



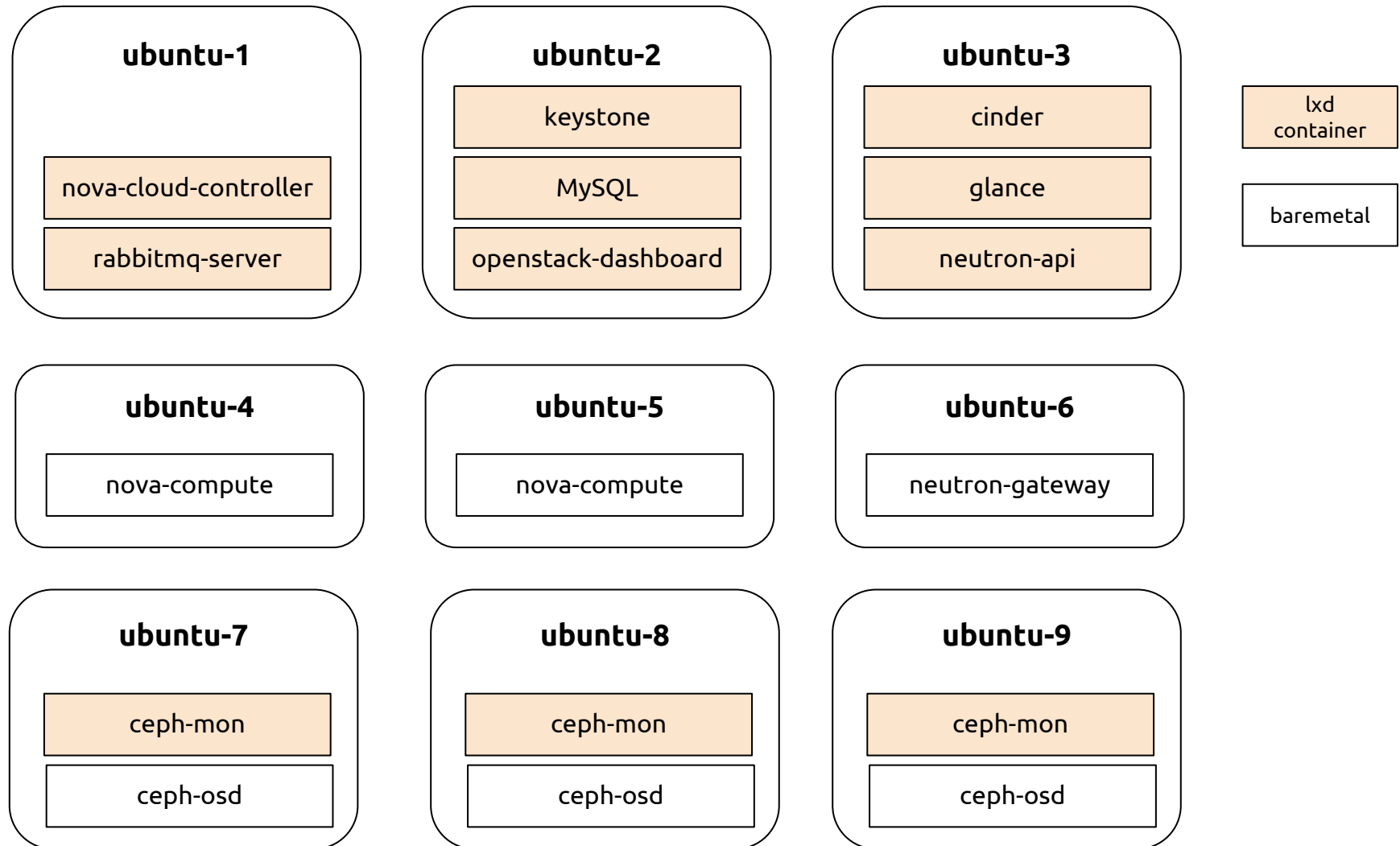
juju demo - OpenStack deployment

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- Juju demo
 - OpenStack
 - OpenStack H/A
- Juju & MAAS
- Juju charm & bundle
- Conjure-up



