CANONICAL

# **MAAS and Juju**
# Introduction

Leonardo Borda
Technical Account Manager

Presented at the:
http://www.devopsmtl.com
March 2014

# Agenda

**+ INTRODUCTION**

A few things about Canonical

1 MAAS

2 Juju

3 Hands-on demo

4 Questions!

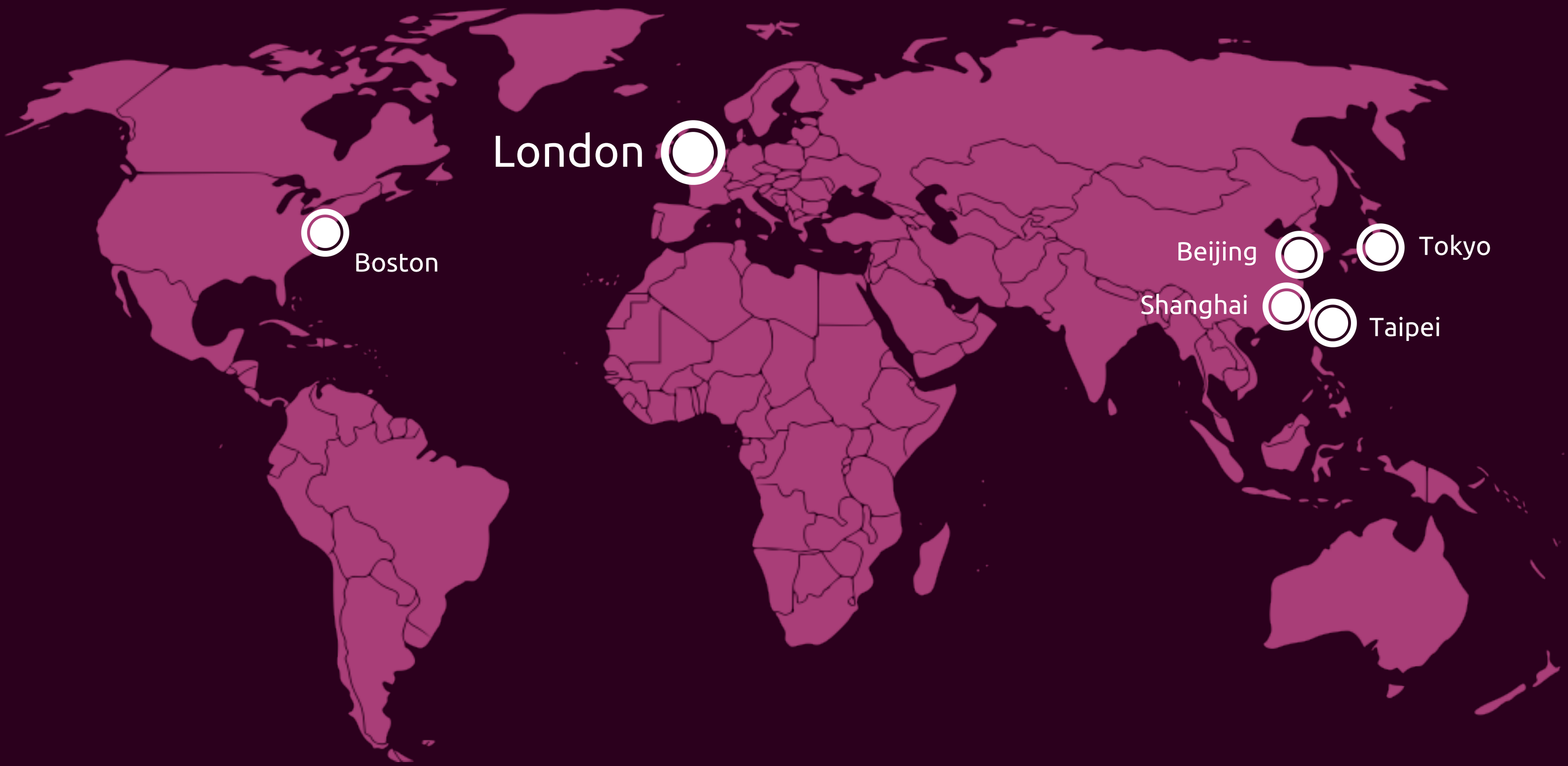
# A few things about Canonical

We are the company behind Ubuntu.

**2004**
FOUNDED

**600+**
EMPLOYEES

**30+**
COUNTRIES



# Two main areas

Desktop, Tablet & Mobile Ubuntu

openstack™
juju
MAAS
LANDSCAPE

Server & Cloud Infrastructure

# What we offer

**Ubuntu**
The Cloud OS

**OpenStack**
The Cloud Infrastructure

LANDSCAPE

**Landscape**
Cloud Management

**Juju**
Service Orchestration

# MAAS

*Hardware provisioning with Metal-As-A-Service*

1

# MAAS : Metal As A Service

Brings the language of the cloud to physical servers.

