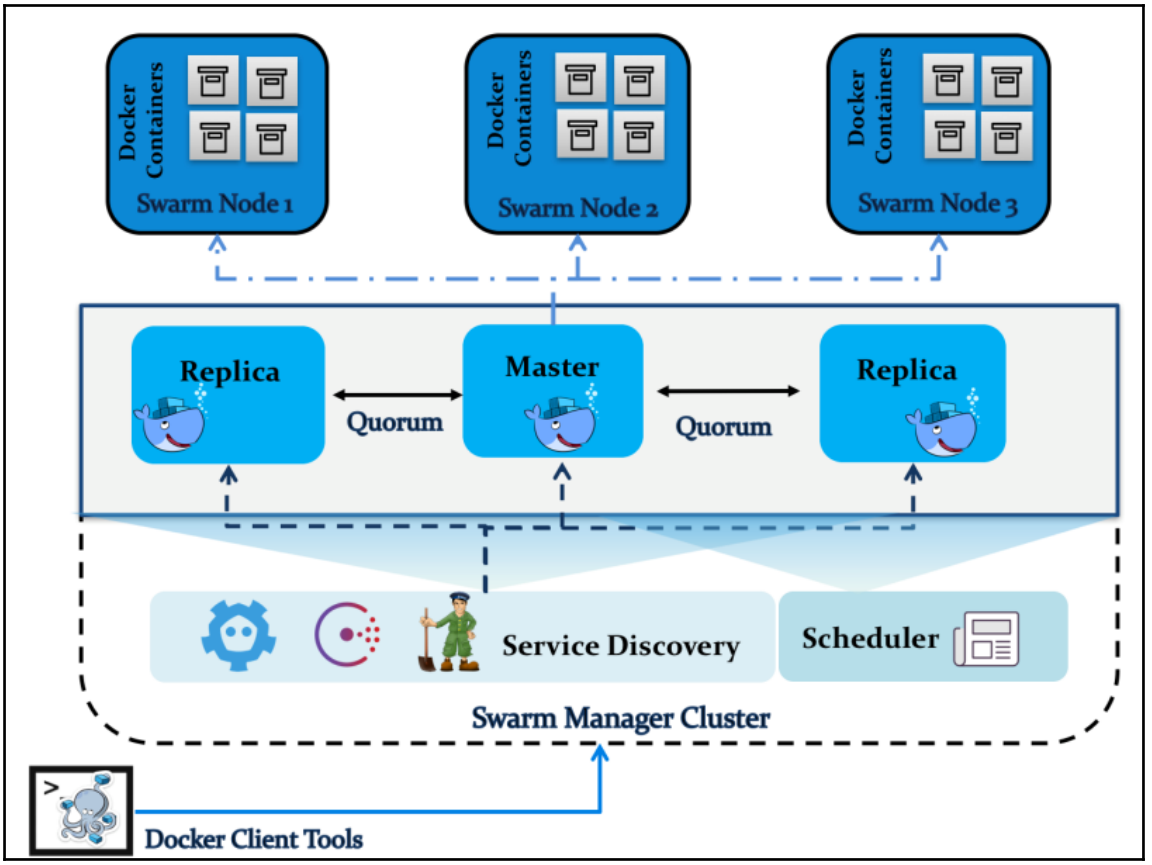

VNF Manager
Filter
+ Deploy VNF
Terminate VNFs
Displaying 1 item | Next »
VNF Name
Description
Deployed Services
VIM
Status
Error Reason
VNF_Demo_Inst01
Demo example
ExtendCloud
PENDING_CREATE
-
Displaying 1 item | Next »

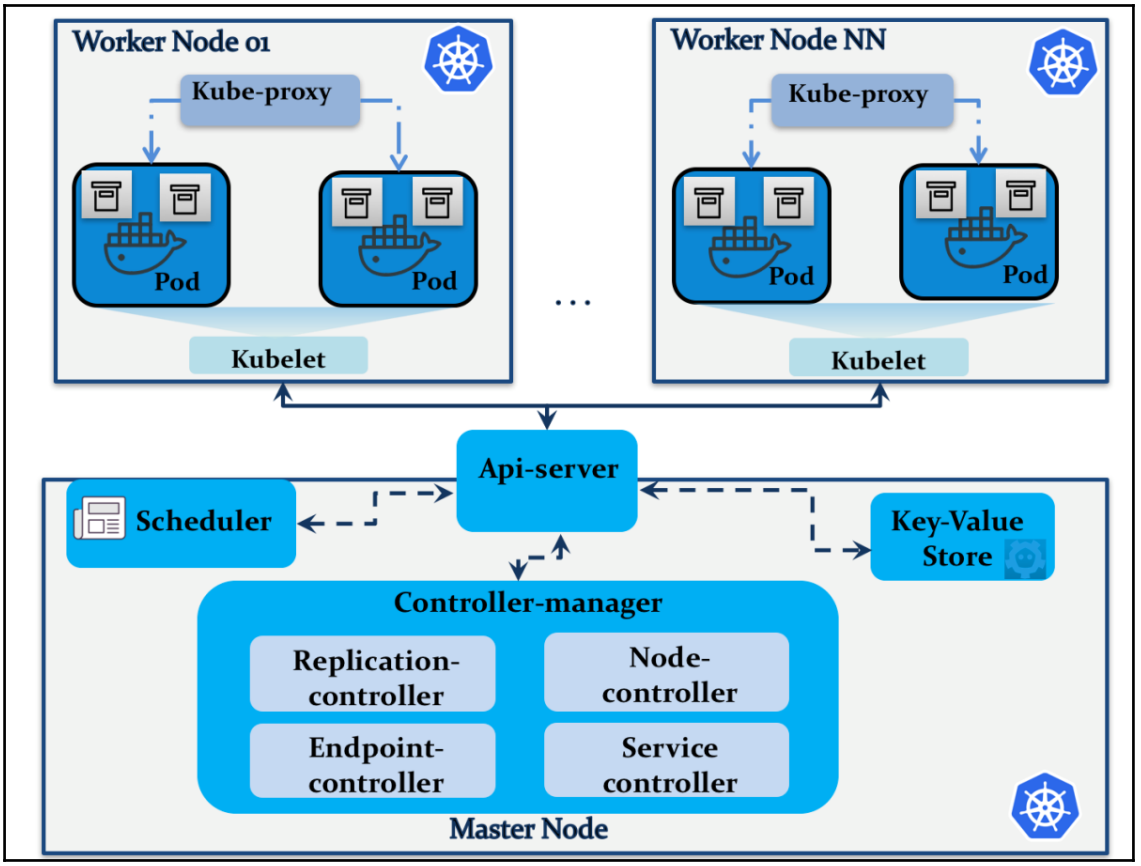
services
-
ta-d88f-f3d2-49c1-862e-ab4627e8f8d2-VDU1-ssxz2idpbvds
cirros
tacker.vnfm.infra_drivers.openstack.openstack_OpenStack-18abd88f-f3d2-49c1-862e-ab4627e8f8d2-VDU1_flavor-75w2vxhh7psz
Build
Scheduling
No State
1 minute
Edit Instance

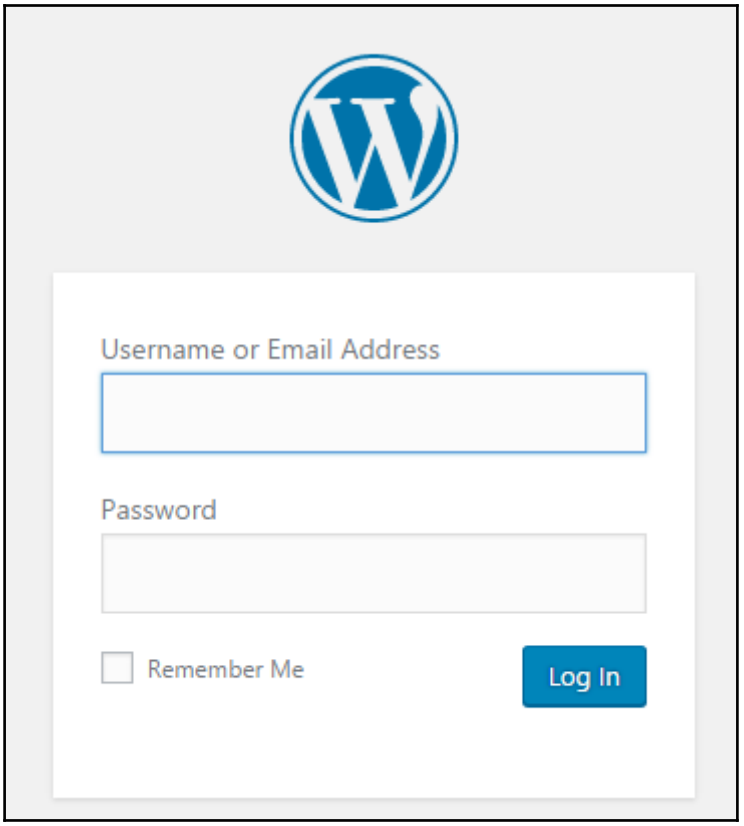
Chapter 5: Containerizing in OpenStack

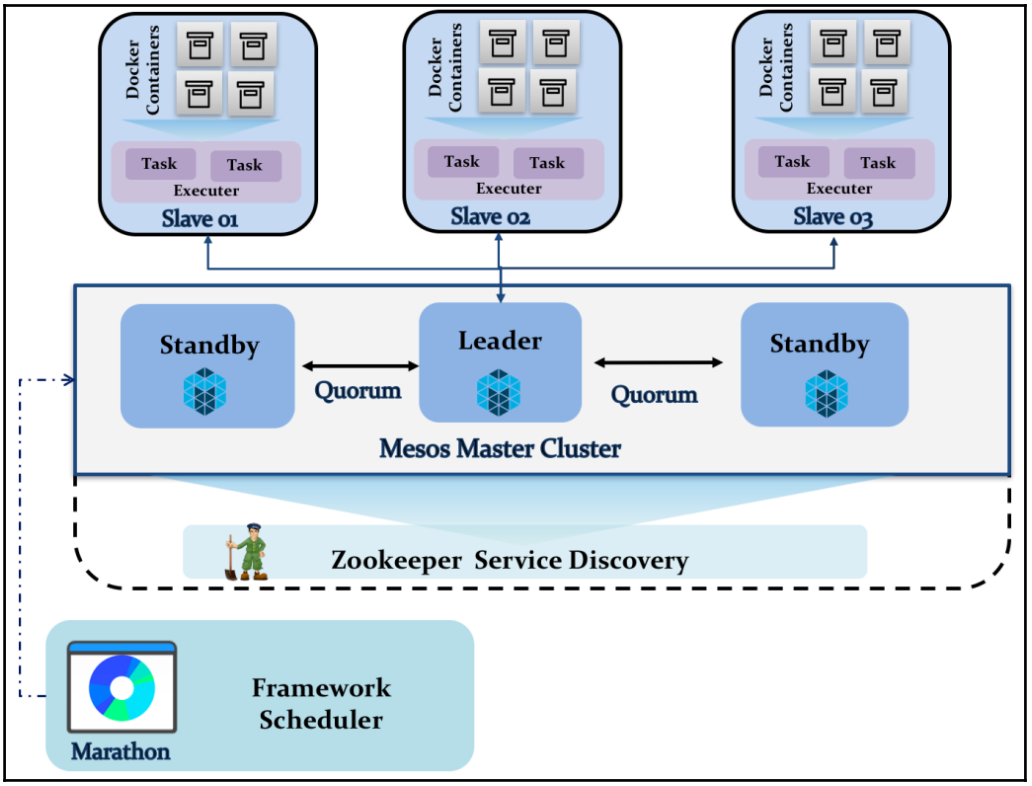


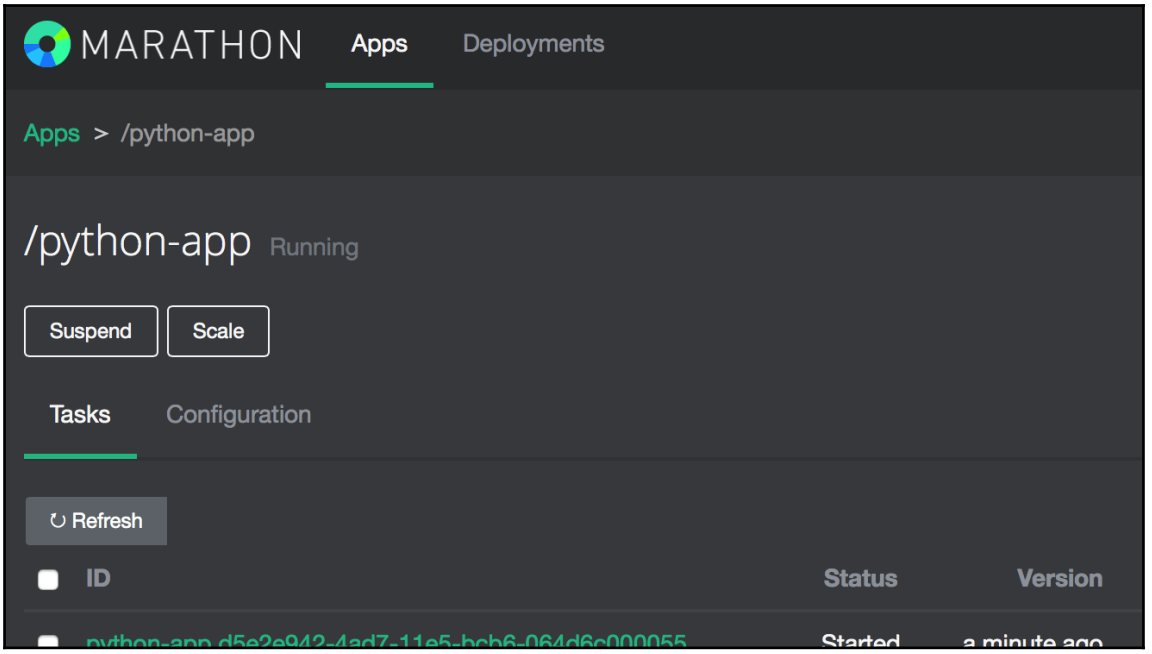

Magnum Client
Magnum
Service
Bay
BayModel
Replicator Controller
Pod
Node
Magnum API
Heat Cluster Templates
COE Handlers
Magnum Conductor
Heat
Nova
Cinder
Neutron
Glance
Cloud Controller
Heat COE Elements
Docker Containers
Docker
Host OS
Compute Node(s)


Docker Containers
Swarm Node 1
Docker Containers
Swarm Node 2
Docker Containers
Swarm Node 3
Replica
Quorum
Master
Quorum
Replica
Service Discovery
Scheduler
Swarm Manager Cluster
Docker Client Tools

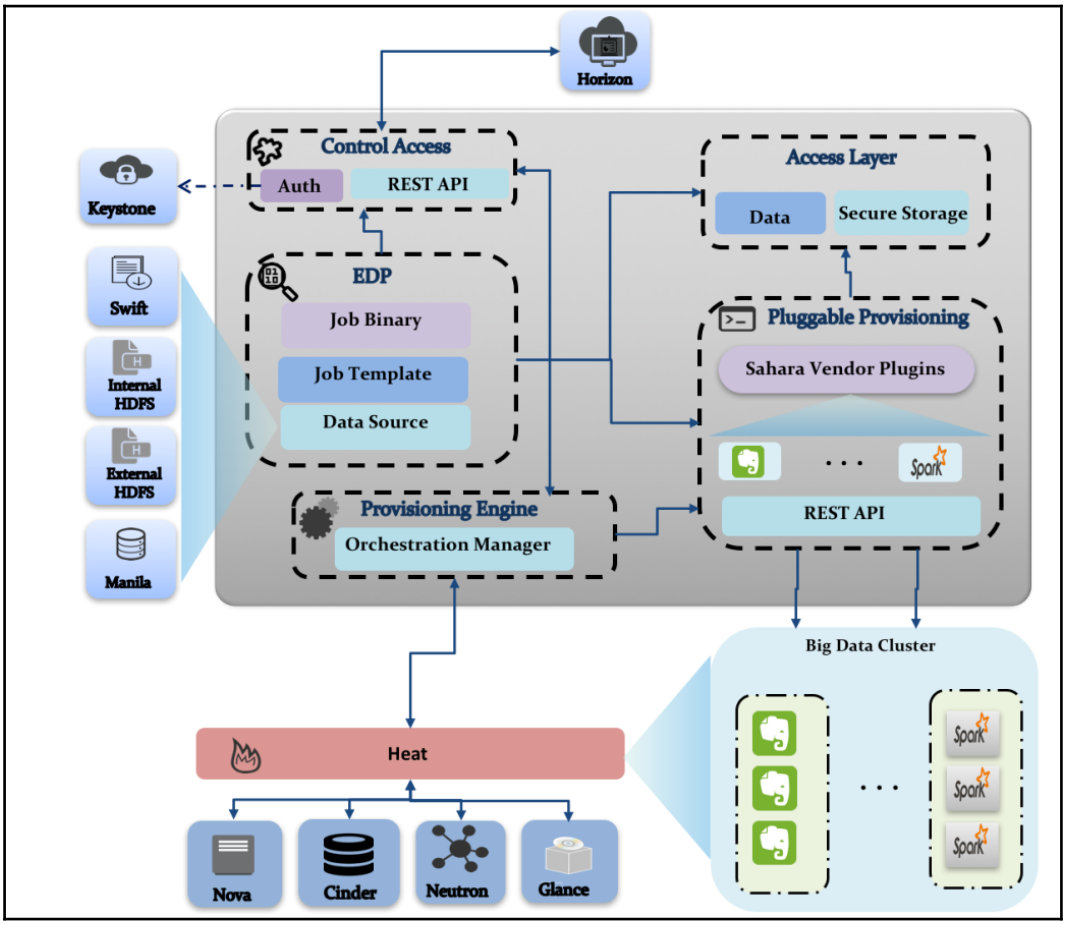

Worker Node 01
Kube-proxy
Pod
Pod
Kubelet
Worker Node NN
Kube-proxy
Pod
Pod
Kubelet
Api-server
Scheduler
Key-Value Store
Controller-manager
Replication-controller
Node-controller
Endpoint-controller
Service controller
Master Node

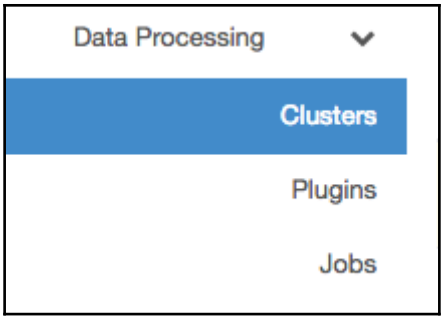

Username or Email Address
Password
Remember Me
Log In

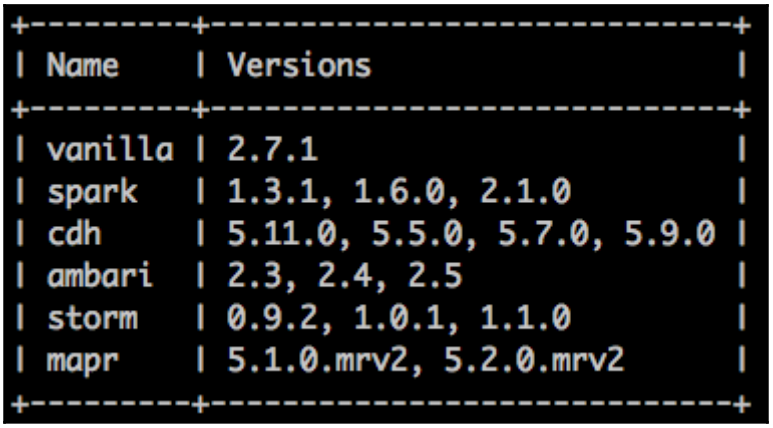

Docker Containers
Task
Task
Executer
Slave 01
Docker Containers
Task
Task
Executer
Slave 02
Docker Containers
Task
Task
Executer
Slave 03
Standby
Quorum
Leader
Quorum
Standby
Mesos Master Cluster
Zookeeper Service Discovery
Framework Scheduler
Marathon