Juju demo - OpenStack



Juju demo - OpenStack



```
$juju deploy ./newton-neutron-bundle.yaml
```

Stateless vs Stateful

The way to achieve HA depends on stateless or stateful services

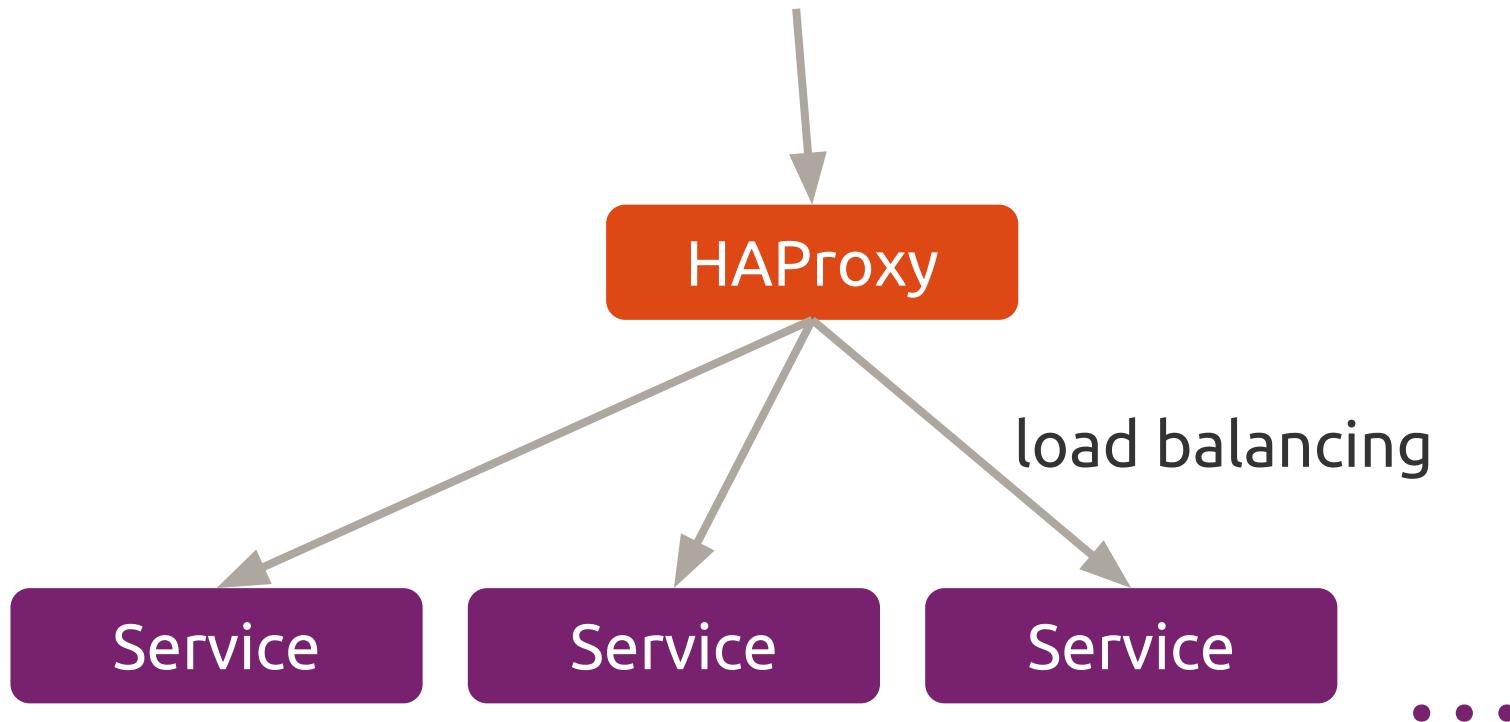
- Stateless
 - Services which do not hold any state, i.e. Horizontally scalable
 - e.g. API services (Keystone API, Nova API, etc.), Swift proxy, Ceph RADOS gateway
 - VIP + HAproxy model (Active/Active) can be applied
- Stateful
 - Services which hold states
 - e.g. Database, Messaging queue(RabbitMQ)
 - Native clustering mechanisms (Active/Active) can be applied

OpenStack deployment H/A



VIP (Virtual IP) + HAProxy model

For stateless services (e.g Keystone API, Nova API, etc.)