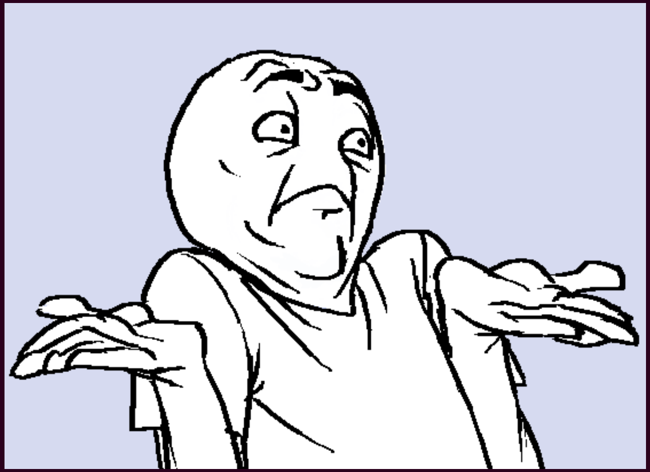
MAAS

1 **Physical servers on demand**
easily scale up and scale down

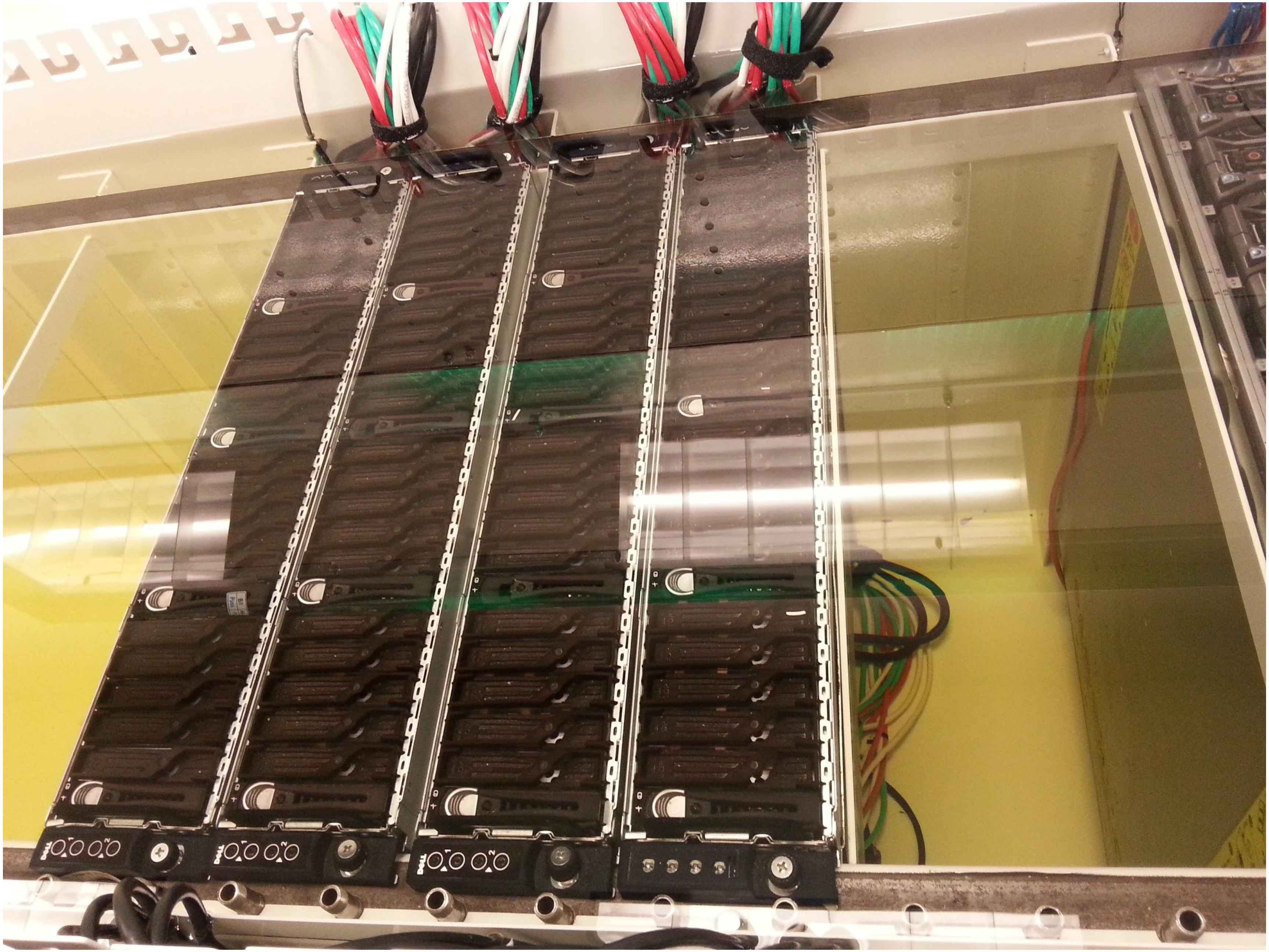
2 **Hardware discovery and inventory**
for policy based management

3 **Orchestration of workloads via Juju**
on bare metal hardware.

Do I really need MAAS ??

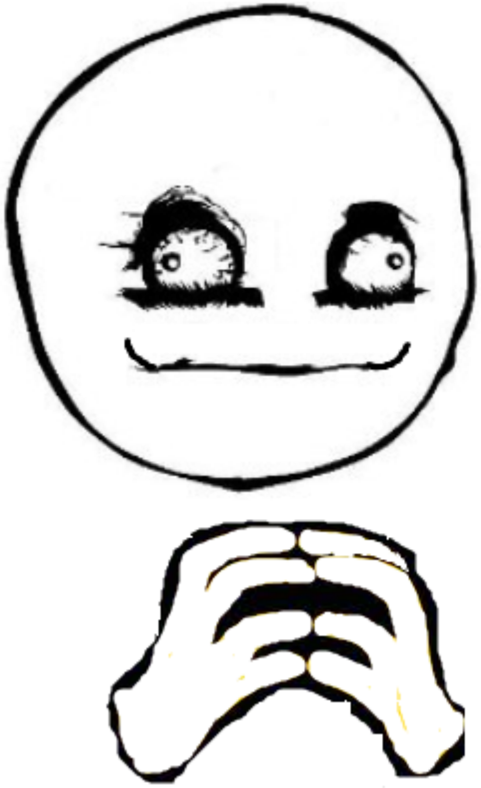


*Texas* Advanced Computing Center



*Texas* Advanced Computing Center

# MAAS : Metal As A Service



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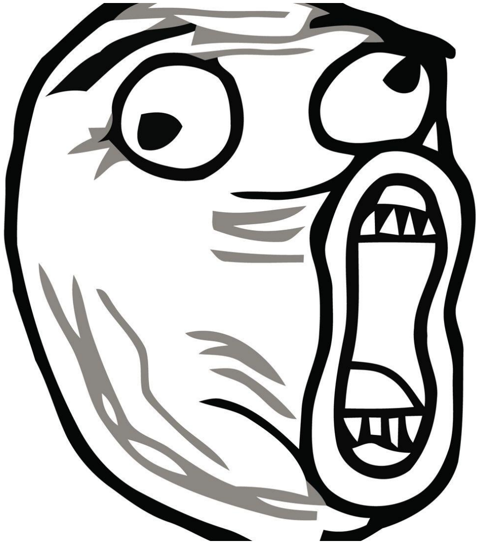
# MAAS : Metal As A Service