MARATHON
Apps
Deployments
Apps > /python-app
/python-app Running
Suspend
Scale
Tasks
Configuration
↻ Refresh
ID
Status
Version
Started
a minute ago

Chapter 6: Managing Big Data in OpenStack







```
+---------+-----------------------------+
| Name    | Versions                    |
+---------+-----------------------------+
| vanilla | 2.7.1                       |
| spark   | 1.3.1, 1.6.0, 2.1.0         |
| cdh     | 5.11.0, 5.5.0, 5.7.0, 5.9.0 |
| ambari  | 2.3, 2.4, 2.5               |
| storm   | 0.9.2, 1.0.1, 1.1.0         |
| mapr    | 5.1.0.mrv2, 5.2.0.mrv2      |
+---------+-----------------------------+
```

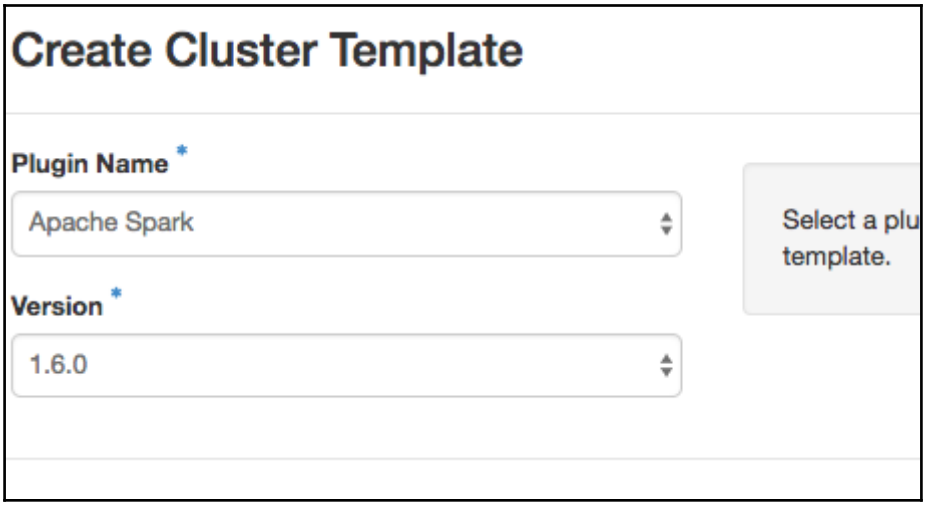
```
venv installed: Babel==2.5.1,bashate==0.5.1,decorator==4.1.2,dib-utils==0.0.11,diskimage-builder==2.9.0,flake8==2.5.5,hacking==0.12.0
.3,PyYAML==3.12,-e git+https://github.com/openstack/sahara-image-elements@2a0fa0d58b0dbfe56f09355e0eb1f8caae43aa15#egg=sahara_image_e
venv runtests: PYTHONHASHSEED='2883751908'
venv runtests: commands[0] | sahara-image-create -u -p spark -v 1.6 -i ubuntu
Spark version not specified
Spark 2.2.0 will be used
package no package provides qemu-kvm is not installed
Retrieving http://dl.fedoraproject.org/pub/epel/6/x86_64/epel-release-6-8.noarch.rpm
warning: /var/tmp/rpm-tmp.MoJaIQ: Header V3 RSA/SHA256 Signature, key ID 0608b895: NOKEY
Preparing...                ########################################### [100%]
Updating / installing...
   1:epel-release-6-8       ########################################### [100%]
Loaded plugins: fastestmirror
```

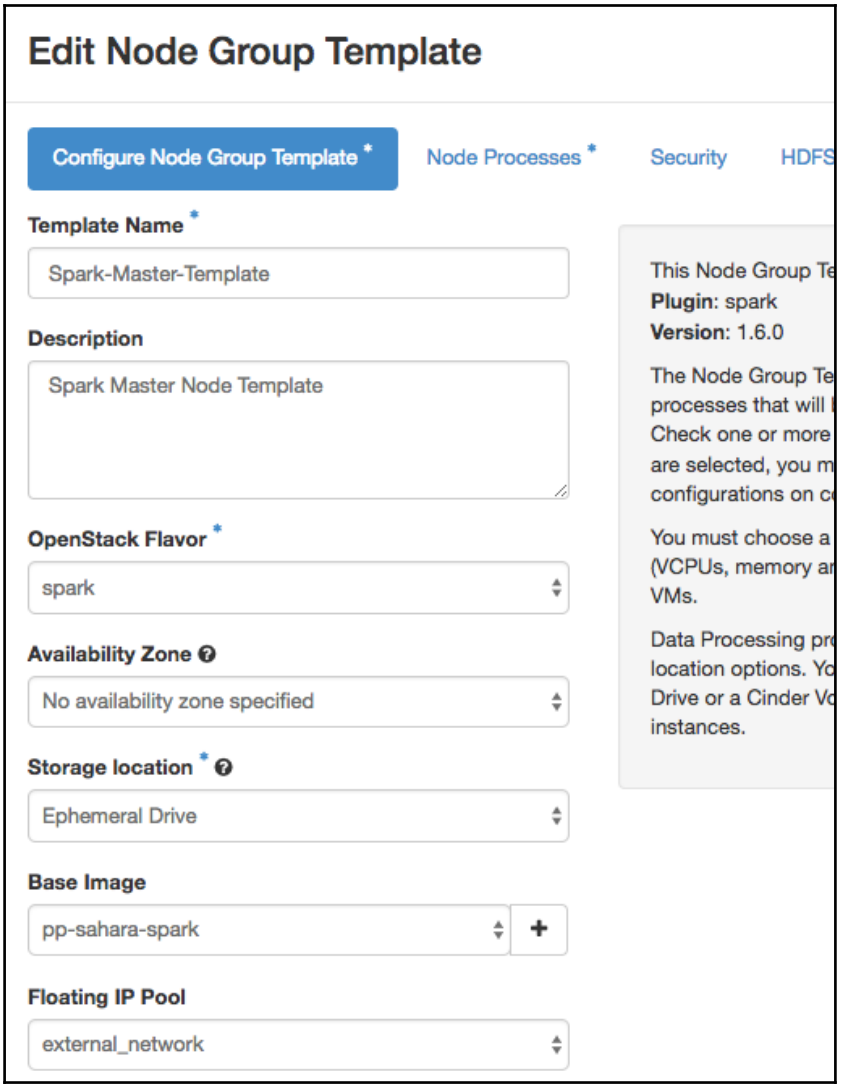
```
2017-12-25 23:10:19.120 INFO diskimage_builder.block_device.blockdevic
Converting image using qemu-img convert
Image file ubuntu_sahara_spark_latest.qcow2 created...
_____________________________________________________________________
  venv: commands succeeded
  congratulations :)
```

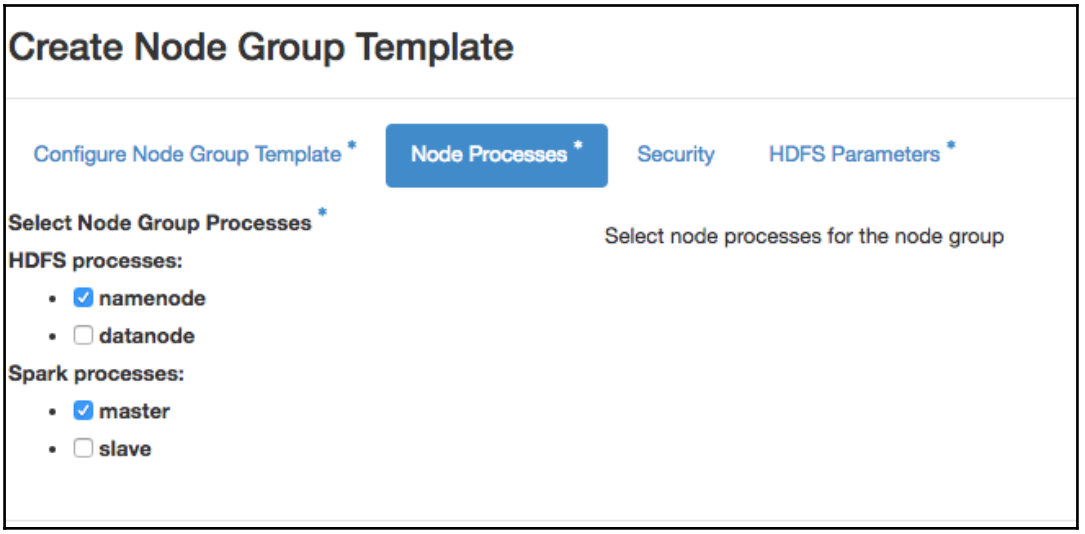
Property	Value
checksum	076a15b96ce95546812a8cde5b394f69
container_format	bare
created_at	2017-12-25T23:15:40Z
disk_format	qcow2
id	54ef8e7c-1526-48c1-bef3-fb56dc45dcd8
min_disk	0
min_ram	0
name	pp-sahara-spark
owner	72c9f0b3319f45dc81b9bf4beeac497e
protected	False
size	1058078720
status	active
tags	[]
updated_at	2017-12-25T23:15:48Z
virtual_size	None
visibility	shared

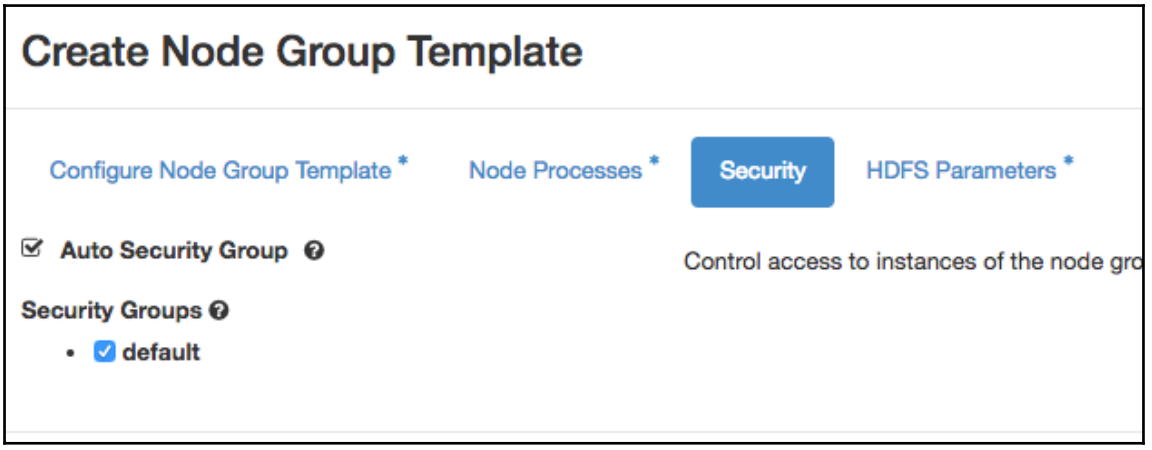
Field	Value
Description	Sahara Image Spark Ubuntu PP
Id	54ef8e7c-1526-48c1-bef3-fb56dc45dcd8
Name	pp-sahara-spark
Status	ACTIVE
Tags	
Username	ubuntu

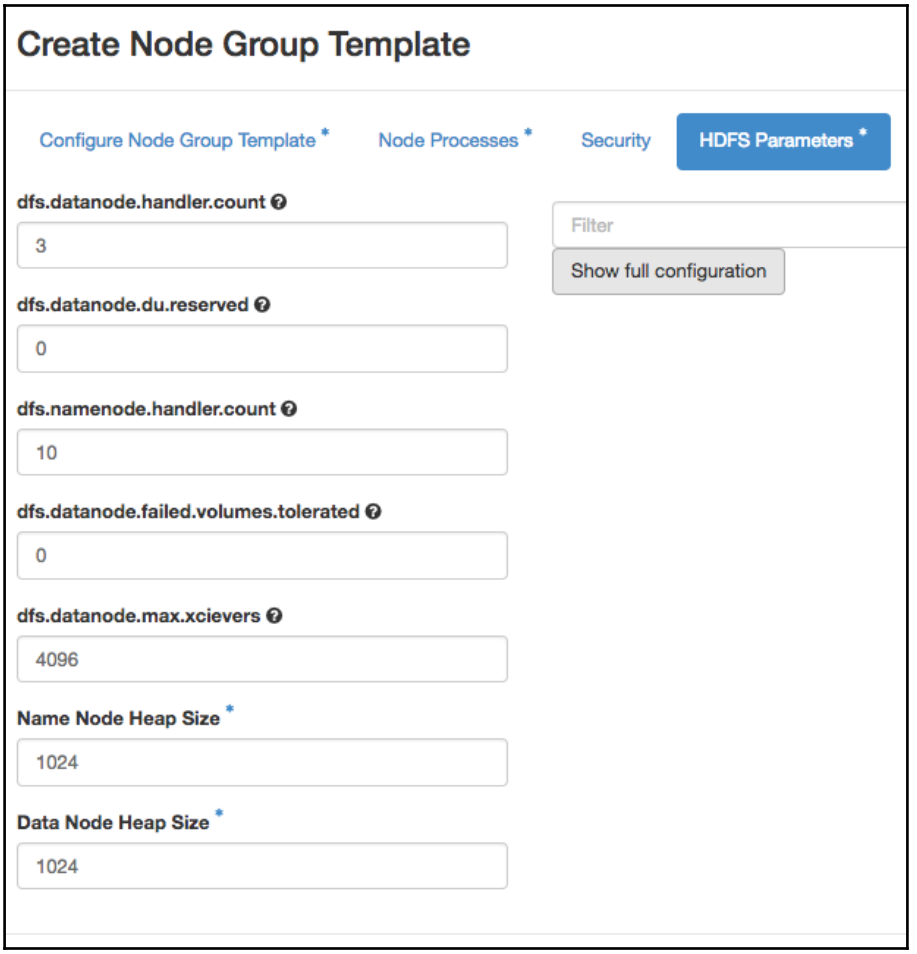
Name	pp-sahara-spark
Status	ACTIVE
Tags	1.6, spark

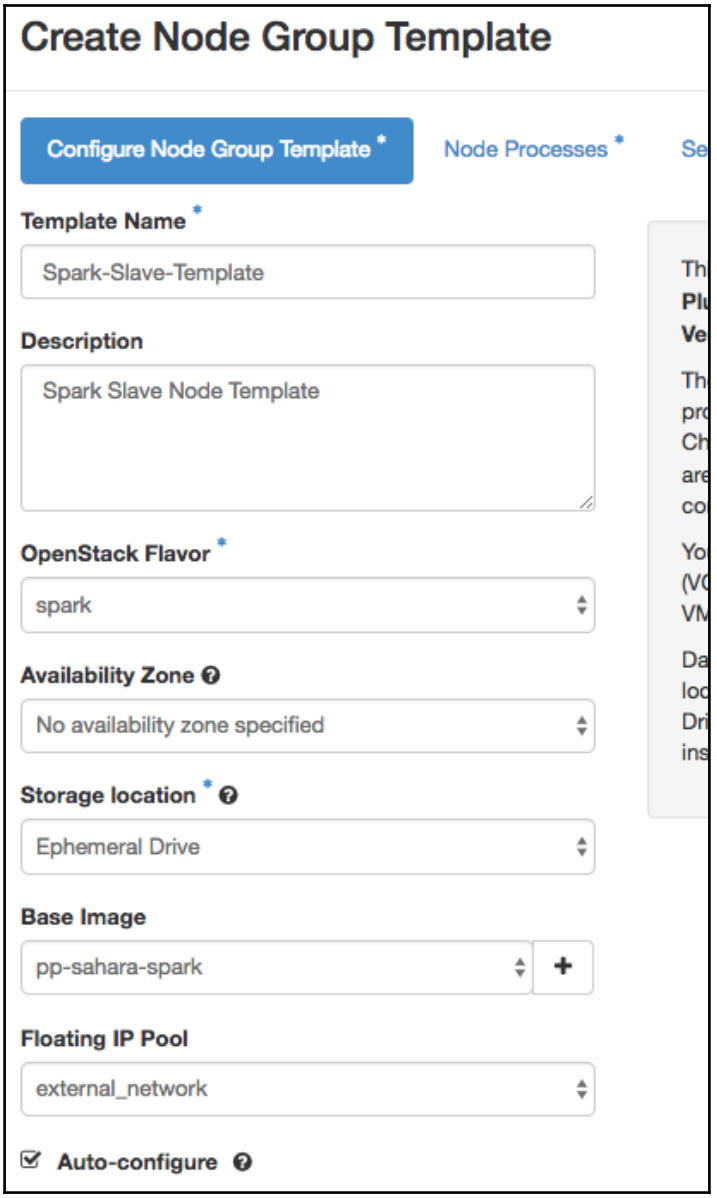

Create Cluster Template
Plugin Name *
Apache Spark
Version *
1.6.0
Select a plu
template.

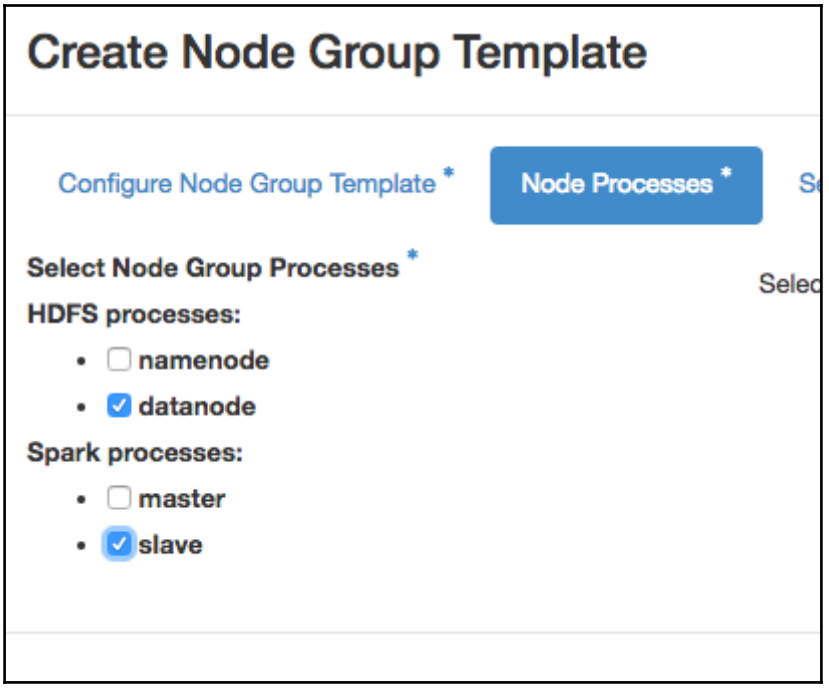

Edit Node Group Template
Configure Node Group Template *
Node Processes *
Security
HDFS
Template Name *
Spark-Master-Template
Description
Spark Master Node Template
OpenStack Flavor *
spark
Availability Zone
No availability zone specified
Storage location *
Ephemeral Drive
Base Image
pp-sahara-spark
Floating IP Pool
external_network
This Node Group Te
Plugin: spark
Version: 1.6.0
The Node Group Te
processes that will
Check one or more
are selected, you m
configurations on c
You must choose a
(VCPUs, memory ar
VMs.
Data Processing pr
location options. Yo
Drive or a Cinder Vo
instances.