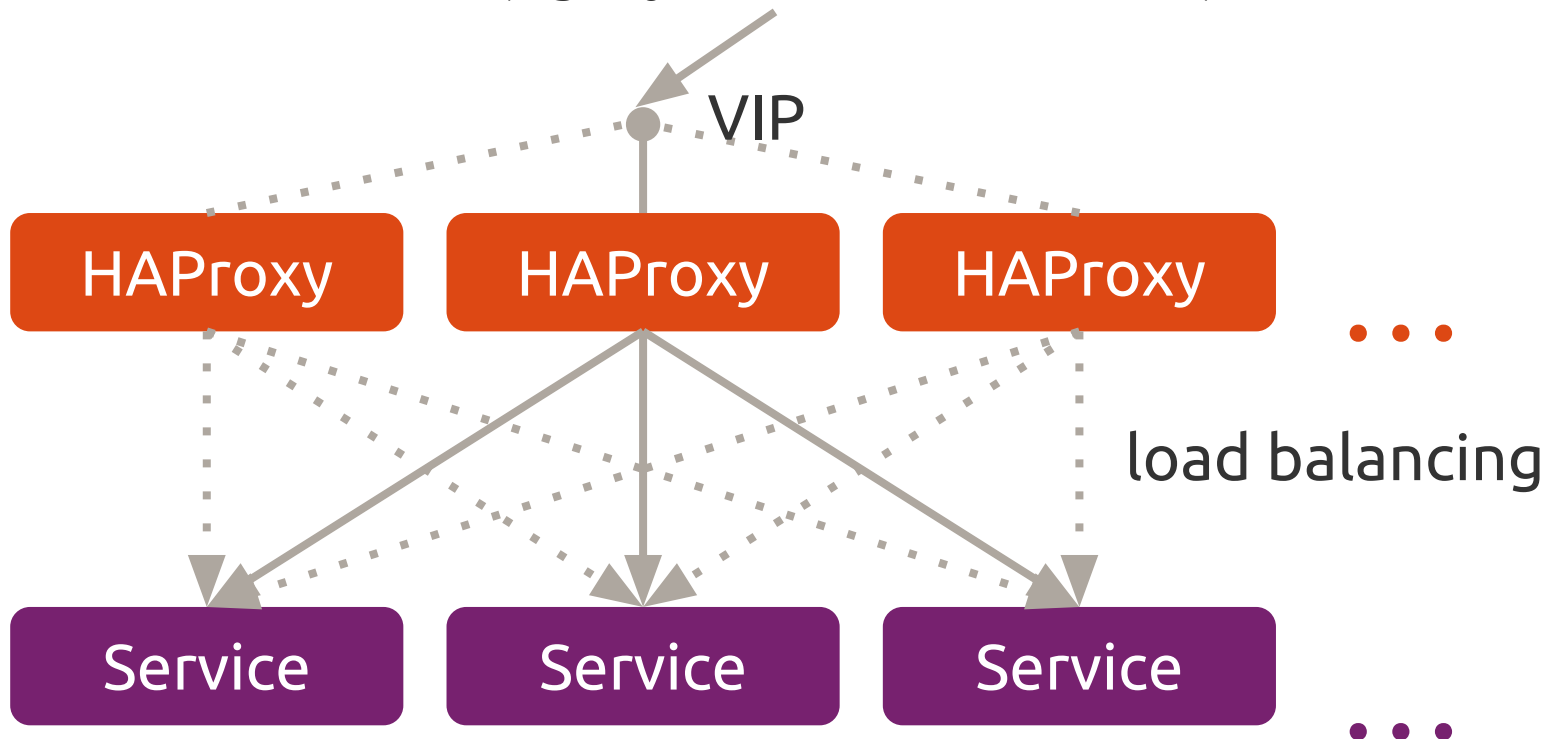


OpenStack deployment H/A



VIP (Virtual IP) + HAProxy model

For stateless services (e.g Keystone API, Nova API, etc.)