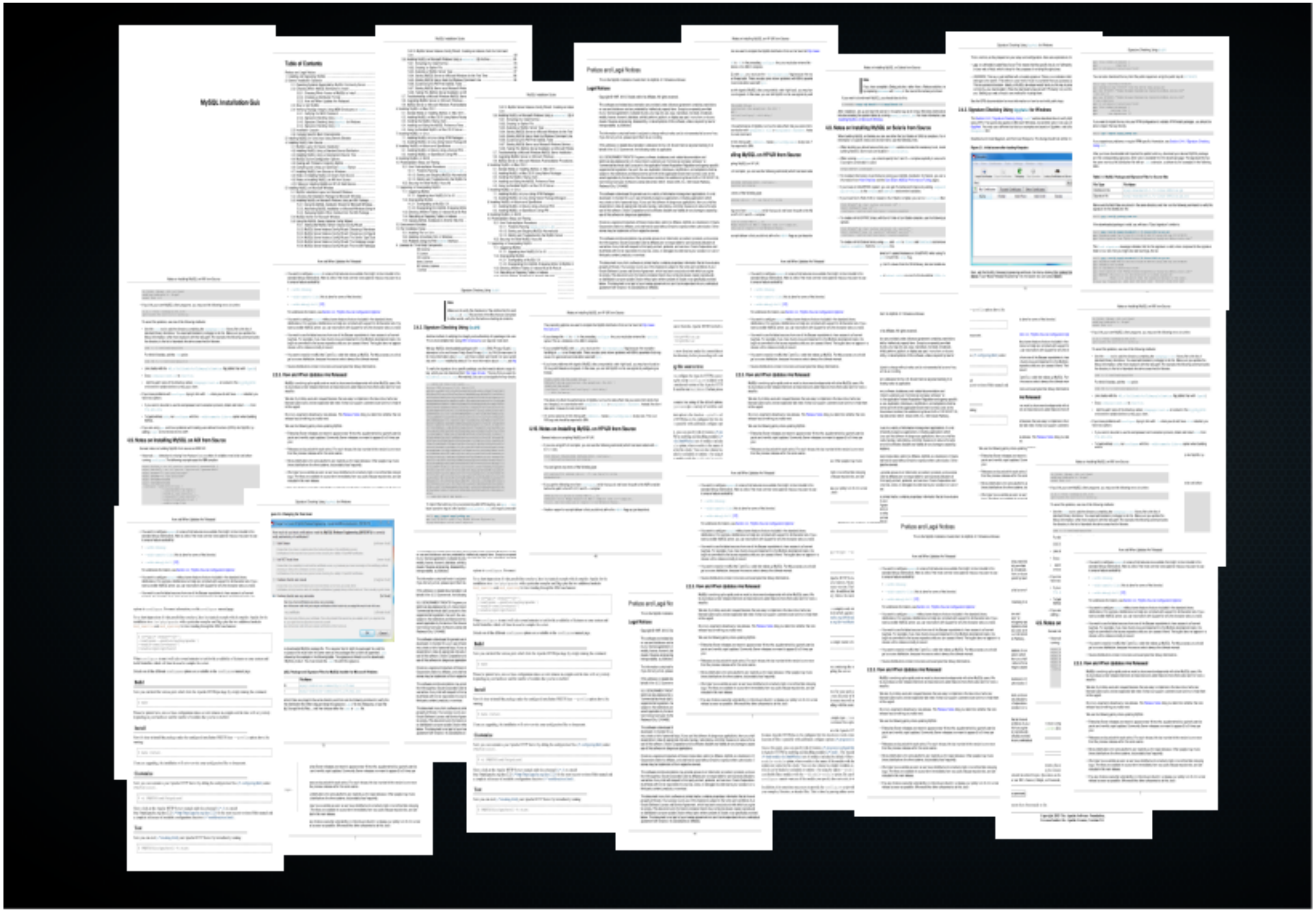
**I like the old way. Okay?!**

- setup pxeboot, tftp
- setup dhcpd, bind
- setup preseed files, .ks, scripts, etc...

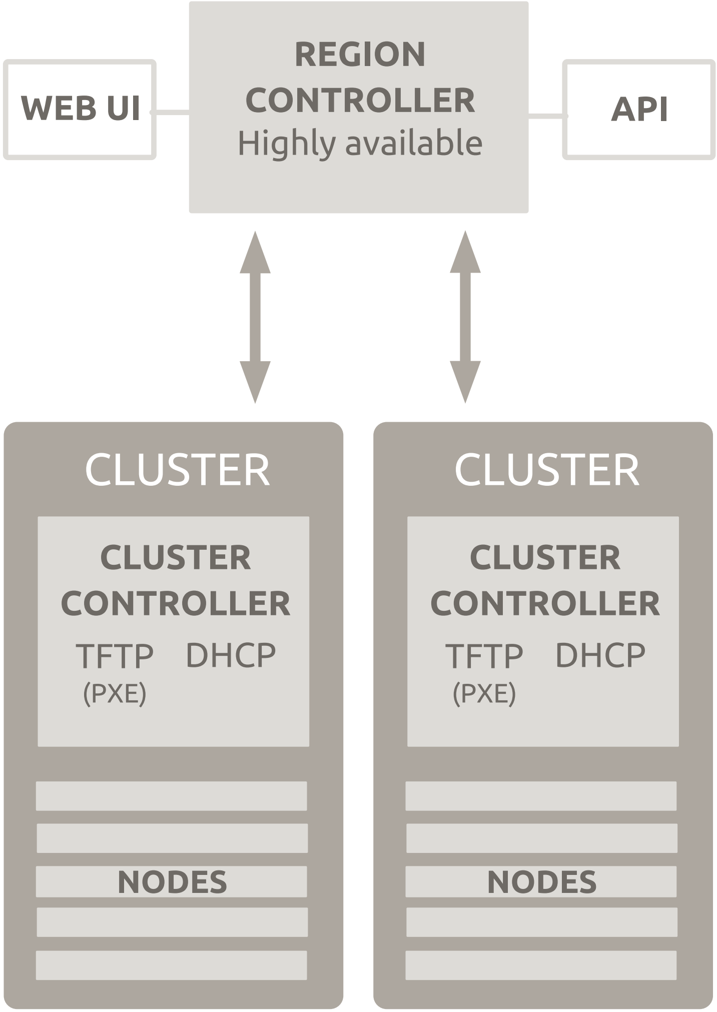
Drawbacks:

- No fancy GUI
- No API
- No 3-step provisioning process
- No Hardware inventory

# MAAS : Metal As A Service



# MAAS Architecture



**Cross data centers provisioning** and visibility

Controllers **deployment** in HA mode

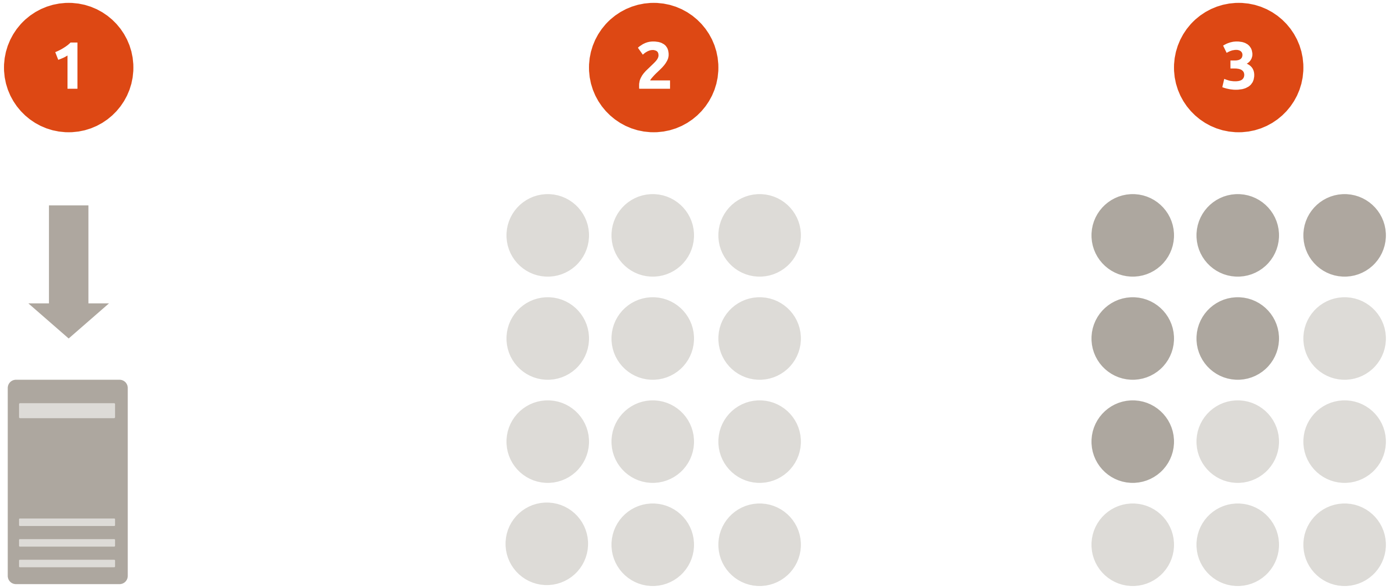
**Supports cluster grouping constructs** to provide visibility into large pools of hardware

**API and UI interfaces**

**Landscape Integration** to deliver role-based access controls, higher level view

# Rapid provisioning at cloud scale

## 3-step provisioning process



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**Install MAAS on first server**

2

**Discover Nodes**

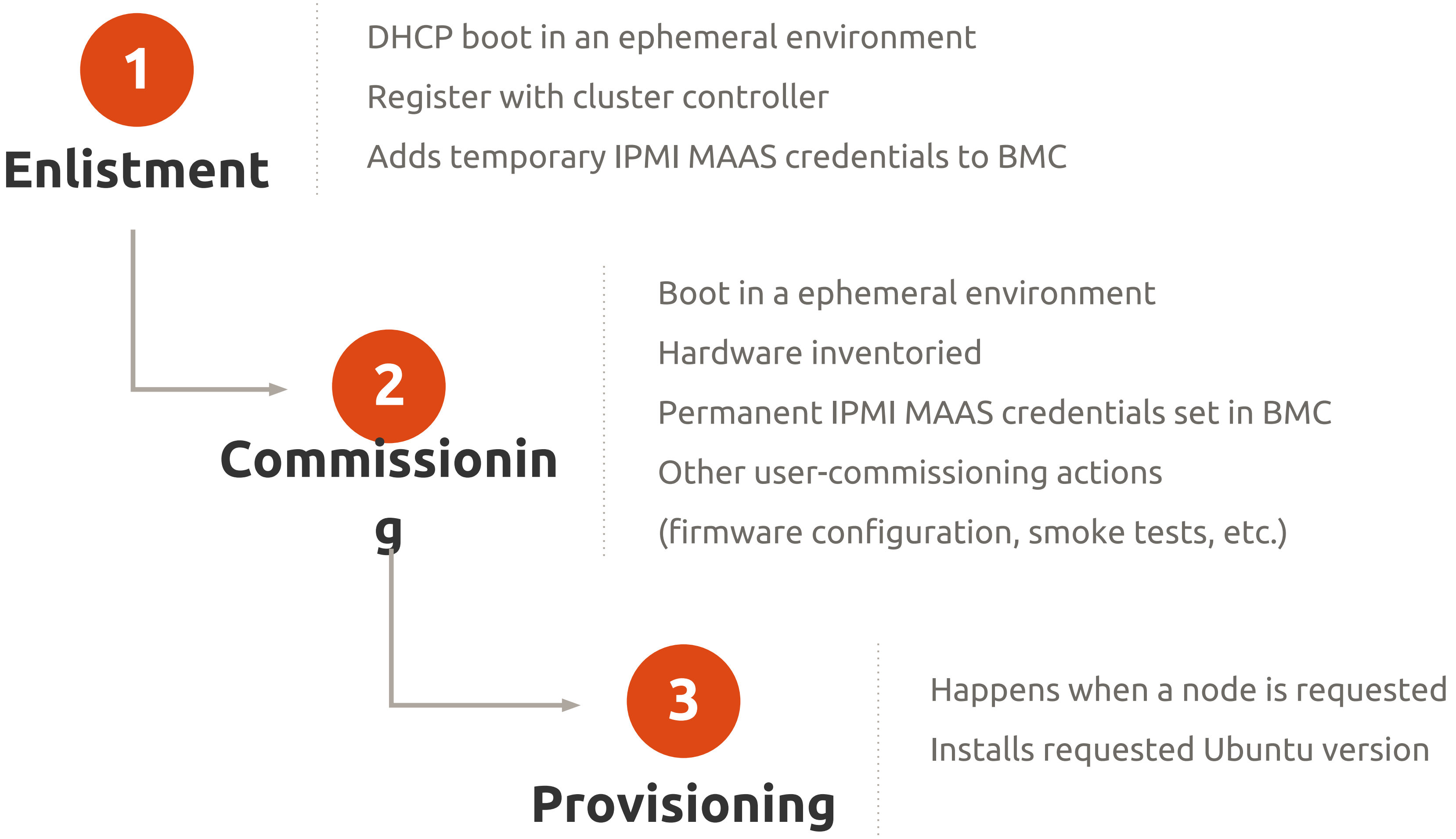
Automatically discover nodes
Enlist nodes via PXE boot
or manually enter MAC addresses