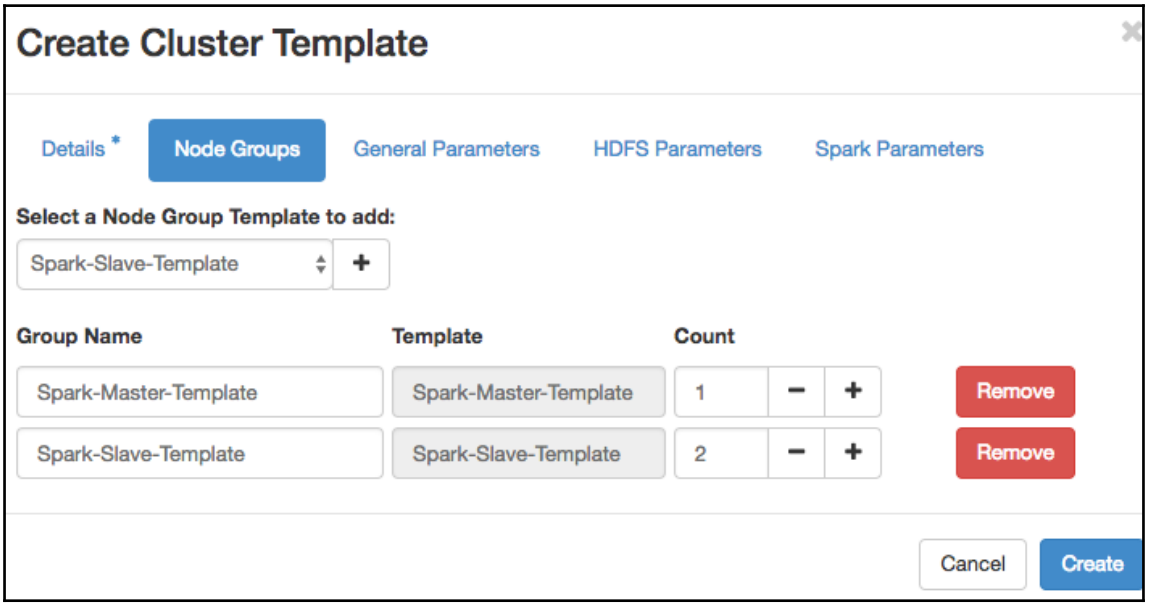

Create Node Group Template
Configure Node Group Template *
Node Processes *
Security
HDFS Parameters *
Select Node Group Processes *
Select node processes for the node group
HDFS processes:
namenode
datanode
Spark processes:
master
slave


Create Node Group Template
Configure Node Group Template *
Node Processes *
Security
HDFS Parameters *
Auto Security Group
Control access to instances of the node gro
Security Groups
default

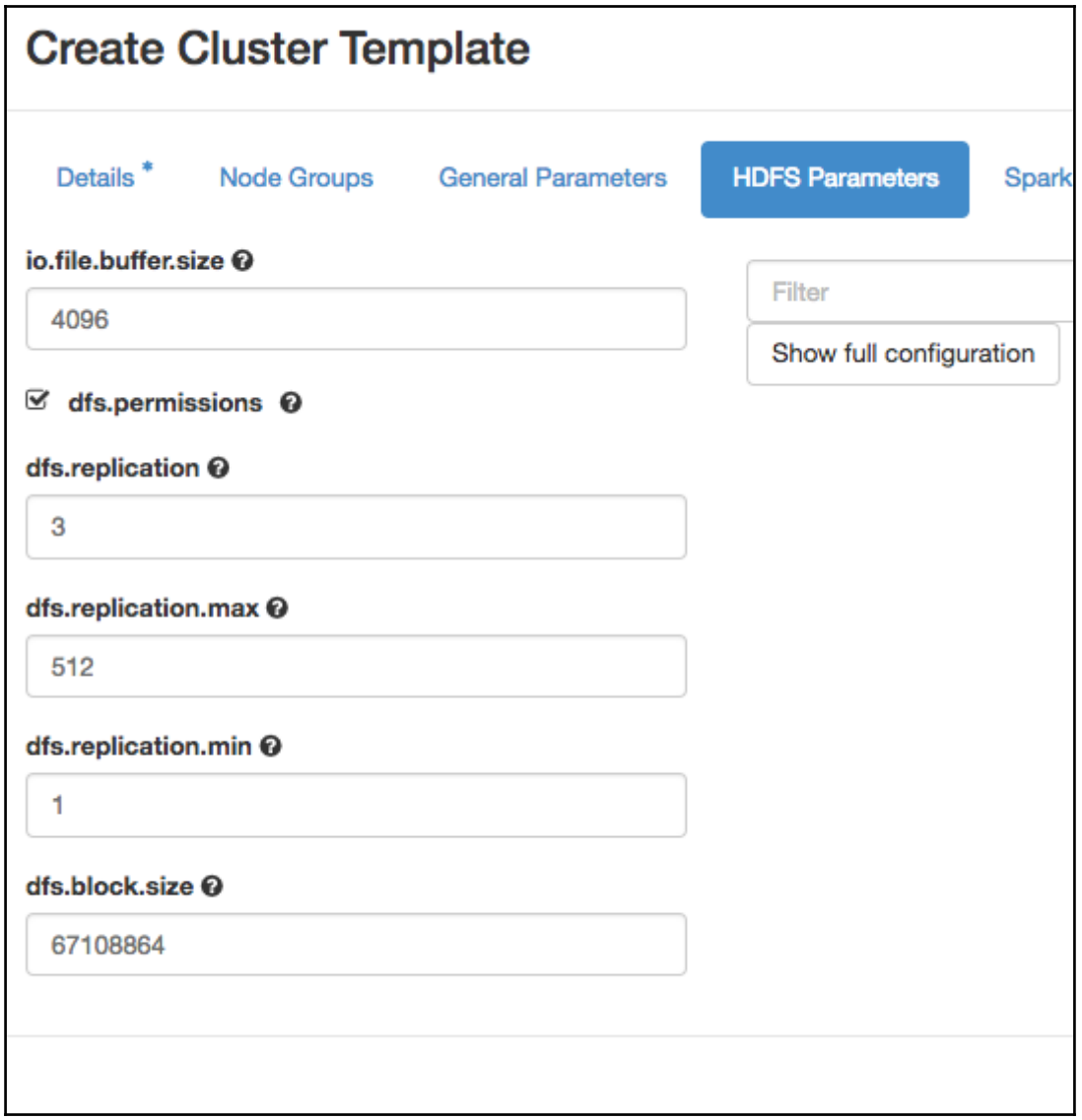

Create Node Group Template
Configure Node Group Template *
Node Processes *
Security
HDFS Parameters *
dfs.datanode.handler.count
3
dfs.datanode.du.reserved
0
dfs.namenode.handler.count
10
dfs.datanode.failed.volumes.tolerated
0
dfs.datanode.max.xcievers
4096
Name Node Heap Size *
1024
Data Node Heap Size *
1024
Filter
Show full configuration

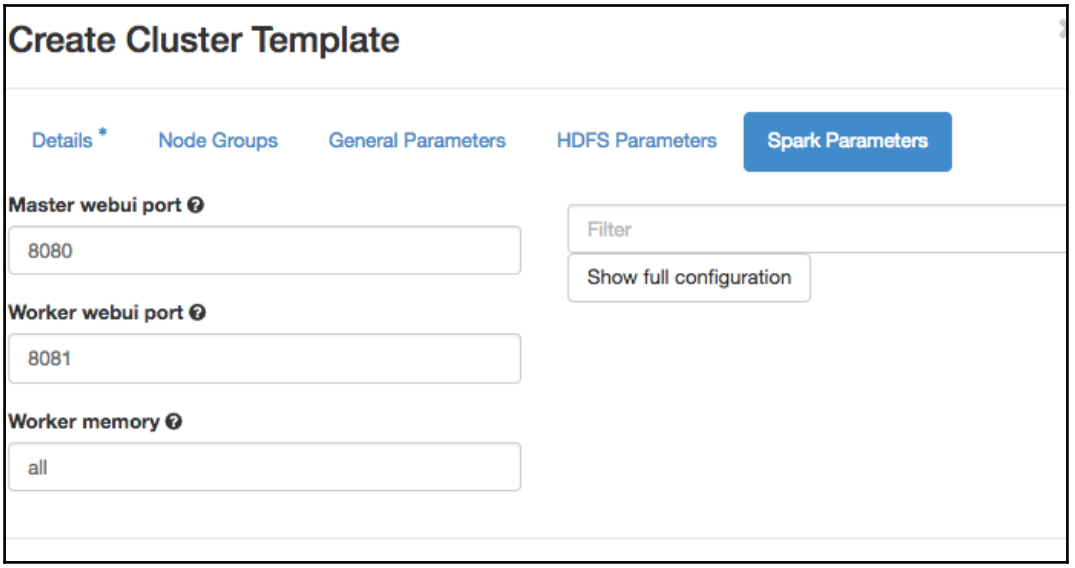

Create Node Group Template
Configure Node Group Template *
Node Processes *
Template Name *
Spark-Slave-Template
Description
Spark Slave Node Template
OpenStack Flavor *
spark
Availability Zone
No availability zone specified
Storage location *
Ephemeral Drive
Base Image
pp-sahara-spark
Floating IP Pool
external_network
Auto-configure

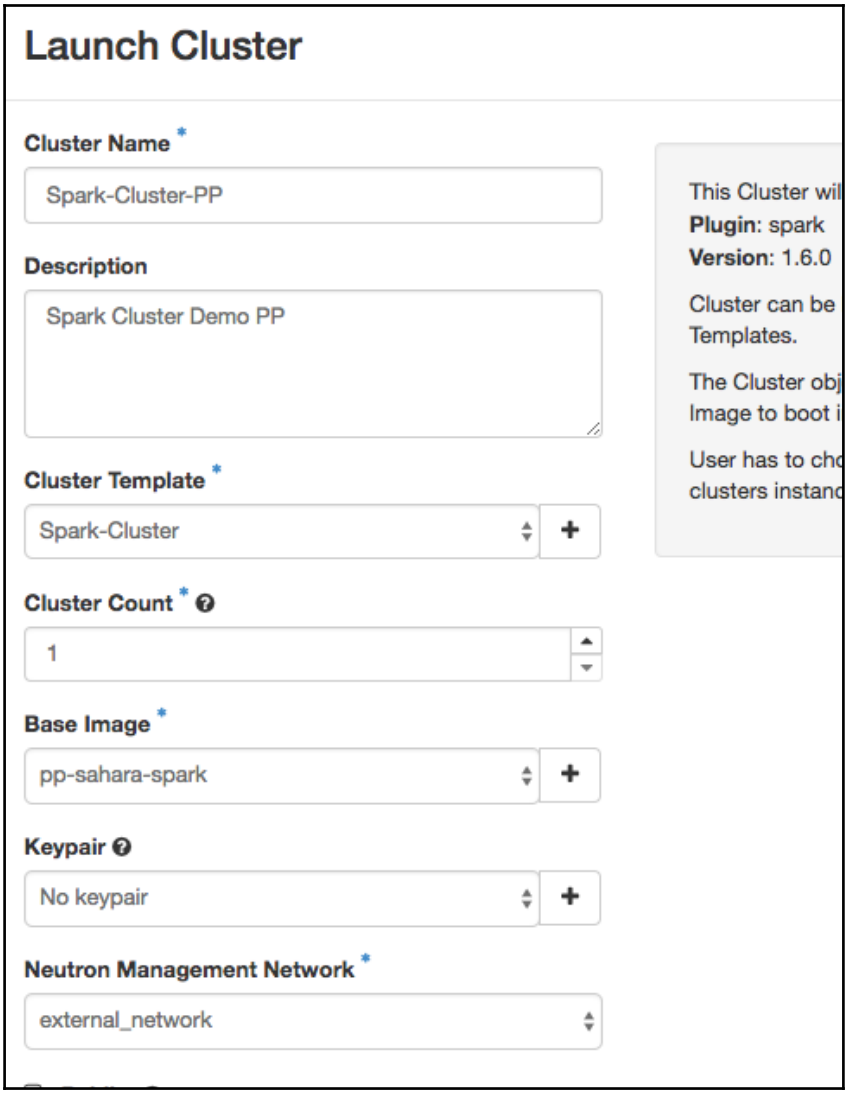

Create Node Group Template
Configure Node Group Template *
Node Processes *
Select Node Group Processes *
HDFS processes:
namenode
datanode
Spark processes:
master
slave

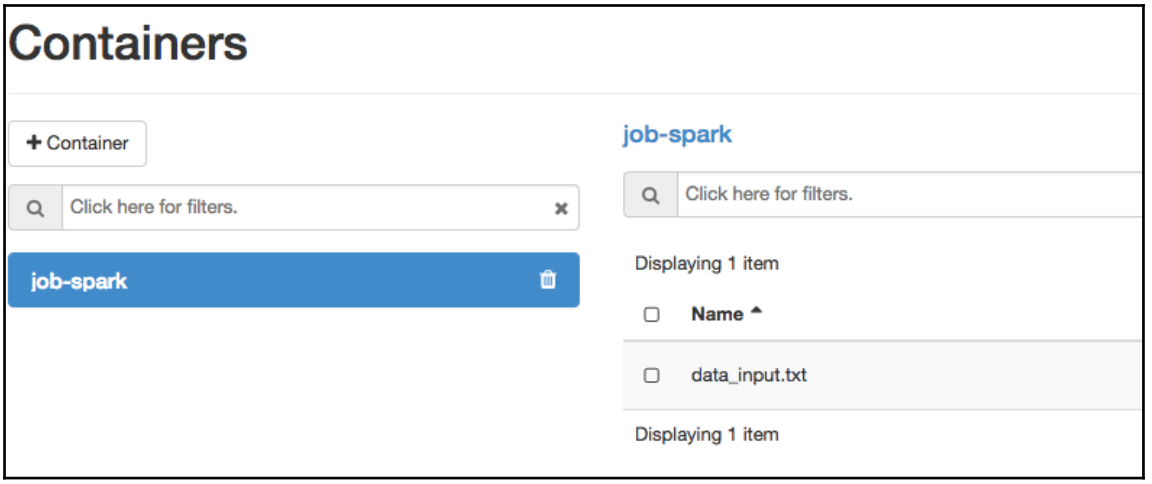

Create Cluster Template
Details *
Node Groups
General Parameters
HDFS Parameters
Spark Parameters
Select a Node Group Template to add:
Spark-Slave-Template
Group Name
Template
Count
Spark-Master-Template
Spark-Master-Template
1
Remove
Spark-Slave-Template
Spark-Slave-Template
2
Remove
Cancel
Create

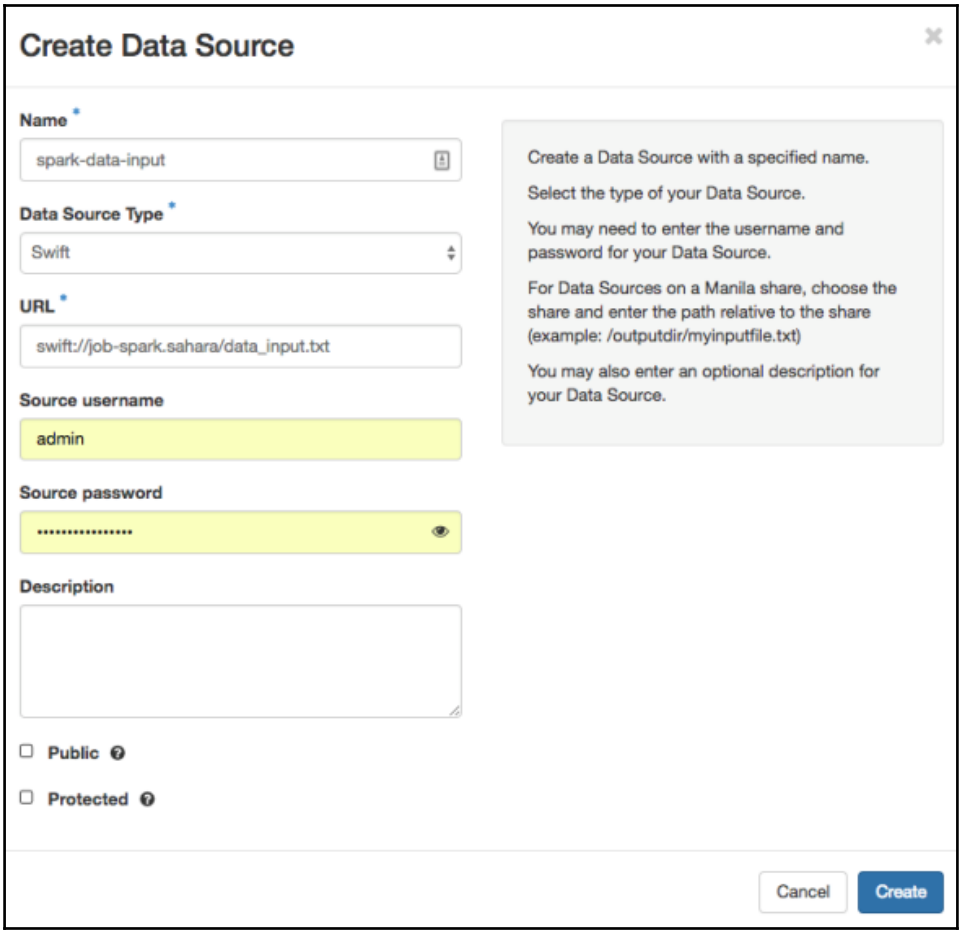
Create Cluster Template
Details *
Node Groups
General Parameters
HDFS Paramet
Timeout for disk preparing
300
Filter
Show full c
Enable NTP service
URL of NTP server
Heat Wait Condition timeout
3600
Enable XFS
Decommissioning Timeout
86400
Enable Swift
DataNodes startup timeout
10800