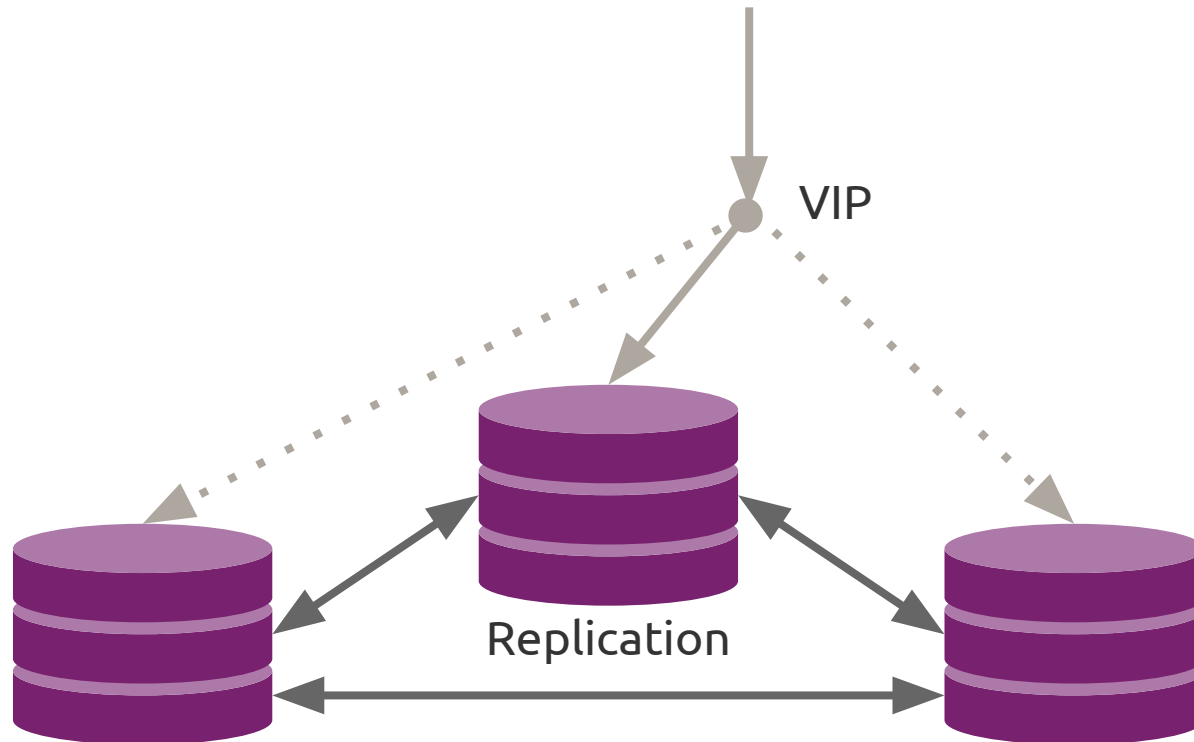
To remove the SPOF, one of the active units will own the VIP of the service.

