

OpenStack - AutoScale

Auto deploy VMs and apps from Bare-Metal

mark.joiner@gtt.net

Technical Manager – Advanced Solutions



spin

'spin: to describe (something, such as an event) in a certain way in order to influence what people think about it

Decisions decisions...

❖ Hardware:

- ❖ Monolithic with multiple VMs
- ❖ Cloud based (AWS GCP Rackspace ...)
- ❖ Blade Server
- ❖ NUC servers + containers

❖ Linux Platform:

- ❖ Canonical, RedHat, SuSe, Debian, VMWare ...

❖ Openstack version?

- ❖ Mitaka, Newton, Ocata, Pike, Queens, Rocky?

Installation Components

- Ubuntu Desktop 18.04.5 - bionic
- MAAS 2.4 - bare metal provisioning
- Juju 2.4.4 - cloud controller
- OpenStack - Rocky



Hardware - Gigabyte BRIX
legacy hardware - bad choice! flakey BIOS



Hardware - Intel NUC (Next Unit of Computing)
recent hardware - good choice! with Intel AMT

Highlighted Features

- 1 8th generation Intel® Core™ i5-8259U processor
- 2 Iris® Plus Graphics 655
- 3 Two DDR4 SO-DIMM sockets (up to 32 GB, 2400 MHz)
- 4 1x SATA3 port for connection to 2.5" HDD or SSD (NUC8i5BEH)
- 5 M.2 slot with flexible support for a 42 or 80 mm M.2 SSD
- 6 Intel® Optane™ memory ready (up to 32 GB, NUC8i5BEH)
- 7 Intel® Dual Band Wireless-AC 9560 and Bluetooth® 5.0
- 8 Back panel DC power connector (12–19V)
- 9 HDMI® 2.0a display port supporting 8 channel audio (7.1 surround sound)
- 10 Intel® Gigabit LAN
- 11 Two USB 3.1 ports on the back panel
- 12 Thunderbolt™ 3 USB Type-C port providing DisplayPort® 1.2 or USB 3.1 gen 2
- 13 Kensington lock support
- 14 Support for user-replaceable third-party lids
- 15 Micro SD card slot
- 16 Consumer infrared sensor
- 17 Two USB 3.1 ports (including one charging port) on the front panel
- 18 Front panel headphone/microphone jack
- 19 Front panel power button
- 20 Dual-array front microphones