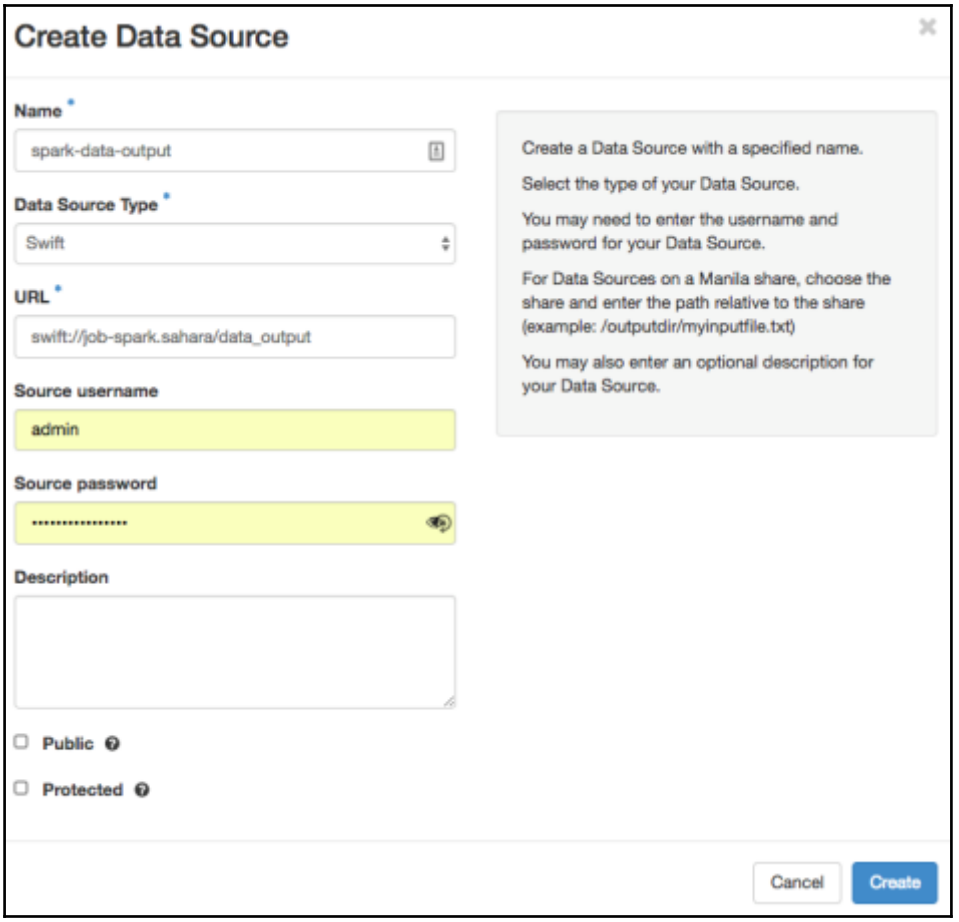

Create Cluster Template
Details *
Node Groups
General Parameters
HDFS Parameters
Spark
io.file.buffer.size
4096
Filter
Show full configuration
dfs.permissions
dfs.replication
3
dfs.replication.max
512
dfs.replication.min
1
dfs.block.size
67108864

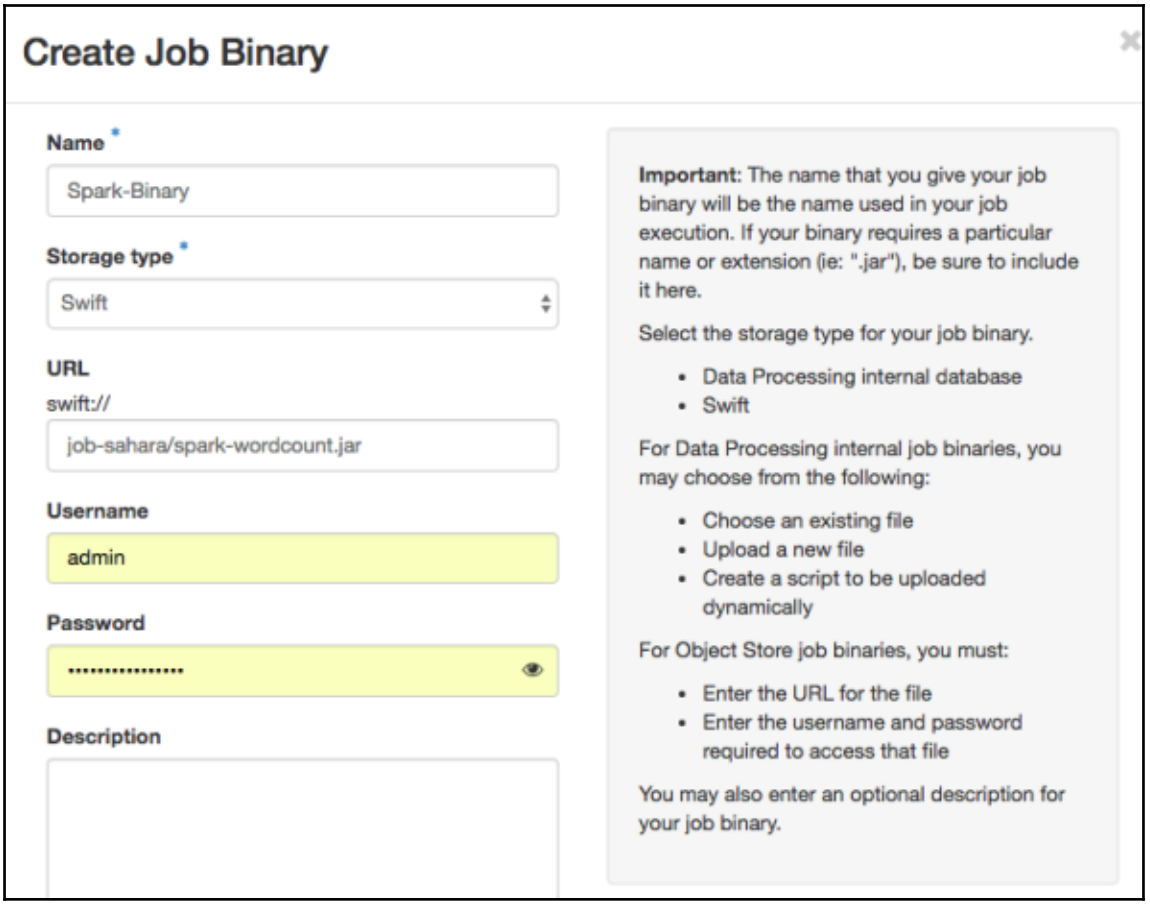

Create Cluster Template
Details *
Node Groups
General Parameters
HDFS Parameters
Spark Parameters
Master webui port
8080
Worker webui port
8081
Worker memory
all
Filter
Show full configuration

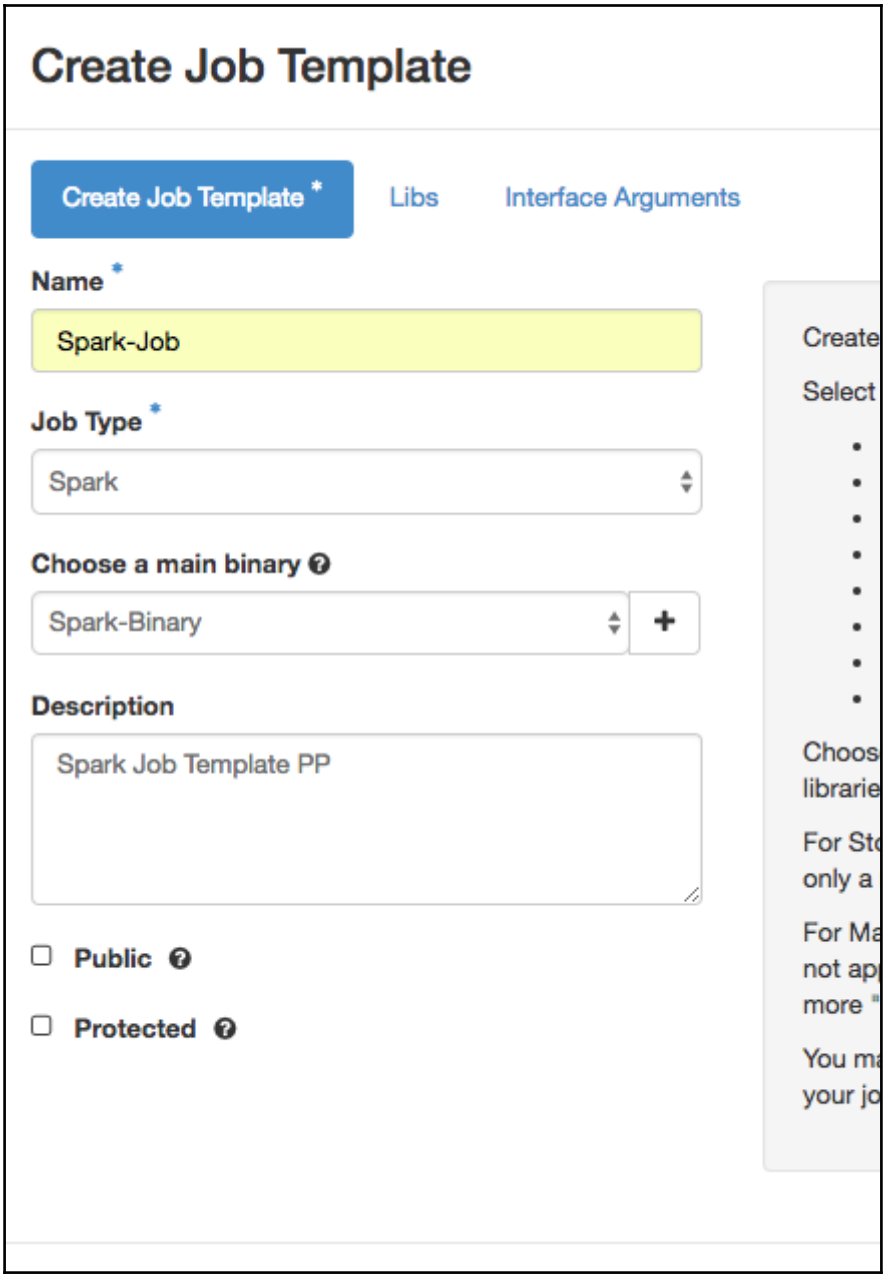

Launch Cluster
Cluster Name *
Spark-Cluster-PP
Description
Spark Cluster Demo PP
Cluster Template *
Spark-Cluster
Cluster Count *
1
Base Image *
pp-sahara-spark
Keypair
No keypair
Neutron Management Network *
external_network
This Cluster wil
Plugin: spark
Version: 1.6.0
Cluster can be
Templates.
The Cluster obj
Image to boot i
User has to cho
clusters instanc

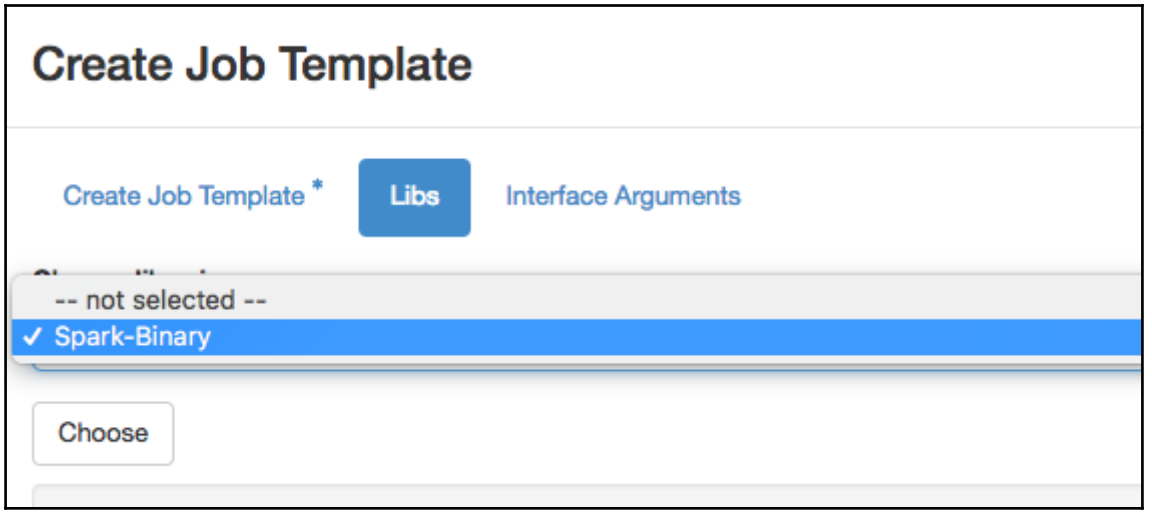

Containers
+ Container
Click here for filters.
job-spark
job-spark
Click here for filters.
Displaying 1 item
Name
data_input.txt
Displaying 1 item

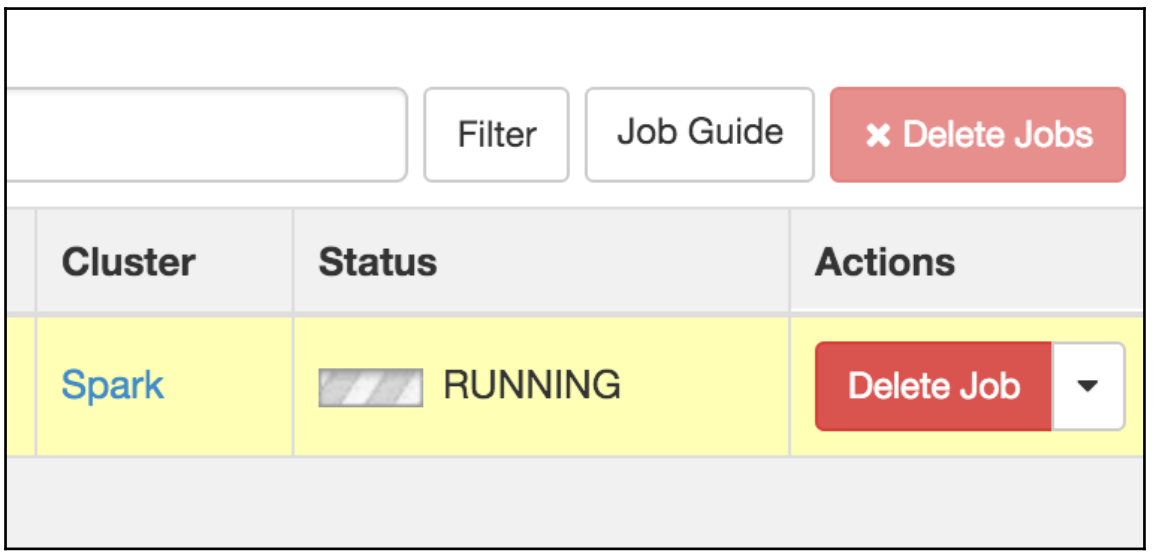

Create Data Source
Name *
spark-data-input
Data Source Type *
Swift
URL *
swift://job-spark.sahara/data_input.txt
Source username
admin
Source password
Description
Public
Protected
Create a Data Source with a specified name.
Select the type of your Data Source.
You may need to enter the username and password for your Data Source.
For Data Sources on a Manila share, choose the share and enter the path relative to the share (example: /outputdir/myinputfile.txt)
You may also enter an optional description for your Data Source.
Cancel
Create


Create Data Source
Name *
spark-data-output
Data Source Type *
Swift
URL *
swift://job-spark.sahara/data_output
Source username
admin
Source password
Description
Public
Protected
Create a Data Source with a specified name.
Select the type of your Data Source.
You may need to enter the username and password for your Data Source.
For Data Sources on a Manila share, choose the share and enter the path relative to the share (example: /outputdir/myinputfile.txt)
You may also enter an optional description for your Data Source.
Cancel
Create

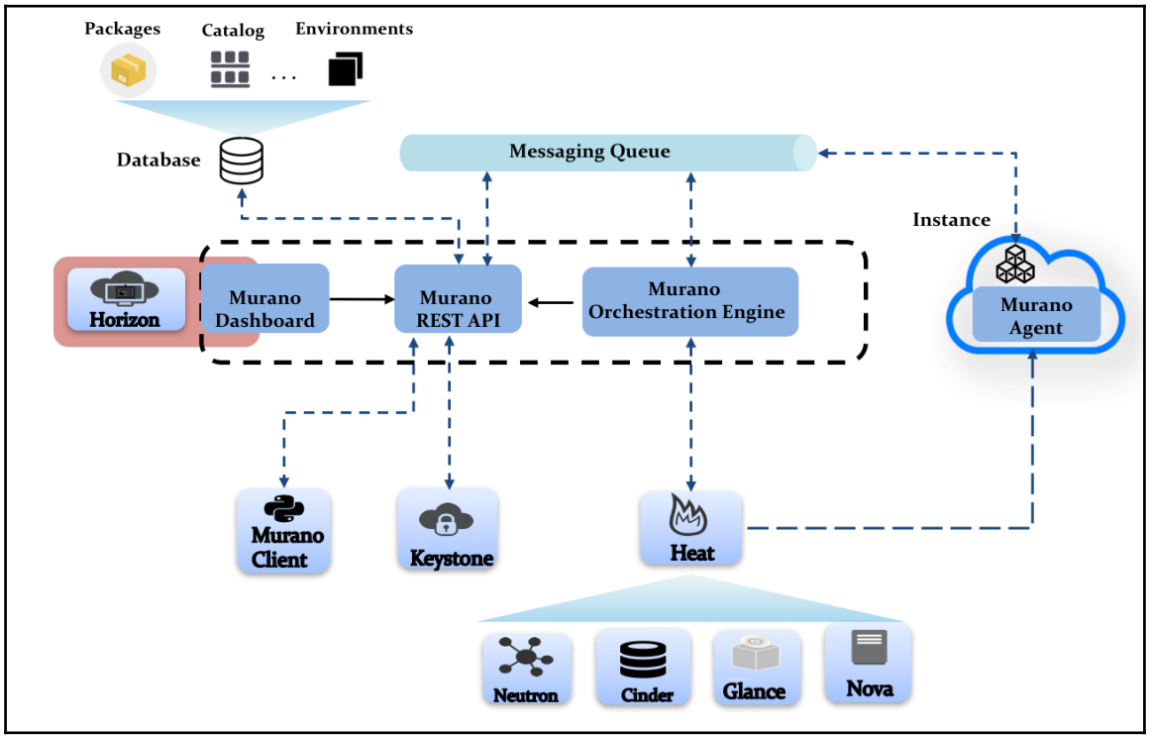

Create Job Binary
Name *
Spark-Binary
Storage type *
Swift
URL
swift://
job-sahara/spark-wordcount.jar
Username
admin
Password
Description
Important: The name that you give your job binary will be the name used in your job execution. If your binary requires a particular name or extension (ie: ".jar"), be sure to include it here.
Select the storage type for your job binary.
Data Processing internal database
Swift
For Data Processing internal job binaries, you may choose from the following:
Choose an existing file
Upload a new file
Create a script to be uploaded dynamically
For Object Store job binaries, you must:
Enter the URL for the file
Enter the username and password required to access that file
You may also enter an optional description for your job binary.