OpenStack deployment H/A



Percona XtraDB Cluster

MySQL highly available Active/Active cluster



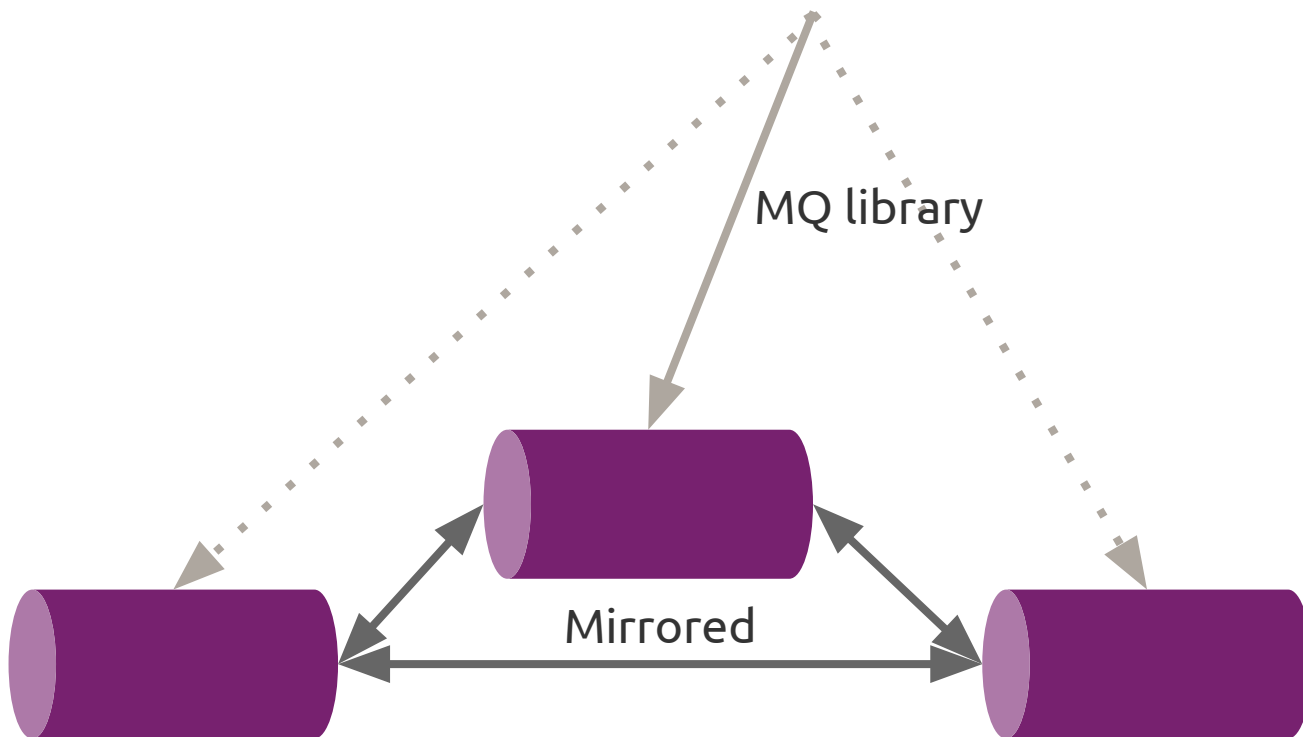
One of the active units will own the VIP. Database will be replicated across the cluster.

OpenStack deployment H/A



RabbitMQ

Mirrored queue



Messaging queues will be mirrored across the cluster.

OpenStack deployment H/A



For instance, keystone

```
$juju add-unit keystone --to lxd:0
```

```
$juju add-unit keystone --to lxd:2
```

```
$juju config keystone vip=172.30.1.177
```

```
$juju deploy hacluster hacluster-keystone
```

```
$juju add-relation hacluster-keystone keystone
```

OpenStack deployment H/A



Percona XtraDB

```
$juju add-unit percona-cluster --to lxd:1
```

```
$juju add-unit percona-cluster --to lxd:2
```

```
$juju config percona-cluster vip=172.30.1.178
```

```
$juju config percona-cluster min-cluster-size=3
```

```
$juju deploy hacluster hacluster-percona
```

```
$juju add-relation hacluster-keystone keystone
```

RabbitMQ

```
$juju add-unit rabbitmq-server --to lxd:1
```

```
$juju add-unit rabbitmq-server --to lxd:2
```

```
$juju config rabbitmq-server min-cluster-size=3
```

```
$juju config rabbitmq-server cluster-partition-handling=pause_minority
```

Juju & MAAS



MAAS (Metal as a Service)

MAAS

Nodes

Pods

Images

DNS

Zones

Subnets

Settings

maas2 MAAS

admin

Logout

Nodes

Add hardware

13 Machines0 Devices1 Controller

Filter by

Status

Deployed (13)

Owner

Architectures

OS/Release

Tags

Storage Tags

Subnets

Fabrics

Spaces

Zones

Search nodes

☐ FQDN | MAC

Power

Status

Owner

Cores

RAM (GiB)