3

**Power on Nodes**

Hypervisor or OS
provisioned automatically

# Hardware provisioning workflow



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**Enlistment**

DHCP boot in an ephemeral environment

Register with cluster controller

Adds temporary IPMI MAAS credentials to BMC

2

**Commissionin
g**

Boot in a ephemeral environment

Hardware inventoried

Permanent IPMI MAAS credentials set in BMC

Other user-commissioning actions

(firmware configuration, smoke tests, etc.)

3

**Provisioning**

Happens when a node is requested

Installs requested Ubuntu version

# Installing MAAS

Two options:

- from the Ubuntu Server boot media
- from the archive ( described below )

```
$ ssh-keygen -t rsa
$ sudo add-apt-repository cloud-archive:tools
$ sudo apt-get update; sudo apt-get upgrade
$ sudo apt-get install maas maas-dhcp maas-dns
```

Post-install tasks

```
$ sudo maas createadmin --username=root --email=MYEMAIL@EXAMPLE.COM
```

Get the MAAS Api Key <key> through the GUI or through this hack script

```
$ maas login <profile-name> http://<hostname_or_ip>/MAAS/api/1.0 <key>
```

Add user’s ssh key

```
$ pub=$(cat /home/lborda/.ssh/id_rsa.pub)
$ maas-cli maas sshkeys new "key=${pub}"
$ maas-cli maas sshkeys read <id>
```

...

# Installing MAAS continued...

Configuring DHCP and DNS.

```
$ uuid=$(maas <profile-name> node-groups list | grep uuid | cut -d\" -f4)
$ maas <profile-name> node-group-interface update $uuid eth0 \
      ip_range_high=192.168.123.200   \
      ip_range_low=192.168.123.100    \
      management=2                  \
      broadcast_ip=192.168.123.255    \
      router_ip=192.168.123.1        \
```

# How to help or get helped

The two channels you can use to get help debugging a MAAS issue are:

- ❑ The Ask Ubuntu website.
- ❑ The Freenode #maas IRC channel.

Report bugs:

- ❑ https://bugs.launchpad.net/maas

Check out MAAS it’s open source:

- ❑ https://launchpad.net/maas

# Automating workloads with Juju

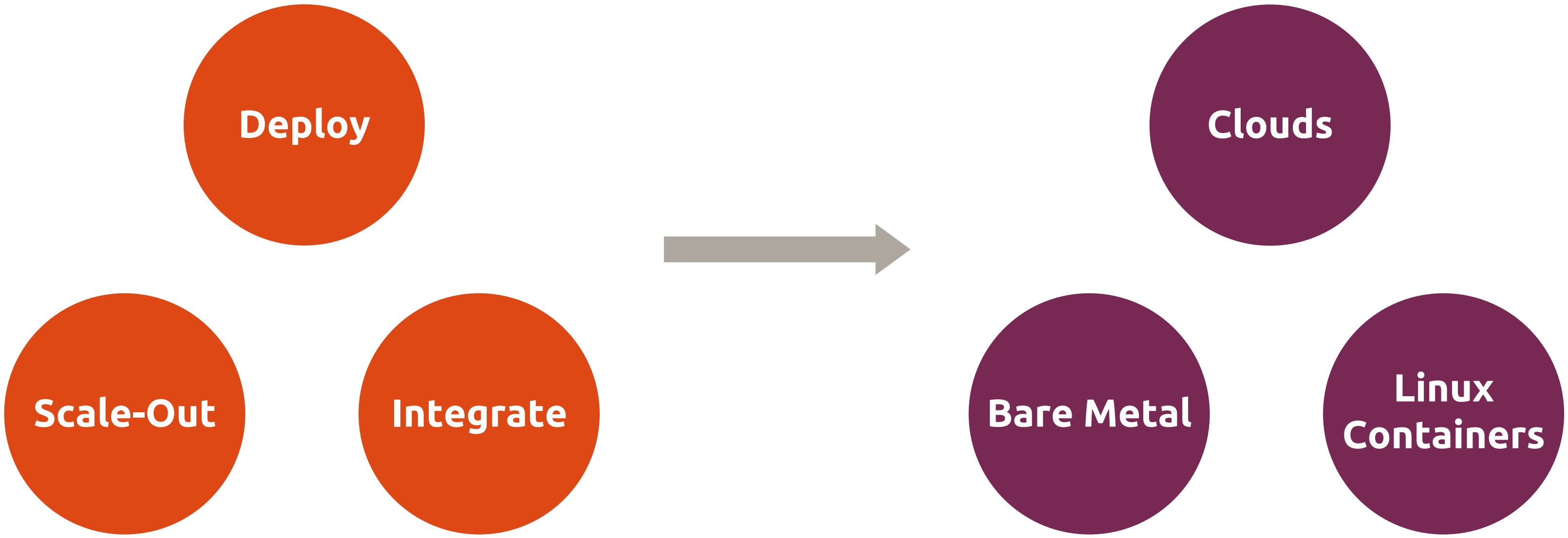
*Applications.*
*Anywhere.*
*Instantly.*