Create Job Template
Create Job Template *
Libs
Interface Arguments
Name *
Spark-Job
Job Type *
Spark
Choose a main binary
Spark-Binary
Description
Spark Job Template PP
Public
Protected
Create
Select
Choos
librarie
For St
only a
For Ma
not ap
more "
You ma
your jo


Create Job Template
Create Job Template *
Libs
Interface Arguments
-- not selected --
Spark-Binary
Choose


Filter
Job Guide
Delete Jobs
Cluster
Status
Actions
Spark
RUNNING
Delete Job

Chapter 7: Evolving Self-Cloud Ready Applications in OpenStack




```
running install_scripts
Installing murano-wsgi-api script to /usr/bin
Installing murano-engine script to /usr/bin
Installing murano-manage script to /usr/bin
Installing murano-cfapi-db-manage script to /usr/bin
Installing murano-cfapi script to /usr/bin
Installing murano-api script to /usr/bin
Installing murano-db-manage script to /usr/bin
Installing murano-test-runner script to /usr/bin
```

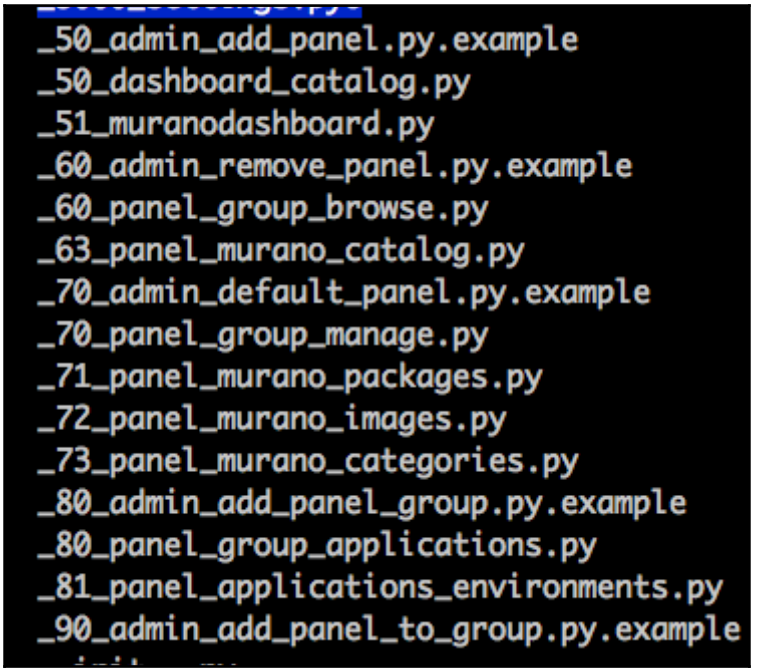
Field	Value
domain_id	default
enabled	True
id	7bc71a126fab468a87b21cd0eacaea0a
name	murano
options	{}
password_expires_at	None

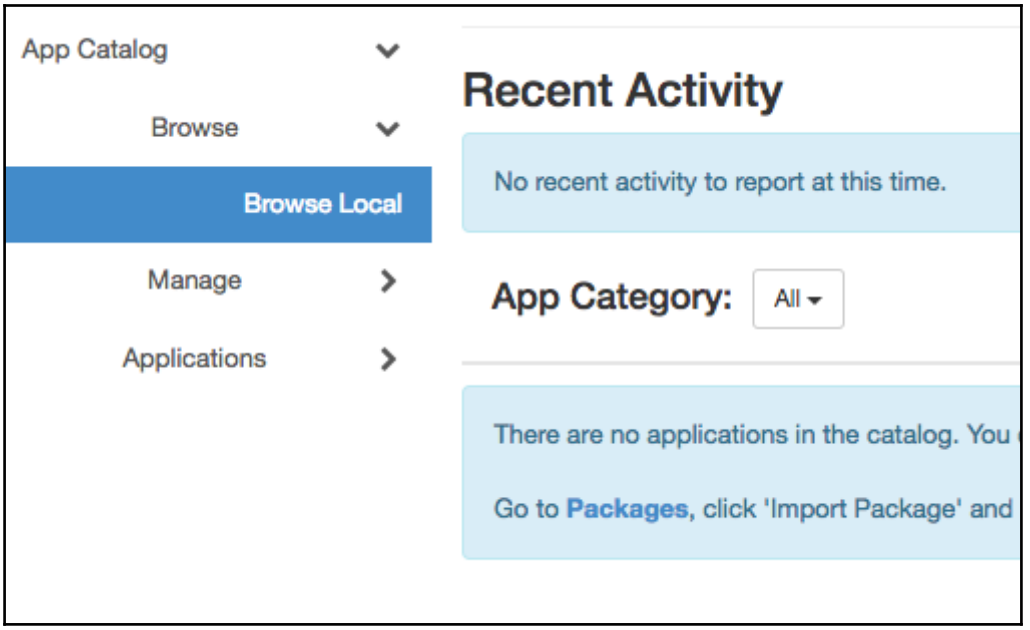
Field	Value
description	Murano APpaaS
enabled	True
id	6df88fa1889e467abab3476b61d0dfbb
name	muranoapi
type	application-catalog

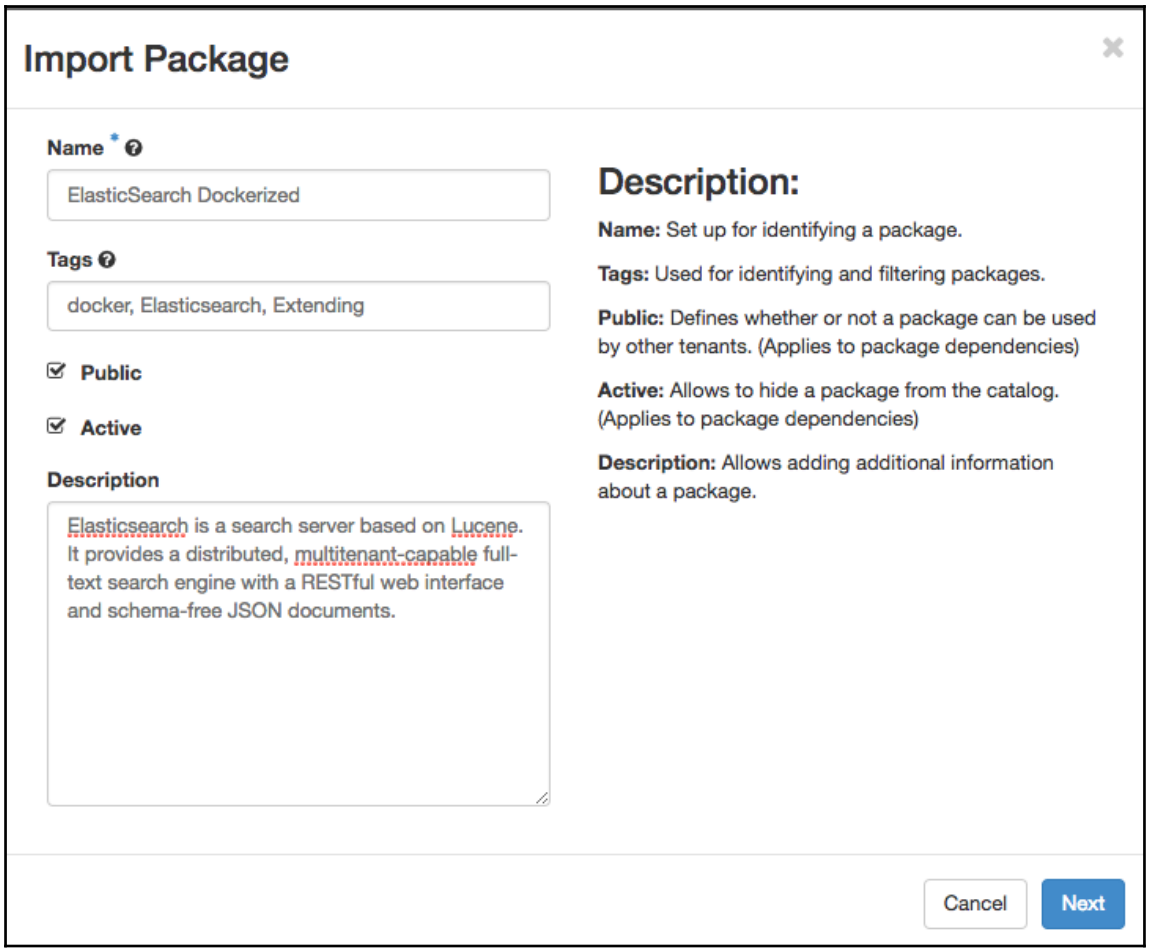
Field	Value
enabled	True
id	2d69634f8ba14e2eae5fe3fba18d02bb
interface	admin
region	RegionOne
region_id	RegionOne
service_id	6df88fa1889e467abab3476b61d0dfbb
service_name	muranoapi
service_type	application-catalog
url	http://10.10.248.12:8082/

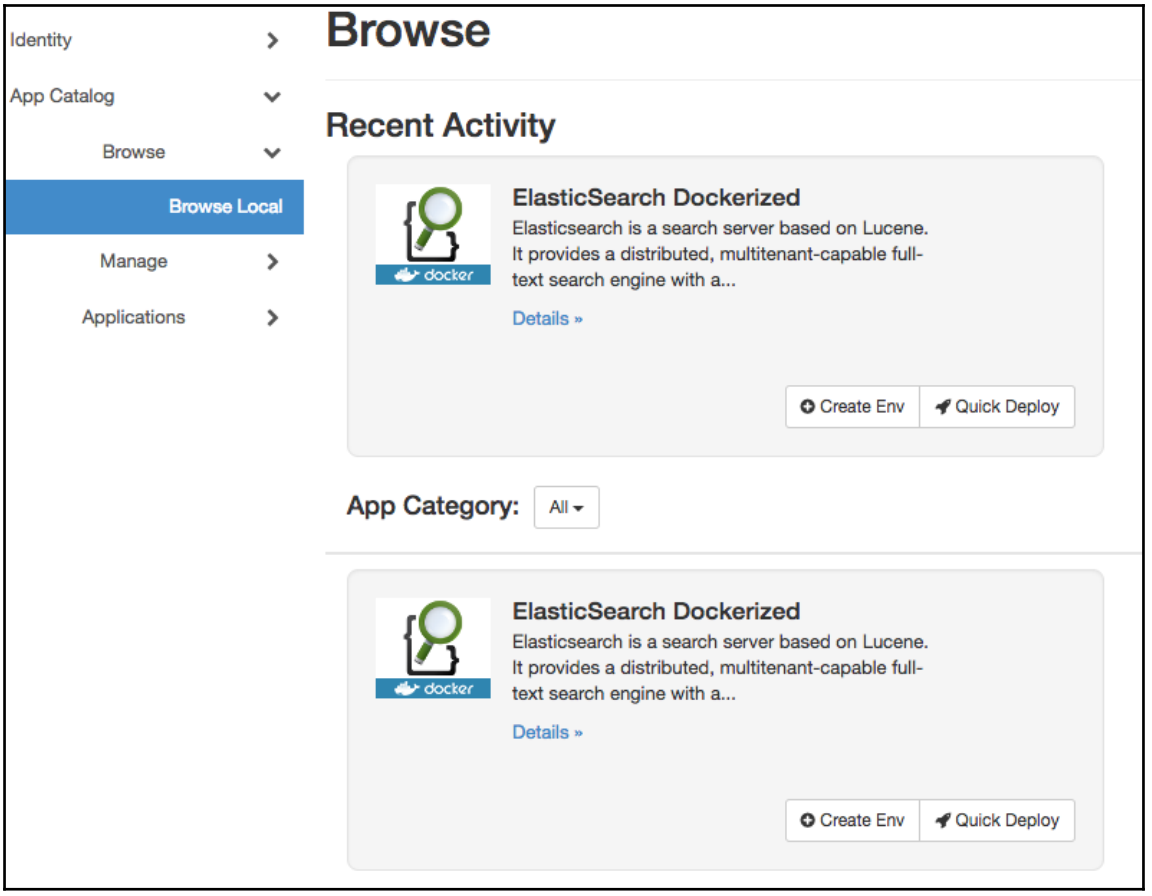
Field	Value
enabled	True
id	c6fb9f5ae76345f3a39f5b14aa25949f
interface	internal
region	RegionOne
region_id	RegionOne
service_id	6df88fa1889e467abab3476b61d0dfbb
service_name	muranoapi
service_type	application-catalog
url	http://10.10.248.12:8082/

Field	Value
enabled	True
id	a1b650a5c18f439488ffcc2e16aa59ab
interface	public
region	RegionOne
region_id	RegionOne
service_id	6df88fa1889e467abab3476b61d0dfbb
service_name	muranoapi
service_type	application-catalog
url	http://10.10.248.12:8082/



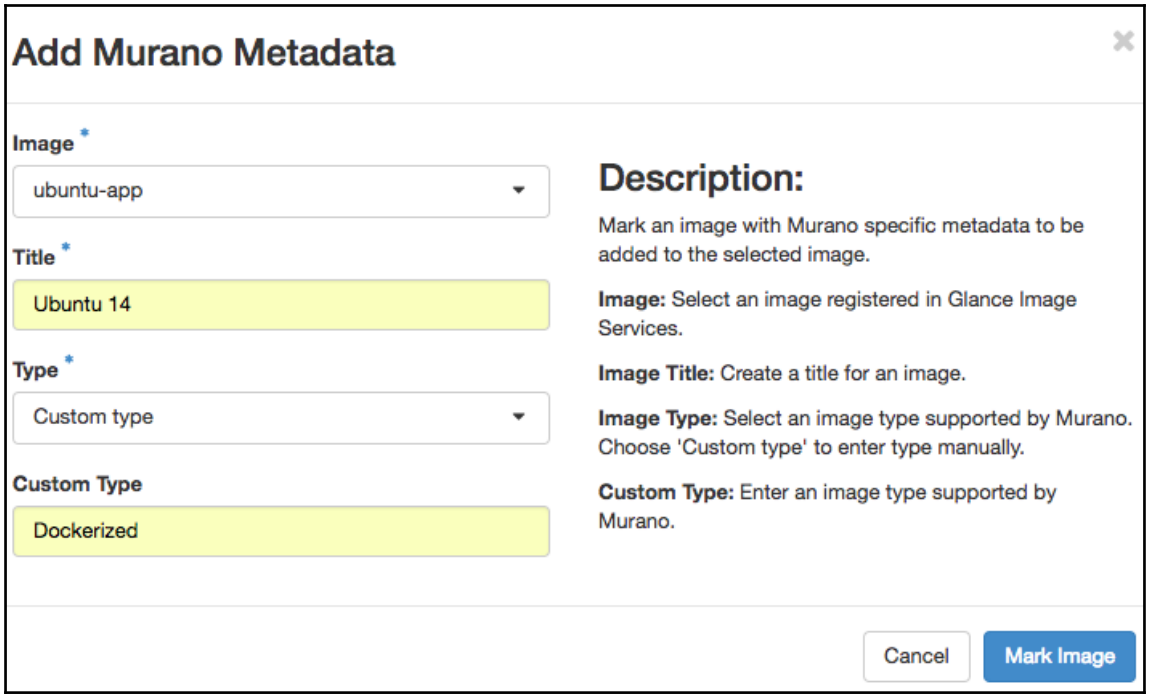

App Catalog
Browse
Browse Local
Manage
Applications
Recent Activity
No recent activity to report at this time.
App Category:
All
There are no applications in the catalog. You
Go to Packages, click 'Import Package' and

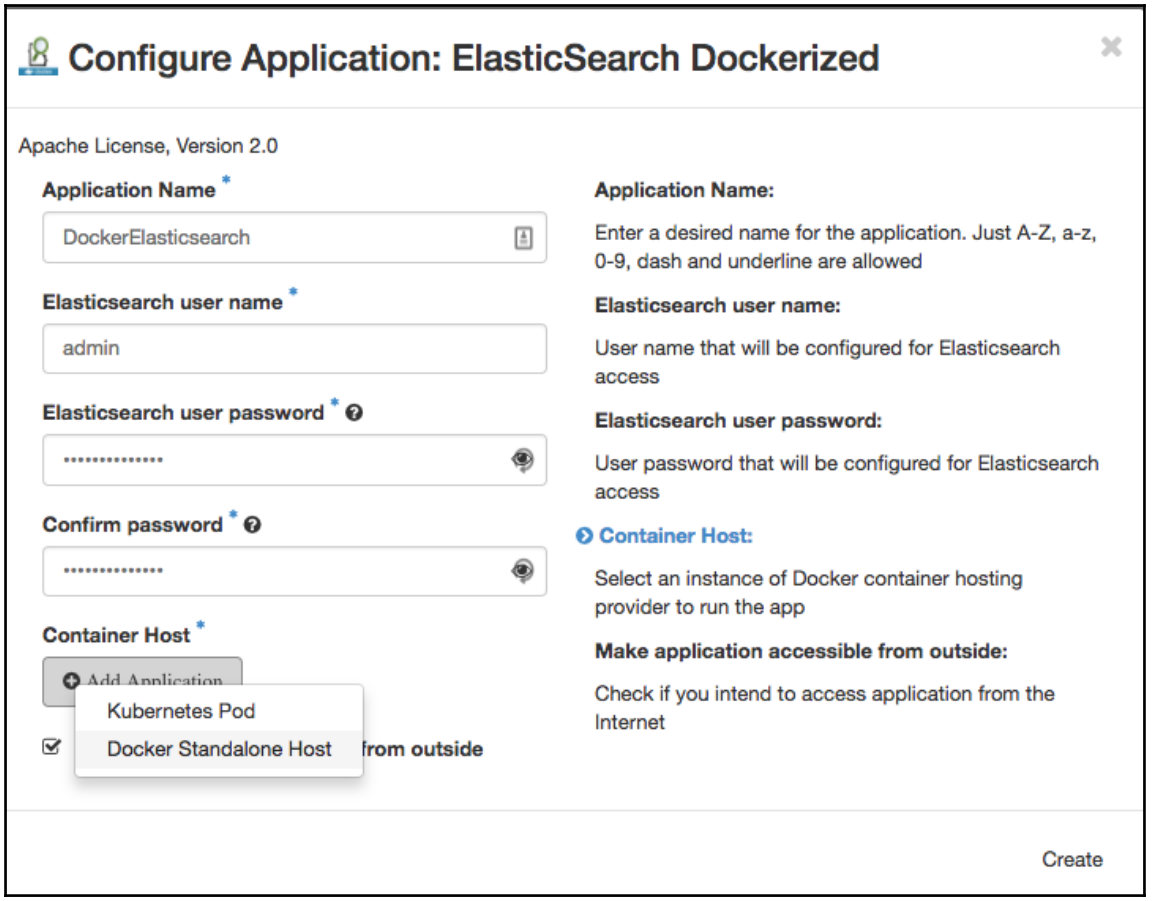

Import Package
Name *
ElasticSearch Dockerized
Tags
docker, Elasticsearch, Extending
Public
Active
Description
Elasticsearch is a search server based on Lucene. It provides a distributed, multitenant-capable full-text search engine with a RESTful web interface and schema-free JSON documents.
Description:
Name: Set up for identifying a package.
Tags: Used for identifying and filtering packages.
Public: Defines whether or not a package can be used by other tenants. (Applies to package dependencies)
Active: Allows to hide a package from the catalog. (Applies to package dependencies)
Description: Allows adding additional information about a package.
Cancel
Next