Disks

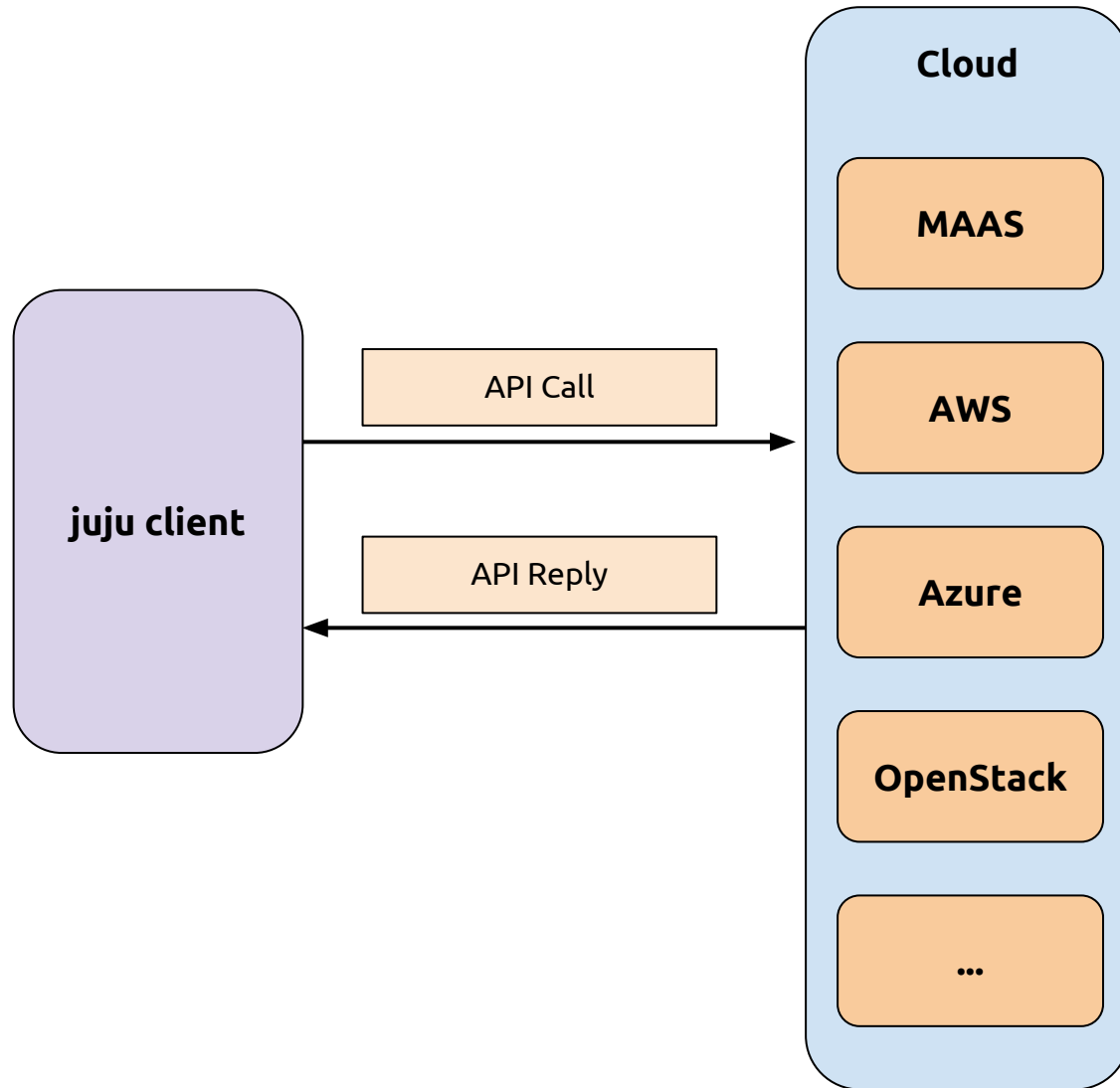
Storage (GB)