2

# Application deployment at radical velocity

## What can you do with Juju ?

## On which platforms ?



Deploy

Scale-Out

Integrate

Clouds

Bare Metal

Linux Containers

# What's Juju anyways?

**Deb Packages (host level)**

```
$ apt-get install -y cowsay
```

**Your infrastructure (services)**

```
$ juju deploy <my_custom_app>
```

**juju provides you with sharable, reusable, and repeatable expressions of devops best practices**

# Why use Juju?

The best solution to orchestrate your services

## Ease of provisioning

Pluggable provisioning backend, from local machines to large clouds

## Event-based

React to changes in environment, self configuring

## Scalable

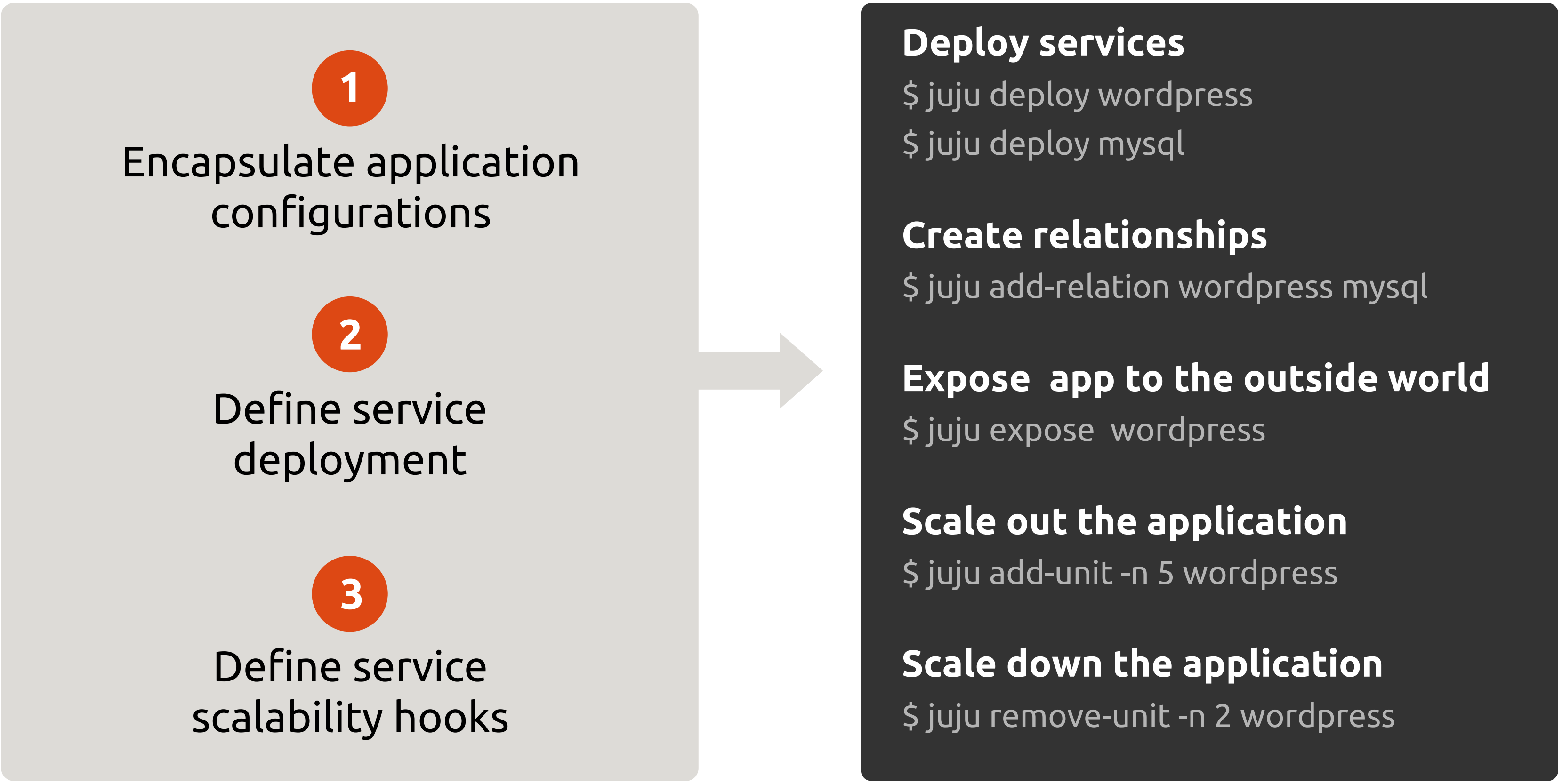
Templates designed to scale by adding more units