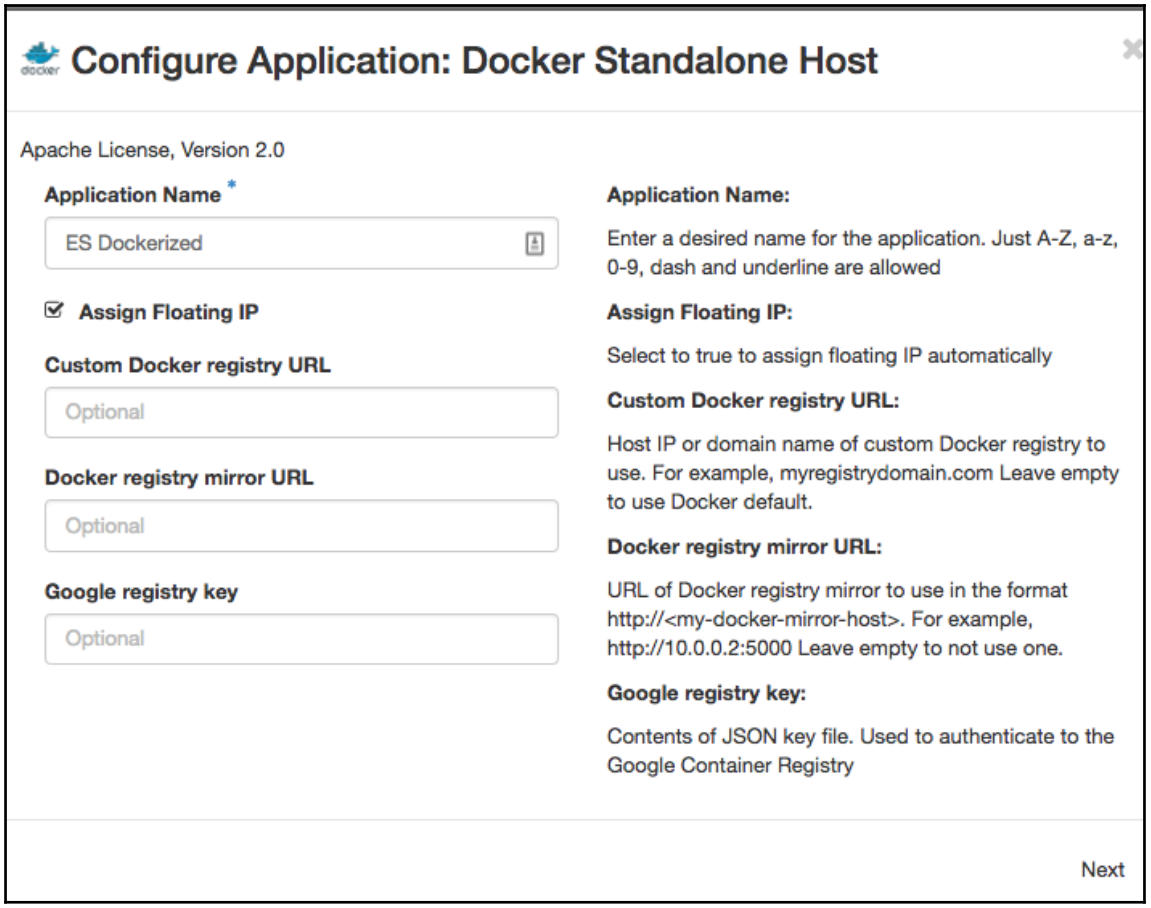


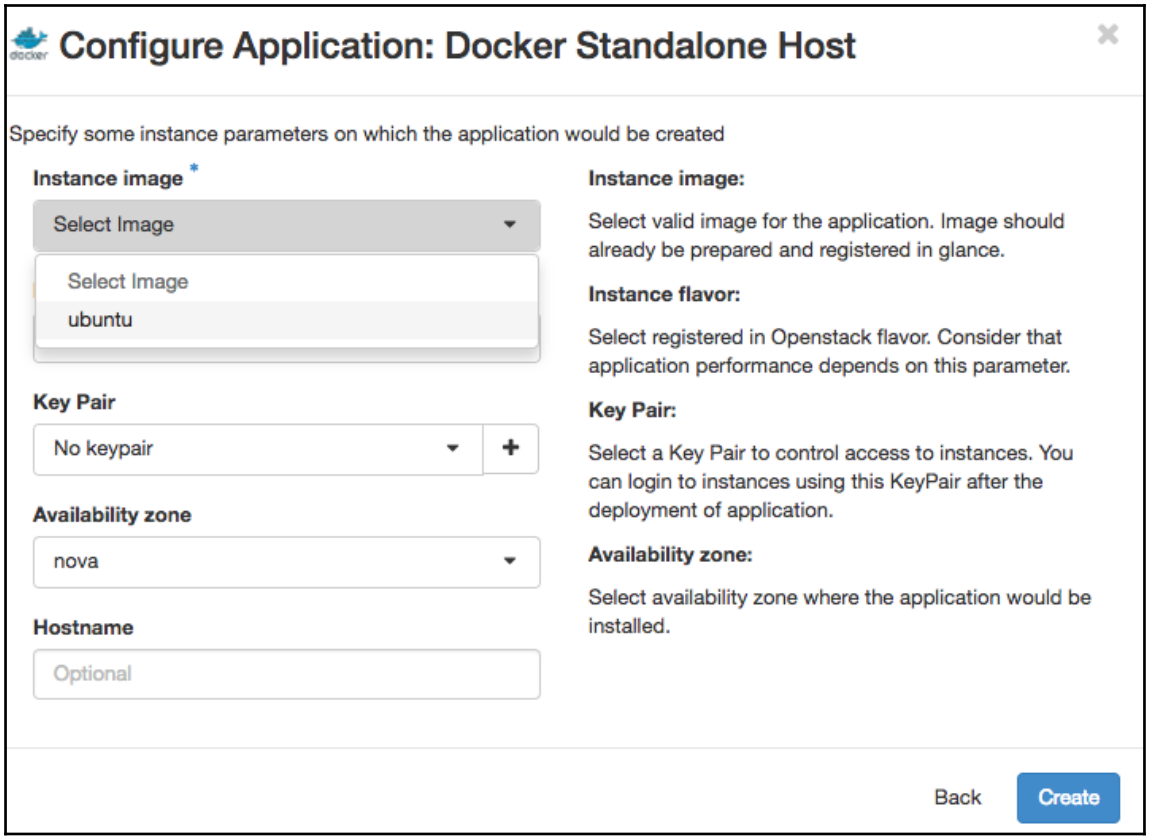

```
2018-02-16 18:15:17.030 | INFO diskimage_builder.block_device.level0.localloop [
2018-02-16 18:15:17.079 | INFO diskimage_builder.block_device.level0.localloop [
2018-02-16 18:15:20.145 | INFO diskimage_builder.block_device.utils [-] Calling
2018-02-16 18:15:20.308 | INFO diskimage_builder.block_device.blockdevice [-] Re
2018-02-16 18:15:20.637 | Converting image using qemu-img convert
2018-02-16 18:17:06.894 | Image file ubuntu14.04-x64-docker.qcow2 created...
```

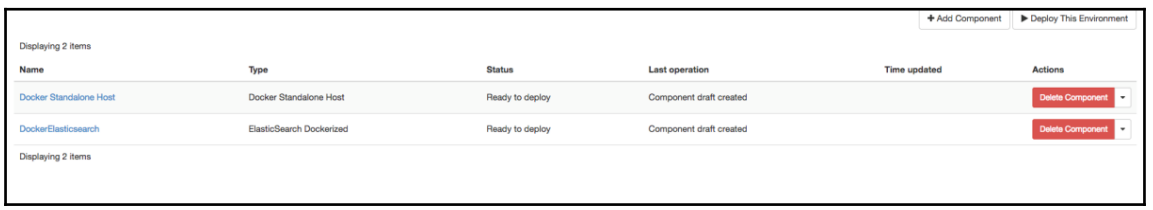
```
+------------------+------------------------------------------------------------------+
| Field            | Value                                                            |
+------------------+------------------------------------------------------------------+
| checksum         | b9556a392c81b1b031dce45c3eb7c31c                                 |
| container_format | bare                                                             |
| created_at       | 2018-02-16T18:20:21Z                                             |
| disk_format      | qcow2                                                            |
| file             | /v2/images/a7b61083-fe98-4e81-863b-849254f58f2e/file             |
| id               | a7b61083-fe98-4e81-863b-849254f58f2e                             |
| min_disk         | 0                                                                |
| min_ram          | 0                                                                |
| name             | ubuntu-app                                                       |
| owner            | bb2e456704724548a08371a83f0d7479                                 |
| properties       | murano_image_info='{"title": "Murano Ubuntu", "type": "linux"}'  |
| protected        | False                                                            |
| schema           | /v2/schemas/image                                                |
| size             | 648871936                                                        |
| status           | active                                                           |
| tags             |                                                                  |
| updated_at       | 2018-02-16T18:20:25Z                                             |
| virtual_size     | None                                                             |
| visibility       | shared                                                           |
+------------------+------------------------------------------------------------------+
```

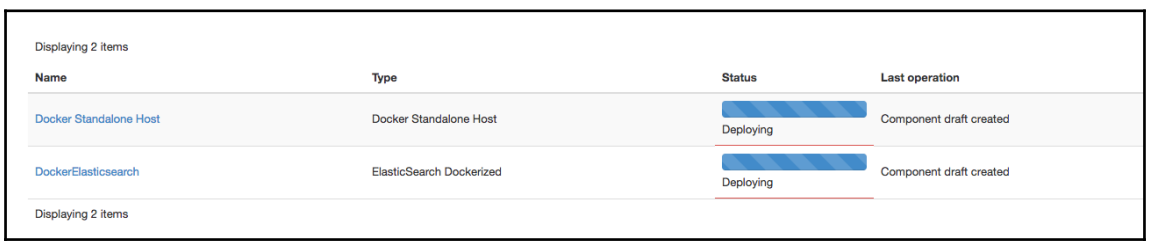

Add Murano Metadata
Image *
ubuntu-app
Title *
Ubuntu 14
Type *
Custom type
Custom Type
Dockerized
Description:
Mark an image with Murano specific metadata to be added to the selected image.
Image: Select an image registered in Glance Image Services.
Image Title: Create a title for an image.
Image Type: Select an image type supported by Murano. Choose 'Custom type' to enter type manually.
Custom Type: Enter an image type supported by Murano.
Cancel
Mark Image


Configure Application: ElasticSearch Dockerized
Apache License, Version 2.0
Application Name *
DockerElasticsearch
Elasticsearch user name *
admin
Elasticsearch user password *
Confirm password *
Container Host *
Add Application
Kubernetes Pod
Docker Standalone Host
from outside
Application Name:
Enter a desired name for the application. Just A-Z, a-z, 0-9, dash and underline are allowed
Elasticsearch user name:
User name that will be configured for Elasticsearch access
Elasticsearch user password:
User password that will be configured for Elasticsearch access
Container Host:
Select an instance of Docker container hosting provider to run the app
Make application accessible from outside:
Check if you intend to access application from the Internet
Create


Configure Application: Docker Standalone Host
Apache License, Version 2.0
Application Name *
ES Dockerized
Assign Floating IP
Custom Docker registry URL
Optional
Docker registry mirror URL
Optional
Google registry key
Optional
Application Name:
Enter a desired name for the application. Just A-Z, a-z, 0-9, dash and underline are allowed
Assign Floating IP:
Select to true to assign floating IP automatically
Custom Docker registry URL:
Host IP or domain name of custom Docker registry to use. For example, myregistrydomain.com Leave empty to use Docker default.
Docker registry mirror URL:
URL of Docker registry mirror to use in the format http://<my-docker-mirror-host>. For example, http://10.0.0.2:5000 Leave empty to not use one.
Google registry key:
Contents of JSON key file. Used to authenticate to the Google Container Registry
Next


Configure Application: Docker Standalone Host
Specify some instance parameters on which the application would be created
Instance image *
Select Image
Select Image
ubuntu
Key Pair
No keypair
Availability zone
nova
Hostname
Optional
Instance image:
Select valid image for the application. Image should already be prepared and registered in glance.
Instance flavor:
Select registered in Openstack flavor. Consider that application performance depends on this parameter.
Key Pair:
Select a Key Pair to control access to instances. You can login to instances using this KeyPair after the deployment of application.
Availability zone:
Select availability zone where the application would be installed.
Back
Create


+ Add Component
▶ Deploy This Environment
Displaying 2 items
Name
Type
Status
Last operation
Time updated
Actions
Docker Standalone Host
Docker Standalone Host
Ready to deploy
Component draft created
Delete Component
DockerElasticsearch
ElasticSearch Dockerized
Ready to deploy
Component draft created
Delete Component
Displaying 2 items


Displaying 2 items
Name
Type
Status
Last operation
Docker Standalone Host
Docker Standalone Host
Deploying
Component draft created
DockerElasticsearch
ElasticSearch Dockerized
Deploying
Component draft created
Displaying 2 items

Name: pyiisjdqcp8to1

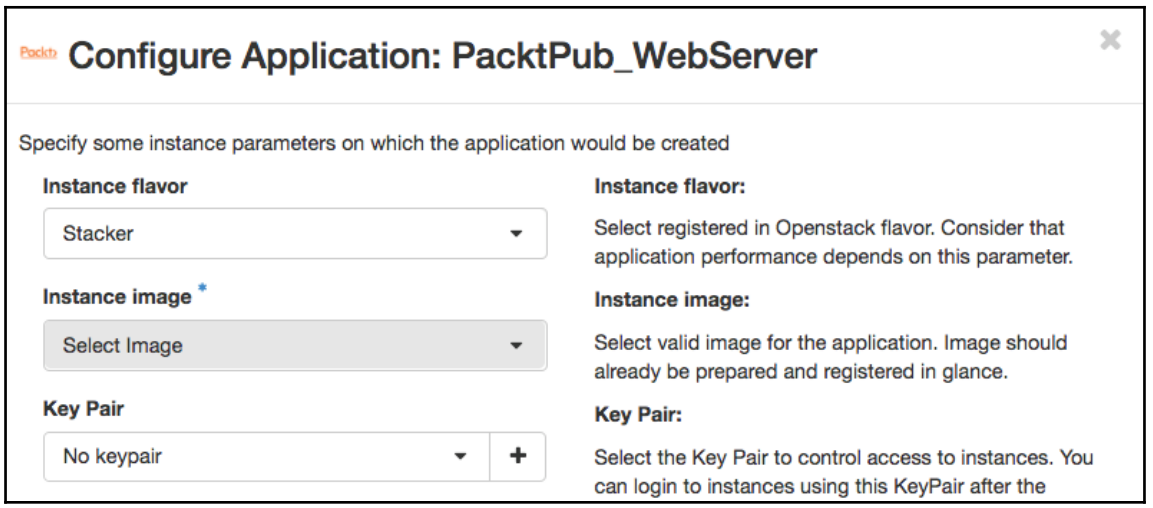
Availabilityzone: nova
Openstackid: None
Securitygroupname: None
Image: a7b61083-fe98-4e81-863b-849254f58f2e
Joinednetworks:
Id: de43ef37-a841-4a53-985b-1cd075d34e80
Blockdevices:
Checkapplicability: True
Floatingipaddress: None
Instanceaffinitygroup: None
Securitygroups:
Ipaddresses:
Flavor: m1.large
Regionname: None
Type:
...resources.LinuxMuranoInstance/0.0.0@io.murano
Assignfloatingip: True
Sharedips:
Keyname:

Chapter 8: Extending the Applications Catalog Service

```
Application.zip
       |
       |------------- manifest.yaml
       |------------- logo.png
       |------------- Classes\
       |            |--------- application.yaml
       |------------- Resources\
       |            |--------- scripts
                    |            |------- script.sh
                                 |------- ....
                    |--------- application_plan.template
       |-------------- UI\
                      |--------- UserInterface.yaml
```

```
Importing package com.example.apache.packtpub.WebServer
+--------------------------------+--------------------+-------------------------------------+-------------------------------------+--------+-----------+-------------+---------+
| ID                             | Name               | FQN                                 | Author                              | Active | Is Public | Type        | Version |
+--------------------------------+--------------------+-------------------------------------+-------------------------------------+--------+-----------+-------------+---------+
| b4ed1374292a45f0b3c7eb461df8dfd0 | PacktPub_WebServer | com.example.apache.packtpub.WebServer | PacktPub Cloud Application Publisher | True   |           | Application |         |
+--------------------------------+--------------------+-------------------------------------+-------------------------------------+--------+-----------+-------------+---------+
```

Configure Application: PacktPub_WebServer
Apache License, Version 2.0
Enable PHP
Assign Floating IP
Enable PHP:
Add php support to the Apache WebServer
Assign Floating IP:
Select to true to assign floating IP automatically
Next


Configure Application: PacktPub_WebServer
Specify some instance parameters on which the application would be created
Instance flavor
Stacker
Instance image *
Select Image
Key Pair
No keypair
Instance flavor:
Select registered in Openstack flavor. Consider that application performance depends on this parameter.
Instance image:
Select valid image for the application. Image should already be prepared and registered in glance.
Key Pair:
Select the Key Pair to control access to instances. You can login to instances using this KeyPair after the

Configure Application: PacktPub_WebServer
Application Name *
AwEsOmE-WebSite
Application Name:
Enter a desired name for the application. Just A-Z, a-z, 0-9, dash and underline are allowed
Continue application adding:

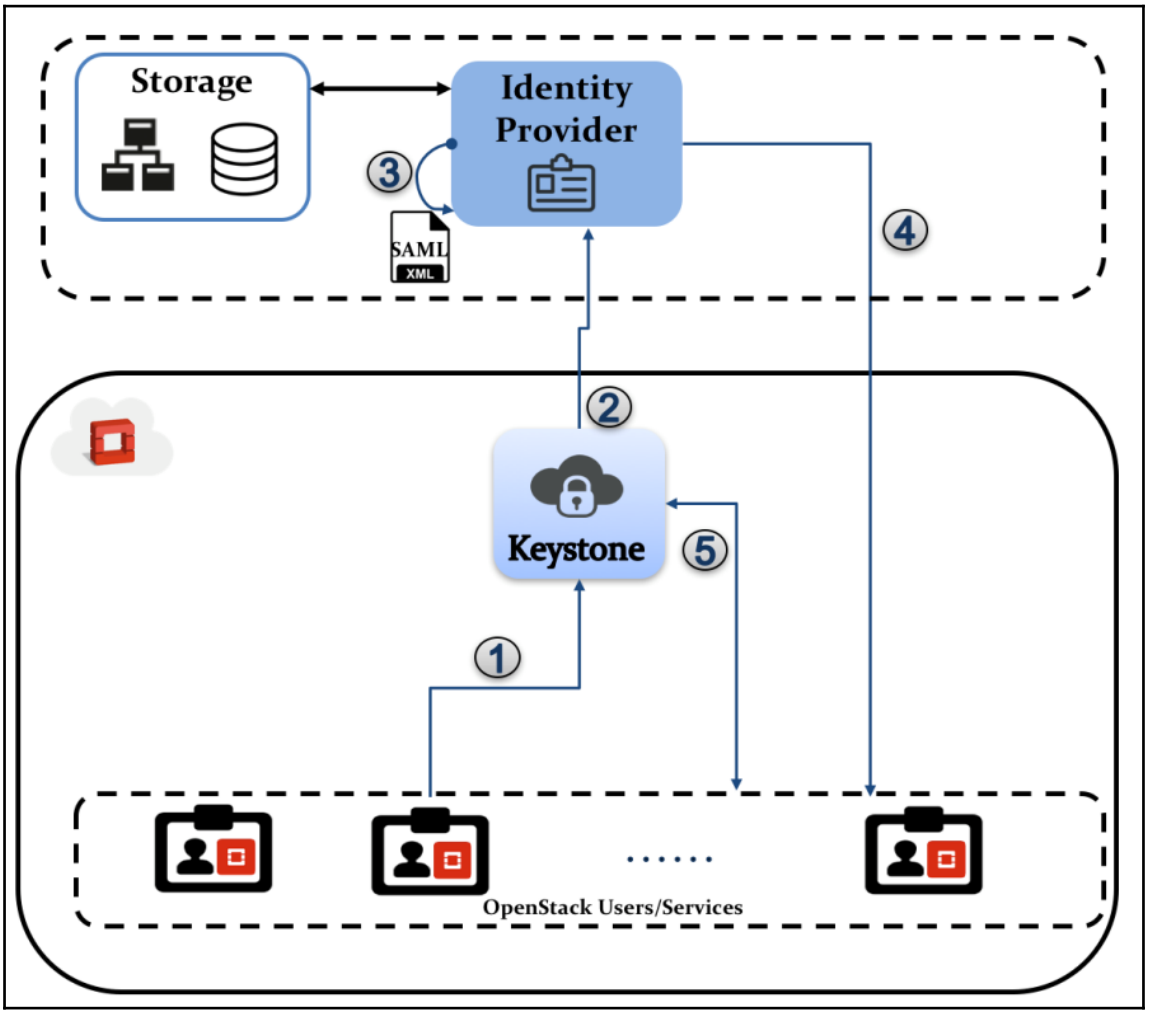
Name	Type	Status	Last operation
AwEsOmE-WebSite	PacktPub_WebServer	Ready to deploy	Component draft created