<input type="checkbox"/>	bootstrap.maas	On	Ubuntu 16.04 LTS	admin	2	1.0	1	10.7
<input type="checkbox"/>	u-VM-01.maas	On	Ubuntu 16.04 LTS	admin	2	2.0	2	32.2
<input type="checkbox"/>	u-VM-02.maas	On	Ubuntu 16.04 LTS	admin	2	2.0	2	32.2
<input type="checkbox"/>	u-VM-03.maas	On	Ubuntu 16.04 LTS	admin	2	2.0	2	32.2
<input type="checkbox"/>	ubuntu-2.maas	Unknown	Ubuntu 16.04 LTS	admin	4	8.0	1	500.1
<input type="checkbox"/>	ubuntu-3.maas	Unknown	Ubuntu 16.04 LTS	admin	4	8.0	1	500.1
<input type="checkbox"/>	ubuntu-4.maas	Unknown	Ubuntu 16.04 LTS	admin	4	8.0	1	500.1
<input type="checkbox"/>	ubuntu-5.maas	Unknown	Ubuntu 16.04 LTS	admin	4	8.0	1	500.1
<input type="checkbox"/>	ubuntu-6.maas	Unknown	Ubuntu 16.04 LTS	admin	4	8.0	1	500.1
<input type="checkbox"/>	ubuntu-7.maas	Unknown	Ubuntu 16.04 LTS	admin	4	8.0	1	500.1
<input type="checkbox"/>	ubuntu-8.maas	Unknown	Ubuntu 16.04 LTS	admin	4	8.0	1	500.1
<input type="checkbox"/>	ubuntu1.maas	Unknown	Ubuntu 16.04 LTS	admin	4	8.0	1	500.1
<input type="checkbox"/>	XenialTest.maas	Off	Ubuntu 16.04 LTS	admin	2	2.0	1	10.7

<https://docs.ubuntu.com/maas/2.3/en/>

CANONICAL

Juju & MAAS



Juju & MAAS



```
janghoon@juju2:~/apps$ juju clouds
```

Cloud	Regions	Default	Type	Description
aws	14	us-east-1	ec2	Amazon Web Services
aws-china	1	cn-north-1	ec2	Amazon China
aws-gov	1	us-gov-west-1	ec2	Amazon (USA Government)
azure	26	centralus	azure	Microsoft Azure
azure-china	2	chinaeast	azure	Microsoft Azure China
cloudsigma	5	hnl	cloudsigma	CloudSigma Cloud
google	8	us-east1	gce	Google Cloud Platform
joyent	6	eu-ams-1	joyent	Joyent Cloud
oracle	5	uscom-central-1	oracle	Oracle Cloud
rackspace	6	dfw	rackspace	Rackspace Cloud
localhost	1	localhost	lxd	LXD Container Hypervisor
maas-hw	0		maas	Metal As A Service

<https://jujucharms.com/docs/stable/clouds>



Charm

- Charms are sets of scripts that simplify the deployment and management tasks of a service. They are regularly reviewed and updated.

Bundle

- Bundles are collections of charms that link applications together, so you can deploy whole chunks of infrastructure in one go.

<https://jujucharms.com/store>

SPELL SELECTION

Choose from this list of recommended spells

bigdata

- Apache Hadoop + Apache Kafka Cluster
- Apache Hadoop + Apache Spark Cluster
- Apache Hadoop Cluster
- Apache Hadoop/Spark/Zeppelin Realtime Syslog Analytics
- Apache Spark Cluster

kubernetes

- ☒ Canonical Distribution of Kubernetes
- Kubernetes Core

openstack

- OpenStack with NovaKVM
- OpenStack with NovaLXD

other

- HA Ghost with MySQL
- Landscape

Kubernetes is an open-source platform for deploying, scaling, and operations of application containers across a cluster of hosts. Kubernetes is portable in that it works with public, private, and hybrid clouds. Extensible through a pluggable infrastructure. Self healing in that it will automatically restart and place containers on healthy nodes if a node ever goes away.

QUIT

<https://www.ubuntu.com/download/cloud/try-openstack>

- OpenStack on MAAS 1.9+ with Juju
 - <https://insights.ubuntu.com/2016/01/21/introduction-deploying-openstack-on-maas-1-9-with-juju/>
- juju
 - <https://jujucharms.com/docs/stable/getting-started>
 - <https://jujucharms.com/q/?text=openstack>
- MAAS
 - <https://docs.ubuntu.com/maas/2.3/en/>
- etc
 - <https://jujucharms.com/openstack-base/>
 - https://www.youtube.com/results?search_query=juju+maas