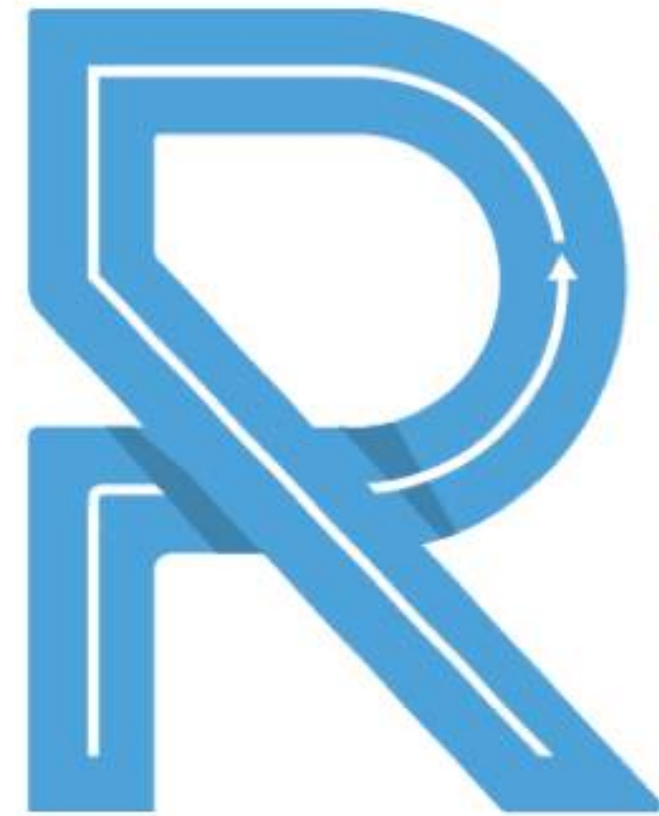


Features

appreciated: Intel AMT – vPro
 missing: dual lan, serial port

Setup

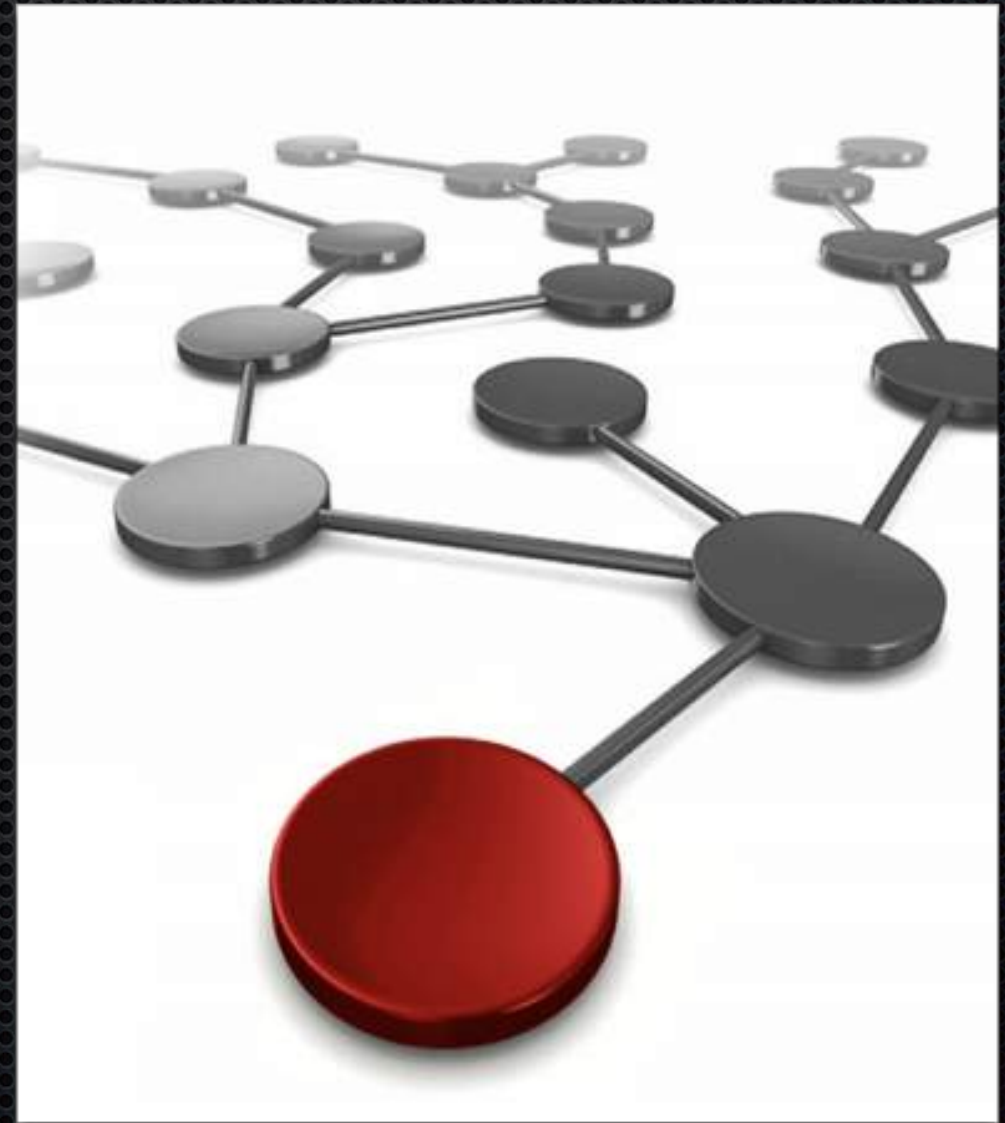
1. Install OpenStack



**OPENSTACK
ROCKY**

OpenStack cluster deployment

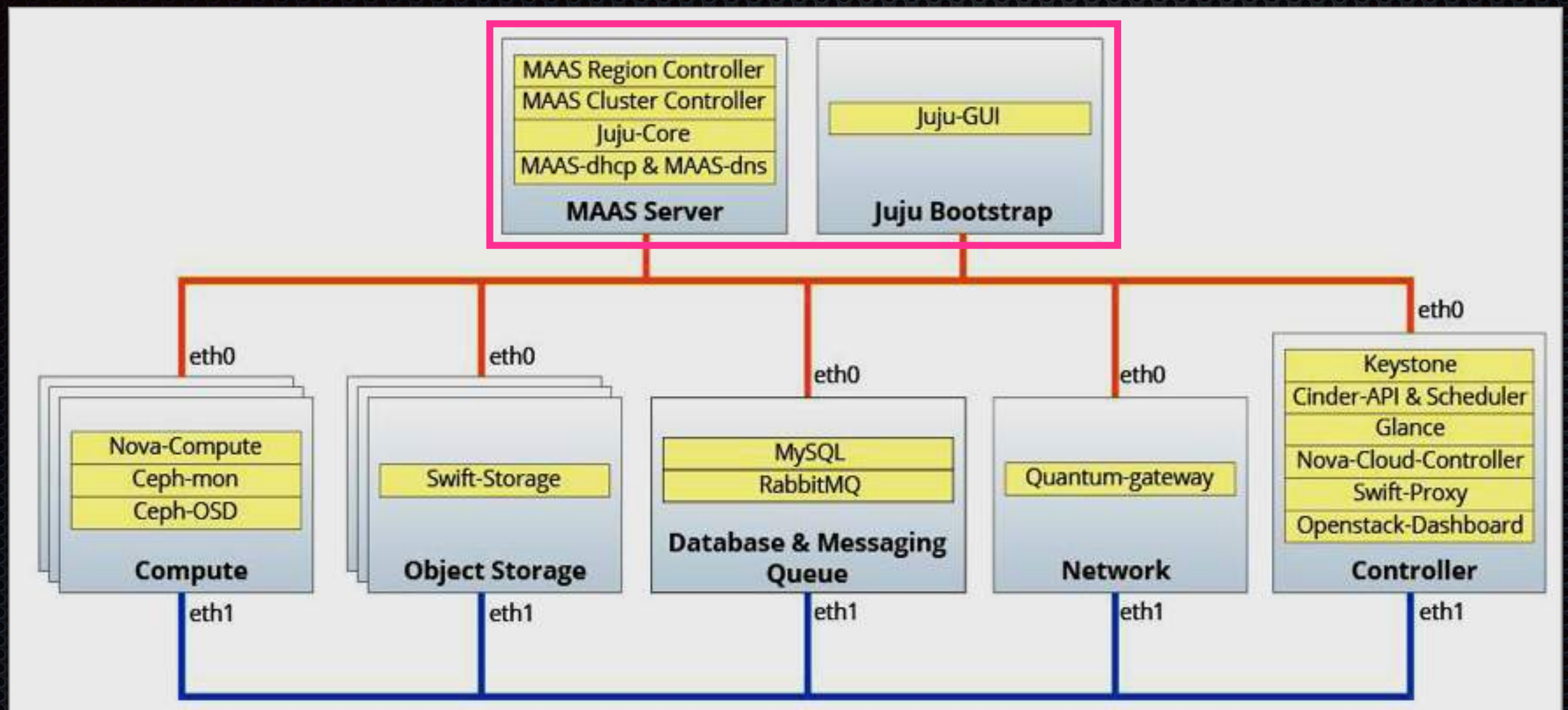
- ❖ Bare metal servers
- ❖ At least 4 servers required, each with 8 GB RAM, IPMI BMCs, dual NICs
- ❖ Network switch
- ❖ Router port, gateway to Internet
- ❖ Simple HA architecture supported
- ❖ Scalable from 12 to 200 nodes



Lab - Node Architecture

- 1 Node - MAAS
- 1 Node - Juju Controller
- 4 Nodes - OpenStack
- 2 Networks
 - PXE boot net
 - Internet





Overview - 6 Nodes + 1(nova)

MAAS installation

- ❖ Install Ubuntu Server or Desktop 18.04 LTS on Maas/Juju server
 - ❖ `sudo apt update`
 - ❖ `sudo apt install maas`
 - ❖ `sudo maas init`
 - ❖ configure subnet and DHCP
 - ❖ sync VM images
 - ❖ register hardware nodes (servers/network infrastructure)

OpenStack installation

- ❏ `sudo add-apt-repository -u ppa:juju/stable`
- ❏ `sudo apt install juju`
- ❏ `juju add-cloud mymaas`
- ❏ `juju add-credential mymaas. (admin)`
- ❏ `juju bootstrap --constraints tags=juju mymaas maas-ctrl`
- ❏ `juju deploy open stack.bundle`

Autoscaling compute nodes

- monitor/detect load threshold or failed node
- launch new machine (from bare-metal)
- deploy new server
- deploy applications or application bundle
- define relations



scale-in

monitor load threshold
schedule cluster size



deflate-cluster

- stop/migrate services
- stop instance
- stop or delete node





Recorded demo - autoscale

“Getting information of the Internet is like taking a drink from a fire hydrant.”

– *Mitchell Kapor*