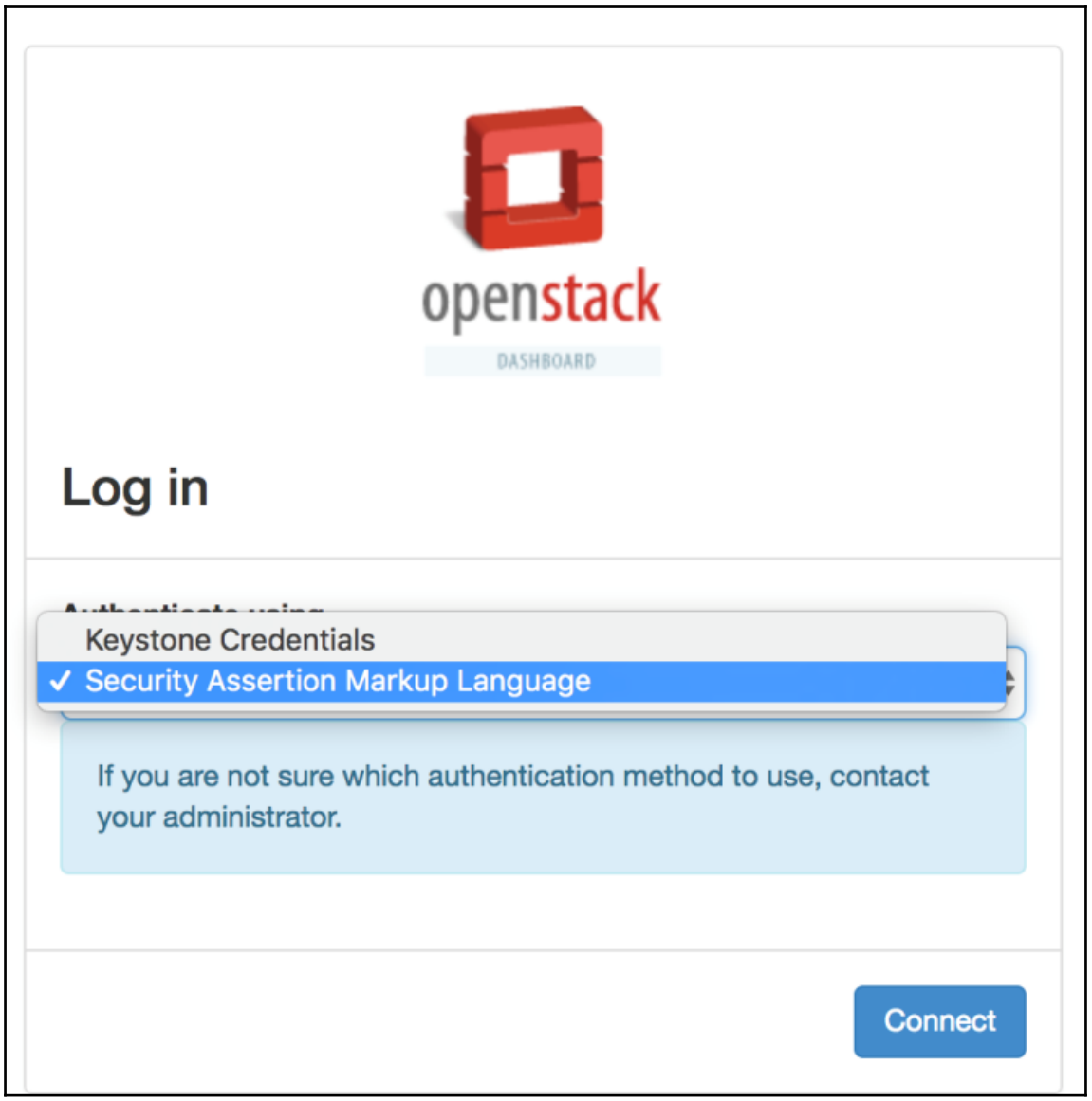
Displaying 1 item

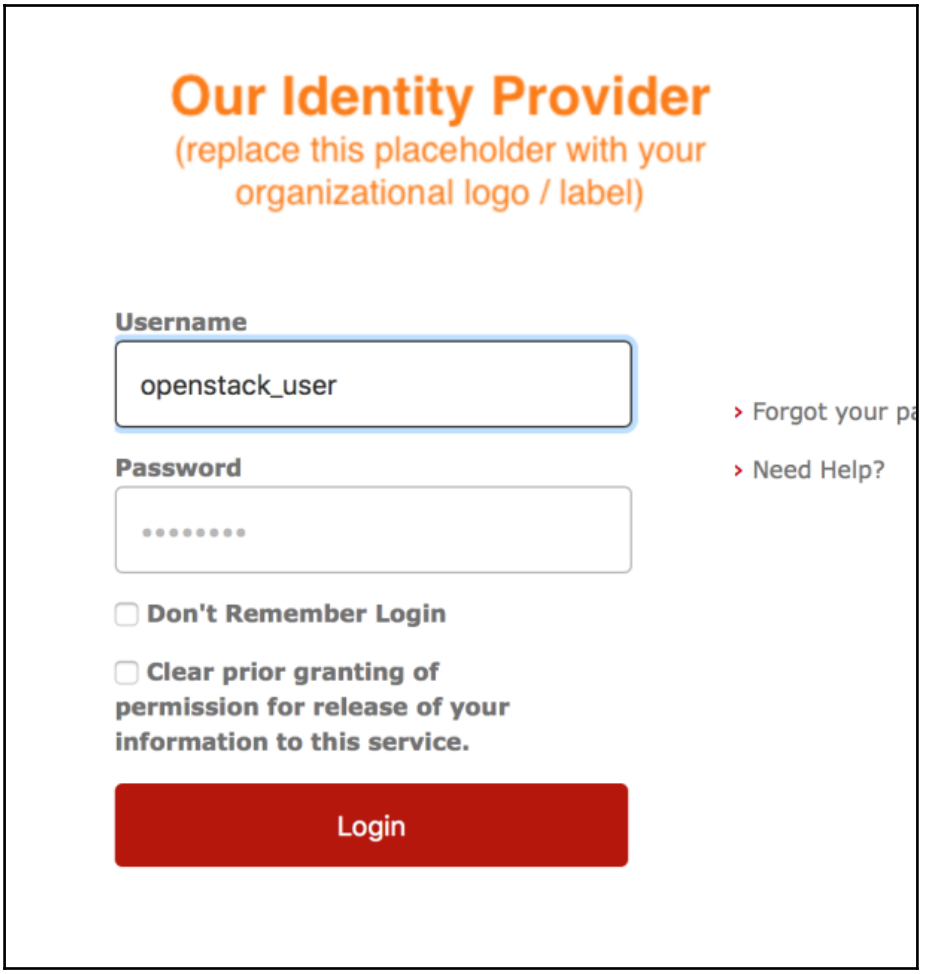
Name	Type	Status	Last operation
AwEsOmE-WebSite	PacktPub_WebServer	Deploying	Component draft created

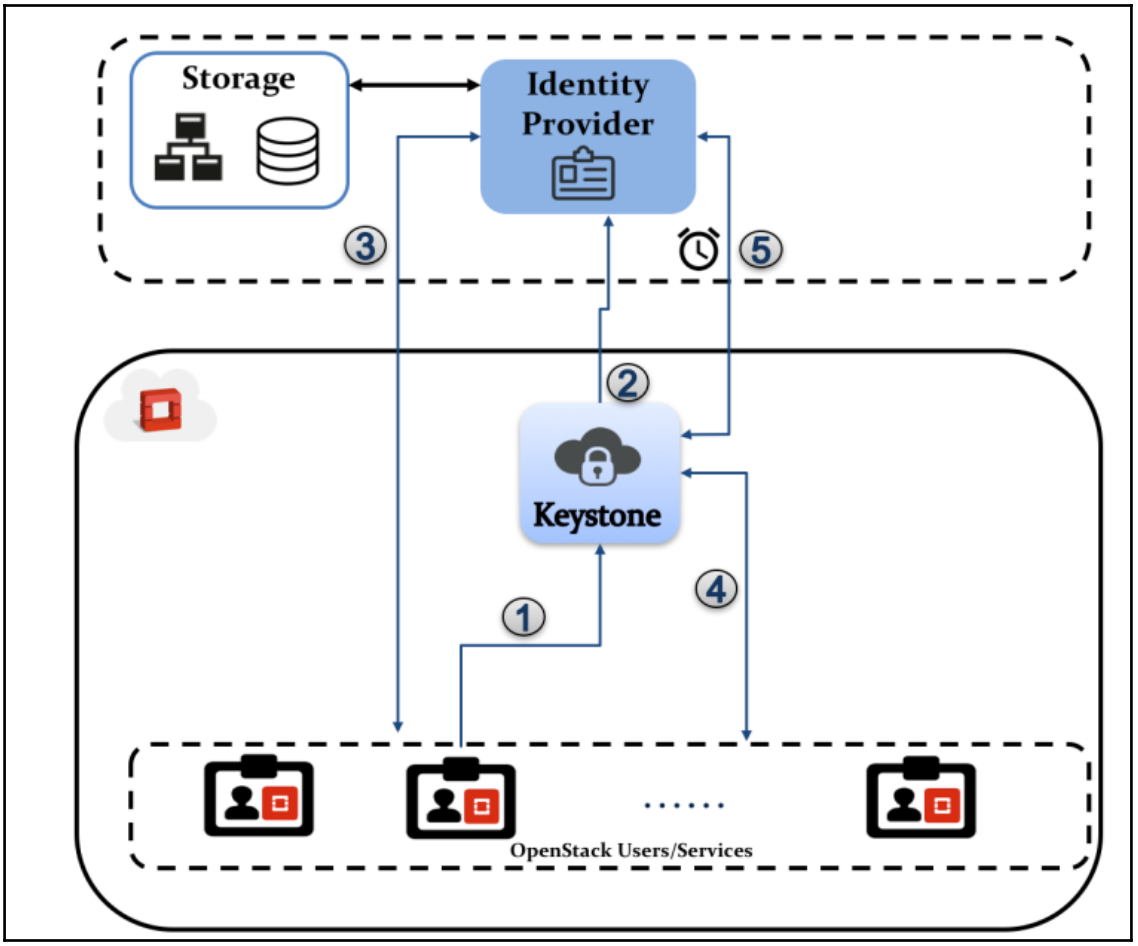
Displaying 1 item

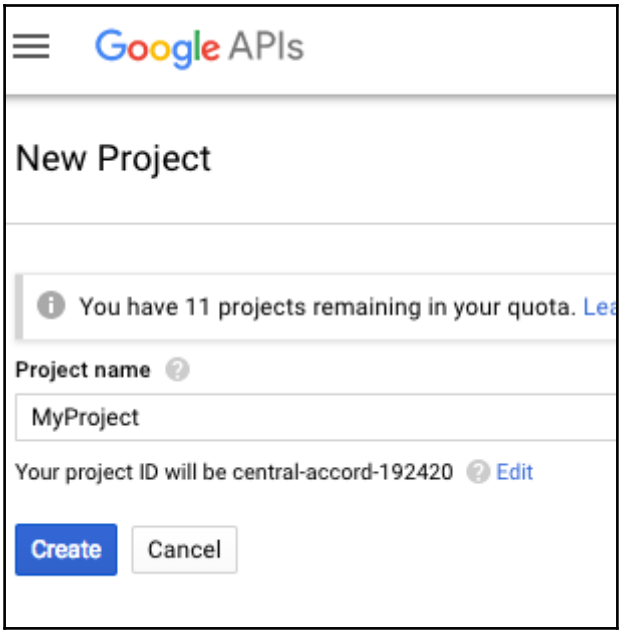
Chapter 9: Consolidating the OpenStack Authentication

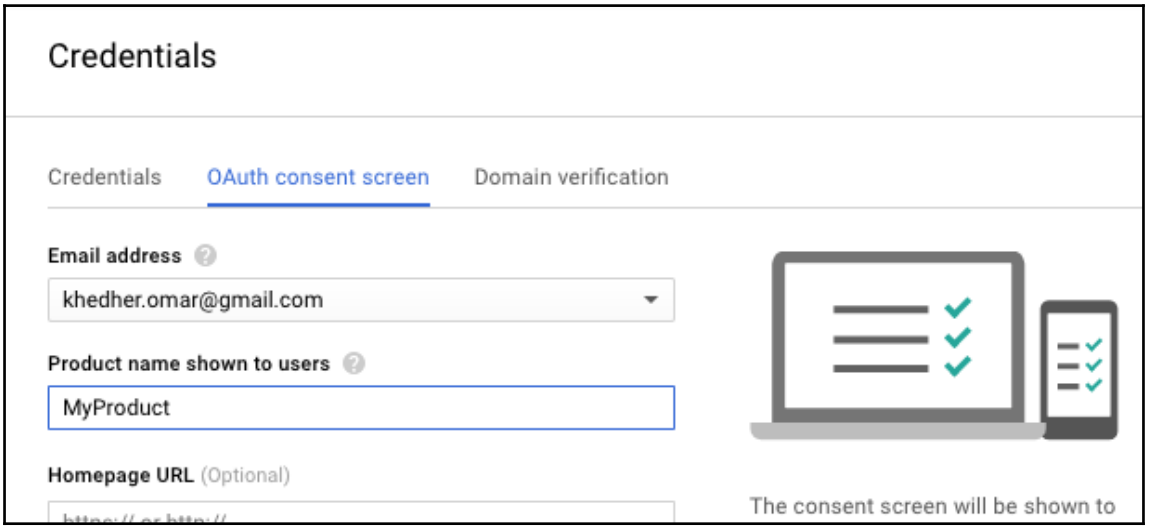


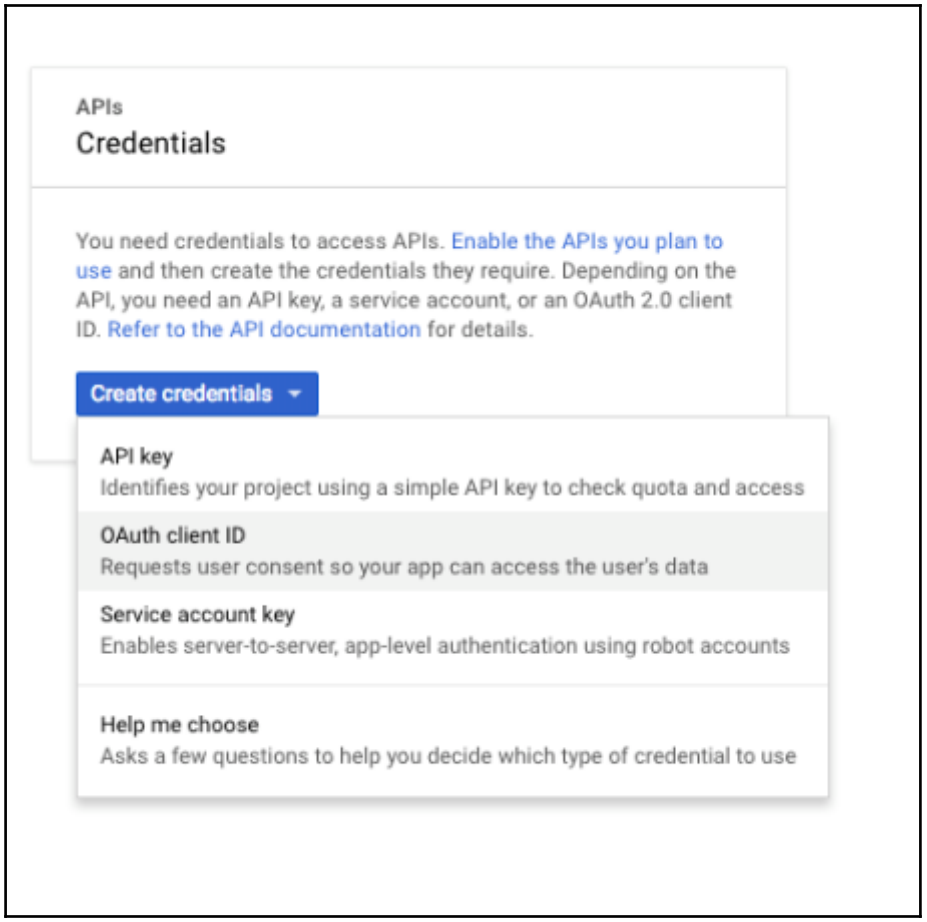

openstack
DASHBOARD
Log in
Keystone Credentials
Security Assertion Markup Language
If you are not sure which authentication method to use, contact your administrator.
Connect

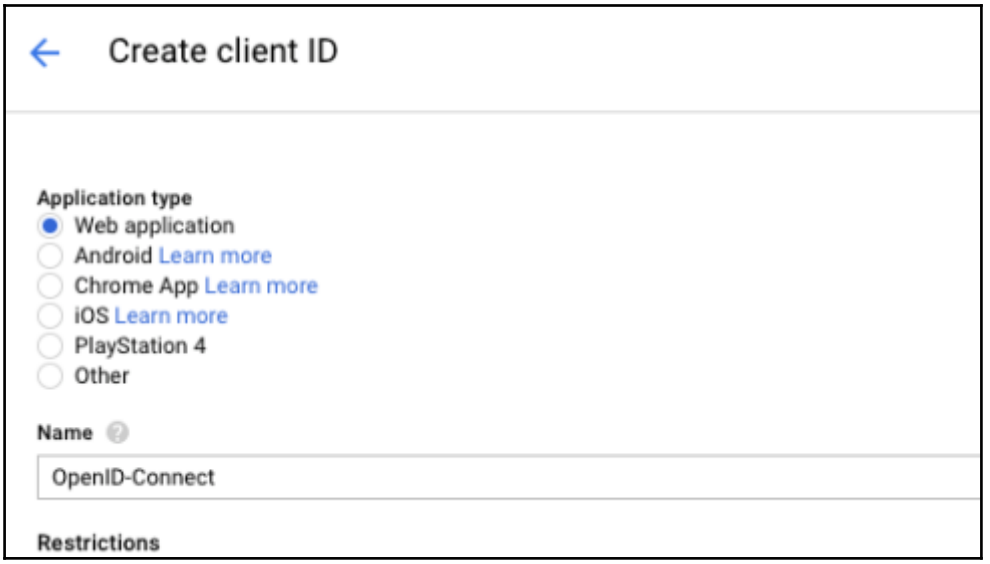

Our Identity Provider
(replace this placeholder with your organizational logo / label)
Username
openstack_user
Password
Don't Remember Login
Clear prior granting of permission for release of your information to this service.
Login
› Forgot your pa
› Need Help?