## Language independence

Hooks can be written in any language

# Charms package services

Bundle charms and instantly deploy these solutions



## Service definition

1

Encapsulate application configurations

2

Define service deployment

3

Define service scalability hooks

## Instant deployment

**Deploy services**

```
$ juju deploy wordpress
$ juju deploy mysql
```

**Create relationships**

```
$ juju add-relation wordpress mysql
```

**Expose  app to the outside world**

```
$ juju expose  wordpress
```

**Scale out the application**

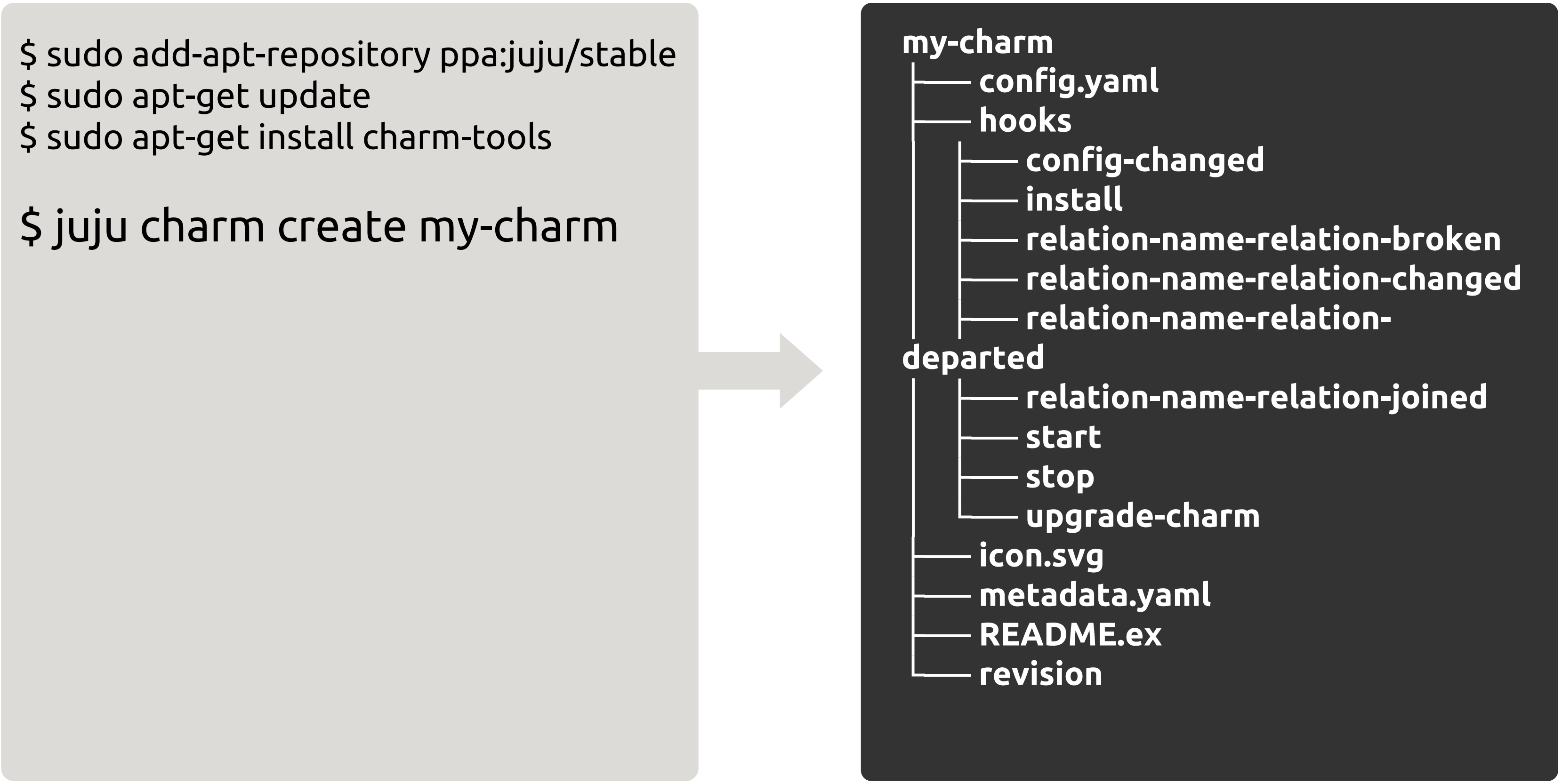
```
$ juju add-unit -n 5 wordpress
```

**Scale down the application**

```
$ juju remove-unit -n 2 wordpress
```

# Anatomy of a Charm

Create charms and deploy your services



## Charm Tools

```
$ sudo add-apt-repository ppa:juju/stable
$ sudo apt-get update
$ sudo apt-get install charm-tools

$ juju charm create my-charm
```

## Instant deployment

```
my-charm
 ├── config.yaml
 ├── hooks
 │    ├── config-changed
 │    ├── install
 │    ├── relation-name-relation-broken
 │    ├── relation-name-relation-changed
 │    ├── relation-name-relation-
departed
 │    ├── relation-name-relation-joined
 │    ├── start
 │    ├── stop
 │    └── upgrade-charm
 ├── icon.svg
 ├── metadata.yaml
 ├── README.ex
 └── revision
```

# A growing Charm ecosystem

Hundreds of charms are available today

**Publicly available** Charm Store

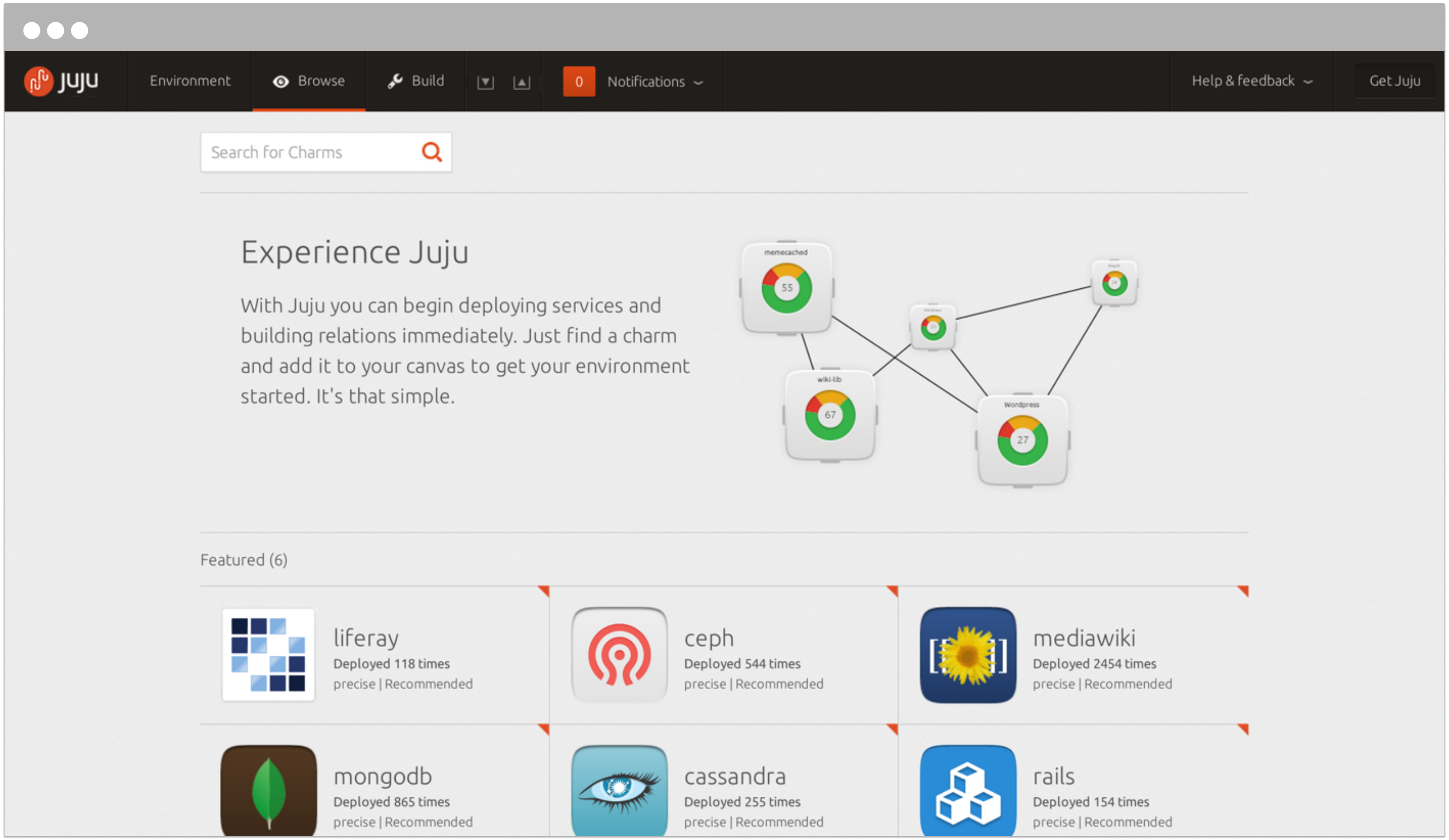
Charms are **rated and reviewed** for quality assurance