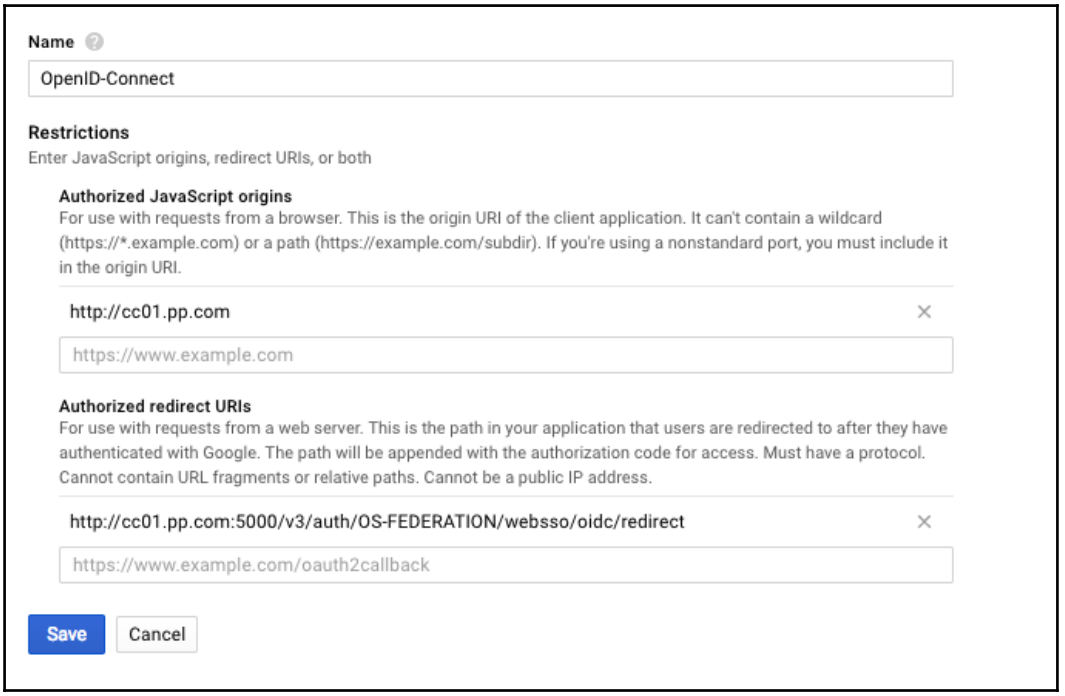

Storage
Identity Provider
3
5
2
Keystone
1
4
OpenStack Users/Services


Google APIs
New Project
You have 11 projects remaining in your quota. Lea
Project name
MyProject
Your project ID will be central-accord-192420 Edit
Create
Cancel

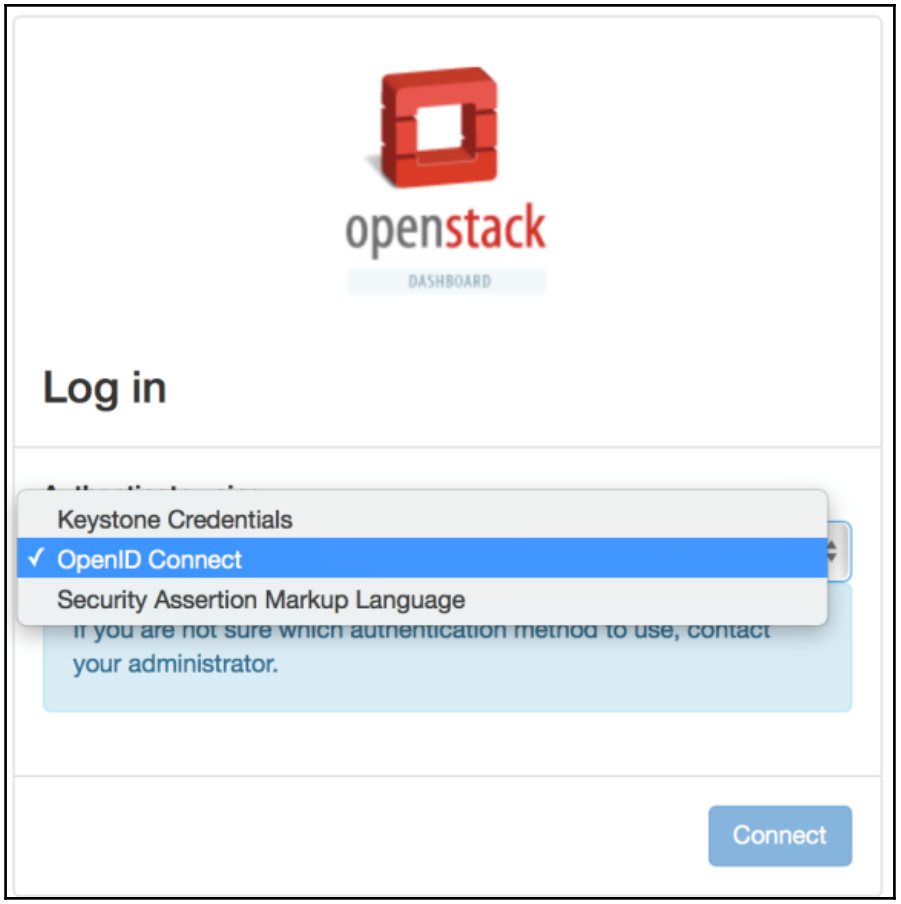

Credentials
Credentials
OAuth consent screen
Domain verification
Email address
khedher.omar@gmail.com
Product name shown to users
MyProduct
Homepage URL (Optional)
The consent screen will be shown to

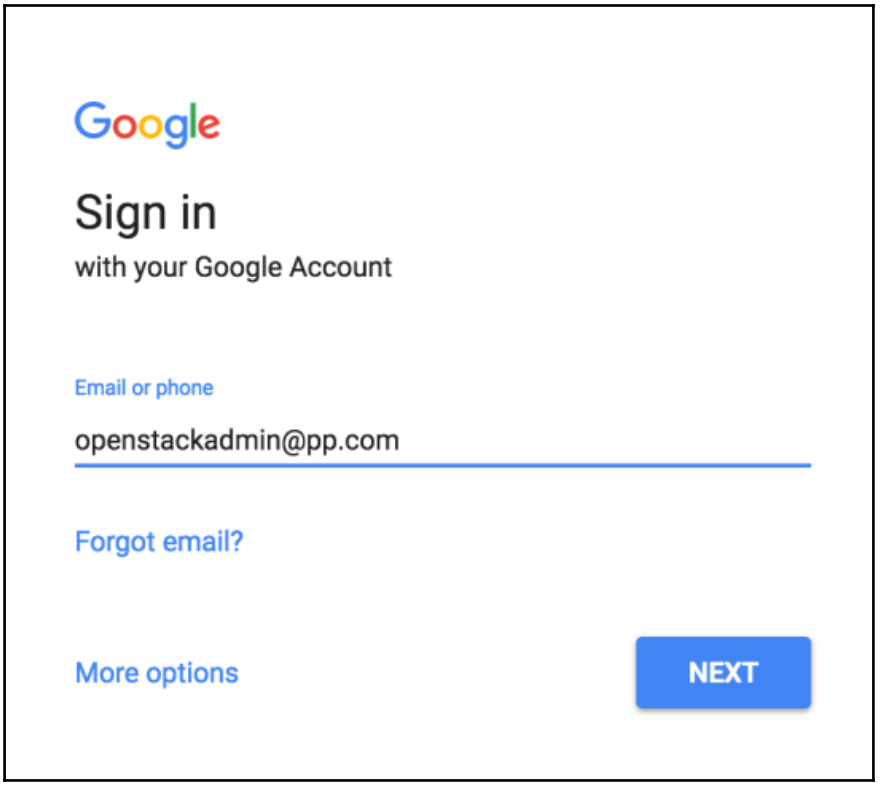

APIs
Credentials
You need credentials to access APIs. Enable the APIs you plan to use and then create the credentials they require. Depending on the API, you need an API key, a service account, or an OAuth 2.0 client ID. Refer to the API documentation for details.
Create credentials
API key
Identifies your project using a simple API key to check quota and access
OAuth client ID
Requests user consent so your app can access the user's data
Service account key
Enables server-to-server, app-level authentication using robot accounts
Help me choose
Asks a few questions to help you decide which type of credential to use


Create client ID
Application type
Web application
Android Learn more
Chrome App Learn more
iOS Learn more
PlayStation 4
Other
Name
OpenID-Connect
Restrictions

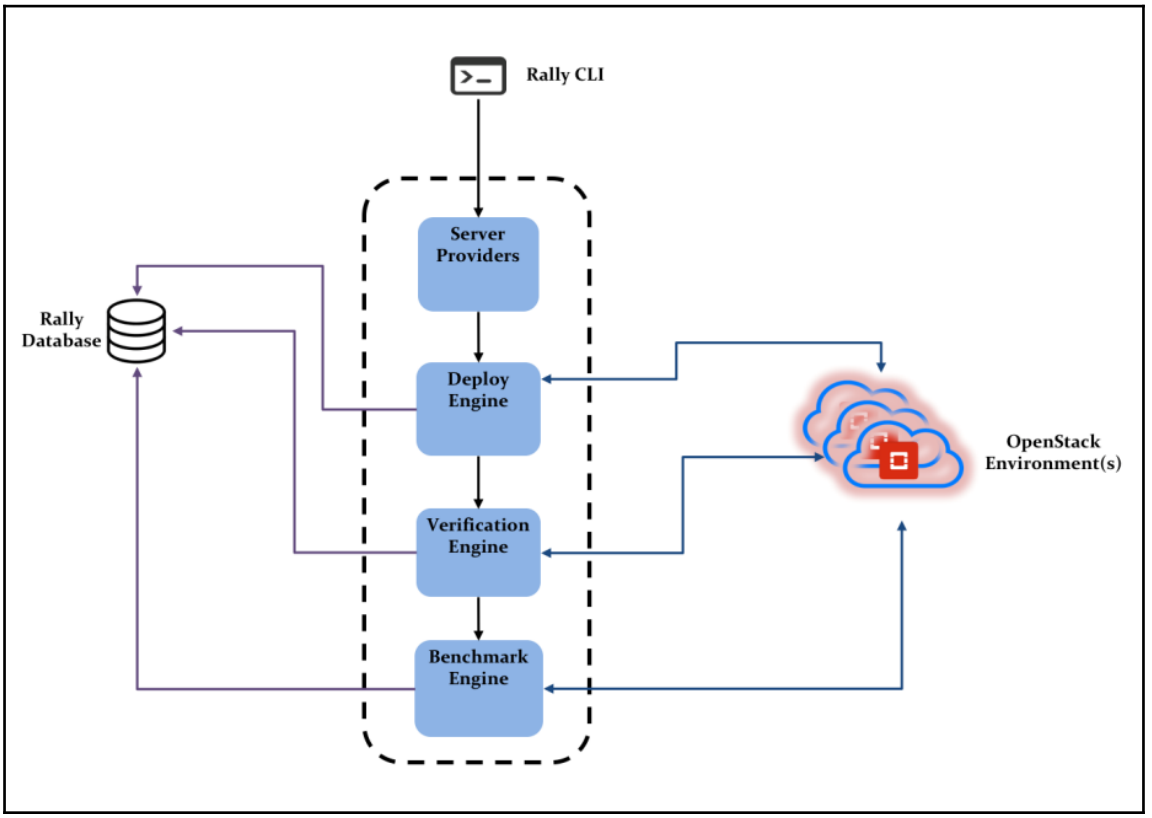

Name
OpenID-Connect
Restrictions
Enter JavaScript origins, redirect URIs, or both
Authorized JavaScript origins
For use with requests from a browser. This is the origin URI of the client application. It can't contain a wildcard (https://*.example.com) or a path (https://example.com/subdir). If you're using a nonstandard port, you must include it in the origin URI.
http://cc01.pp.com
https://www.example.com
Authorized redirect URIs
For use with requests from a web server. This is the path in your application that users are redirected to after they have authenticated with Google. The path will be appended with the authorization code for access. Must have a protocol. Cannot contain URL fragments or relative paths. Cannot be a public IP address.
http://cc01.pp.com:5000/v3/auth/OS-FEDERATION/websso/oidc/redirect
https://www.example.com/oauth2callback
Save
Cancel

Client ID	1016489529489-rc99n5rkc2cfepfdbjh9lvgqdp29g86g.apps.googleusercontent.com
Client secret	NFVoWl_XXdNap9Cypf0BhNMC
Creation date	Jan 17, 2018, 9:27:31 PM




Google
Sign in
with your Google Account
Email or phone
openstackadmin@pp.com
Forgot email?
More options
NEXT

Chapter 10: Boosting the Extended Cloud Universe




```
Step 6/6 : RUN rally-manage --config-file /etc/rally/rally.conf db recreate
 ---> Running in e61bff71ed64
Removing intermediate container e61bff71ed64
 ---> 9d82099bf324
Successfully built 9d82099bf324
Successfully tagged rally/latest:latest
```

```
CONTAINER ID        IMAGE                COMMAND             CREATED             STATUS              PORTS               NAMES
849957108b27        rally/latest:latest  "/bin/bash"         11 seconds ago      Up 10 seconds                           objective_jackson
```

```
2018-01-30 22:05:35.172 28 INFO rally.deployment.engines.existing [-] Save deployment 'mycloud' (uuic
+--------------------------------------+---------------------+---------+-----------------+--------+
| uuid                                 | created_at          | name    | status          | active |
+--------------------------------------+---------------------+---------+-----------------+--------+
| e63b2334-51f3-4600-8c86-4db25179e24e | 2018-01-30T22:05:35 | mycloud | deploy->finished |        |
+--------------------------------------+---------------------+---------+-----------------+--------+
Using deployment: e63b2334-51f3-4600-8c86-4db25179e24e
```

```
Available services:
+-------------+-----------------+-----------+
| Service     | Service Type    | Status    |
+-------------+-----------------+-----------+
| __unknown__ | alarming        | Available |
| __unknown__ | placement       | Available |
| __unknown__ | volumev2        | Available |
| __unknown__ | volumev3        | Available |
| ceilometer  | metering        | Available |
| cinder      | volume          | Available |
| cloud       | cloudformation  | Available |
| glance      | image           | Available |
| gnocchi     | metric          | Available |
| heat        | orchestration   | Available |
| keystone    | identity        | Available |
| magnum      | container-infra | Available |
| neutron     | network         | Available |
| nova        | compute         | Available |
| sahara      | data-processing | Available |
| swift       | object-store    | Available |
+-------------+-----------------+-----------+
```

```
--------------------------------------------------------------------------------
Preparing input task
--------------------------------------------------------------------------------

Task is:
{
  "MagnumClusters.create_and_list_clusters": [
    {
      "runner": {
        "type": "constant",
        "concurrency": 1,
```

```
2018-02-05 22:07:06.864 1630 INFO rally.task.context [-] Task 978ce786-dca7-426a-93c9-aacc28a96acb | Context cluster_templates@openstack setup()  finished in 5.48 sec
2018-02-05 22:07:06.865 1630 INFO rally.task.context [-] Task 978ce786-dca7-426a-93c9-aacc28a96acb | Context cleanup@openstack setup()  started
2018-02-05 22:07:06.865 1630 INFO rally.task.context [-] Task 978ce786-dca7-426a-93c9-aacc28a96acb | Context cleanup@openstack setup()  finished in 0.23 msec
2018-02-05 22:07:06.896 1763 INFO rally.task.runner [-] Task 978ce786-dca7-426a-93c9-aacc28a96acb | ITER: 1 START
```

```
2018-02-04 14:33:33.374 3982 INFO rally.common.plugin.discover [-] Loading plugins from directories /usr/share/openstack-rally/samples/plugins/*
2018-02-04 14:33:33.440 3982 INFO rally.common.plugin.discover [-]       Loaded module with plugins: /usr/share/openstack-rally/samples/plugins/list_flavors.py
+---------------------+-------------------------------------------------------------+-----------+-------------------------------------------------------------------+
| Plugin base         | Name                                                        | Platform  | Title                                                                |
+---------------------+-------------------------------------------------------------+-----------+-------------------------------------------------------------------+
| Chart               | Lines                                                       | default   | Display results as generic chart with lines.                         |
| Chart               | Pie                                                         | default   | Display results as pie, calculate average values for additive data.  |
| Chart               | StackedArea                                                 | default   | Display results as stacked area.                                     |
| Chart               | StatsTable                                                  | default   | Calculate statistics for additive data and display it as table.     |
| Chart               | Table                                                       | default   | Display complete output as table, can not be used for additive data. |
| Chart               | TextArea                                                    | default   | Arbitrary text                                                       |
| Context             | allow_ssh                                                   | openstack | Sets up security groups for all users to access VM via SSH.          |
| Context             | api_versions                                                | openstack | Context for specifying OpenStack clients versions and service types. |
```

```
--------------------------------------------------------------------------------
create cluster and then list all clusters.
--------------------------------------------------------------------------------

NAME
        MagnumClusters.create_and_list_clusters
PLATFORM
        openstack
MODULE
        rally.plugins.openstack.scenarios.magnum.clusters
PARAMETERS
+-----------------------+------------------------------------------------------+
| name                  | description                                          |
+-----------------------+------------------------------------------------------+
| node_count            | the cluster node count.                              |
|                       |                                                      |
| cluster_template_uuid | optional, if user want to use an existing            |
|                       | cluster_template                                     |
|                       |                                                      |
| kwargs                | optional additional arguments for cluster creation   |
+-----------------------+------------------------------------------------------+
```

```
2018-02-13 20:55:36.432 108 INFO rally.common.plugin.discover [-] Loading plugins from directories /usr/share/openstack-rally/samples/plugins/*
```

```
2018-02-13 21:36:53.494 144 INFO rally.common.plugin.discover [-]        Loaded module with plugins: /usr/share/openstack-rally/samples/plugins/create_delete_magnum.py
```

```
| Scenario | ScenarioNodeGroupTemplates.create_delete_node_group_templates | openstack | Create and delete Sahara node group templates.
| Scenario | ScenarioPlugin.create_and_delete_magnum_clusters              | openstack | create cluster and then delete.
| Scenario | ScenarioPlugin.list_clusters_kube                             | openstack | List kube clusters.
```

```
-------------------------------------------------------------------------------
create cluster and then delete.
-------------------------------------------------------------------------------

NAME
        ScenarioPlugin.create_and_delete_magnum_clusters
PLATFORM
        openstack
MODULE
        create_delete_magnum
PARAMETERS
+----------------------+-----------------------------------------------------+
| name                 | description                                         |
+----------------------+-----------------------------------------------------+
| node_count           | the cluster node count.                             |
|                      |                                                     |
| cluster_template_uuid | optional, if user want to use an existing          |
|                      | cluster_template                                    |
|                      |                                                     |
| force_delete         | force delete cluster if set to True                 |
|                      |                                                     |
| kwargs               | optional additional arguments for cluster creation  |
+----------------------+-----------------------------------------------------+
```

```
          "image_id": "fedora-latest",
          "network_driver": "flannel"
        },
        "users": {
          "users_per_tenant": 5,
          "tenants": 1
        }
      },
      "sla": {
        "failure_rate": {
          "max": 0
        }
      }
    }
  ]
}

Task syntax is correct :)
Running Rally version 0.10.0
--------------------------------------------------------------------------------
Task  758ffbbc-2770-4f71-b9cc-97b66cafacb0: started
--------------------------------------------------------------------------------

Running Task... This can take a while...
```

Response Times (sec)

Min (sec)	Median (sec)	90%ile (sec)	95%ile (sec)	Max (sec)	Avg (sec)	Success
3.866	10.256	19.705	19.71	19.714	10.806	0.0%
3.866	10.256	19.706	19.71	19.714	10.806	0.0%
2.866	9.256	18.706	18.71	18.714	9.806	0.0%
1.0	1.0	1.0	1.0	1.0	1.0	0.0%

```
ceErrorStatus: Resource <Server: s_rally_8d021c19_ajlMm2cB> has ERROR status.
 Fault: {u'message': u'No valid host was found. ', u'code': 500, u'created': u'2018-02-01T23:10:11Z'}
2018-02-01 23:10:12.614 318 INFO rally.task.runner [-] Task 22e6c6c3-c346-48e2-be25-5a86bf20a46f | ITER:
2018-02-01 23:10:14.139 319 INFO rally.task.runner [-] Task 22e6c6c3-c346-48e2-be25-5a86bf20a46f | ITER:
```