Support for **private and mixed mode** Charm store

**Drag and drop** Charms to create services

# Juju GUI Store

## Configure and manage your services



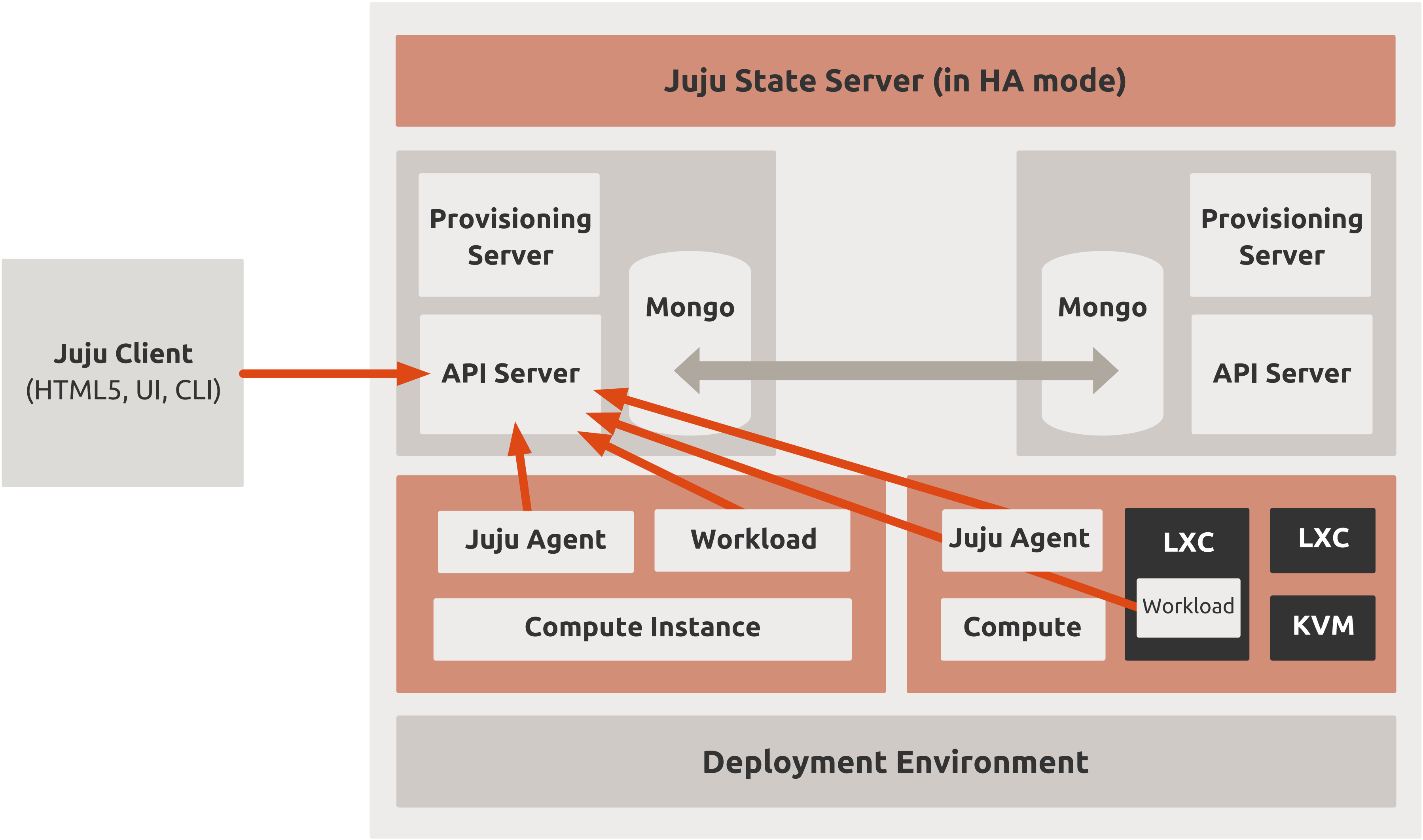
Experience Juju

With Juju you can begin deploying services and building relations immediately. Just find a charm and add it to your canvas to get your environment started. It's that simple.

Featured (6)

| | | |
|---|---|---|
| liferay<br>Deployed 118 times<br>precise \| Recommended | ceph<br>Deployed 544 times<br>precise \| Recommended | mediawiki<br>Deployed 2454 times<br>precise \| Recommended |
| mongodb<br>Deployed 865 times<br>precise \| Recommended | cassandra<br>Deployed 255 times<br>precise \| Recommended | rails<br>Deployed 154 times<br>precise \| Recommended |

# Juju Architecture



# Installing Juju

1. Install Juju

```
$ ssh-keygen -t rsa (if you don’t have one)
$ sudo add-apt-repository ppa:juju/stable
$ sudo apt-get update && sudo apt-get install juju-core
```

2. Generate base ~/.juju/environments.yaml configuration file

```
$ juju generate-config
```

3. Configure to use a particular cloud provider.
Modify ~/.juju/environments.yaml to suite one or more of the following cloud providers:

- Configuring for Amazon AWS
- Configuring for Windows Azure
- Configuring for HP Cloud
- Configuring for OpenStack
- Configuring for MAAS
- Configuring for LXC local provider (Linux)

3. Final step: bootstrap the environment

```
$ juju bootstrap -v
$ juju status
```

4. If you want to destroy the environment

```
$ juju destroy-environment
```

# How to help or get helped

The three channels you can use to get help debugging a MAAS issue are:

- ❑ The Ask Ubuntu website.
- ❑ Join the mailing list.
- ❑ The Freenode #juju IRC channel.

Report bugs:

- ❑ Report Bugs

Check out Juju it's open source:

- ❑ https://launchpad.net/juju-core

# DEMO

- Deploy wordpress using MAAS + Juju
  - Scale up
  - Scale down

Other cool stuff

- Running juju locally on lxc containers

# Questions ?

4

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# Thank you!!

**Leonardo Borda**
leonardoborda@gmail.com / leonardo.borda@canonical.com
#IRC-freenode: lborda
blog: http://leonardoborda.com