Dive into OpenStack

INTRODUCTION TO OPENSTACK
About me - John Griffith

- Open Source Software developer
- Started the Block Storage project in OpenStack back in 2011
- Currently employed at NetApp
- Principal Engineer, working on “cloudy” things
  - OpenStack
  - Docker
  - Kubernetes

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Virtualization

In the beginning, there was the VM; and it was good....

But then we started having VM sprawl, VM’s sitting idle on servers back in the corner that nobody knew anything about

We weren’t using resources efficiently at all

Allocating resources to go with the VM (storage, networking etc) was still an Admin task in most cases
Introducing “The Cloud”

Amazon introduced AWS back in 2006

Mostly just a way to run Object Storage and Compute off-prem

Everything’s self-service via the Web

This was even better, want to try out some new code? Swipe your credit card, spin up and Instance, hack a while, then delete it all and release it back into the pool
Pools of resources

The key benefit of Cloud is to provide Self Serve Infrastructure as a Service and create pools of resources.

No more lone servers off in the corner, all equipment is for the benefit of the collective.

Details of the underlying hardware, devices and capacity are all abstracted away and hidden from the end-user.

Need a network, click a button; Need a VM, click a button; Need some storage... well you get it.

Enter the beginning of the developer-centric world.
Birth of OpenStack

Some folks at NASA were fighting with resource availability and had seen some of the things going on with AWS

Thought “why not create our own internal AWS”

Turns out a company called Rackspace was on the same track

NASA and Rackspace got together and created OpenStack

Open Sourced all of it, and turned it into a Foundation
A “Cloud Operating System”
The community

Fully Open Source, hosted on Github

- Number of contributors: 72,465
- Number of sponsoring/supporting companies: 658
- Lines of Code: >20 Million
- All written in Python
Early days were all about Public Cloud

Infrastructure as a Service for Service Providers

Rackspace Cloud, HP Cloud, Cisco Cloud...

An Open Source platform for Service Providers to build a competitive alternatives to AWS
Getting back to the roots and Private Cloud

Competing with AWS (and now Google and Microsoft) is no easy task

But turns out, what a lot of people really wanted was an on premise Private Cloud

Vmware and VSphere are pretty awesome, but they’re pretty expensive and they’re not exactly automation friendly.

Around 2013 there was a lot more focus on OpenStack for Private Cloud
No longer just Infrastructure as a Service

Six base services focused on Infrastructure

13 additional services adding everything from Hadoop to Key Management

Most recently with the buzz of Containers (Docker) we’ve even moved into Containers as a Service models
How it works

Create a user

Assign quotas to user

Provide credentials to the user

User is allowed to utilize whatever resources he/she desires according to their quota
Overview

Limit Summary

Instances
Used 4 of 20

VCPUs
Used 12 of 48

RAM
Used 16GB of 500GB

Floating IPs
Used 9 of 10

Security Groups
Used 2 of 10

Volumes
Used 0 of 100

Volume Storage
Used 0 bytes of 9.8TB

Usage Summary

Select a period of time to query its usage:

From: 2017-04-04 To: 2017-04-05

Active Instances: 4 Active RAM: 16GB This Period's VCPU-Hours: 755.65 This Period's GB-Hours: 3426.69 This Period's RAM-Hours: 1187680.91

Usage

<table>
<thead>
<tr>
<th>Instance Name</th>
<th>VCPUs</th>
<th>Disk</th>
<th>RAM</th>
<th>Time since created</th>
</tr>
</thead>
<tbody>
<tr>
<td>thin-stack</td>
<td>8</td>
<td>20GB</td>
<td>8GB</td>
<td>3 weeks</td>
</tr>
<tr>
<td>devbox</td>
<td>1</td>
<td>20GB</td>
<td>2GB</td>
<td>2 weeks, 6 days</td>
</tr>
<tr>
<td>ndvp</td>
<td>2</td>
<td>5GB</td>
<td>4GB</td>
<td>1 week, 1 day</td>
</tr>
<tr>
<td>test-1</td>
<td>1</td>
<td>20GB</td>
<td>2GB</td>
<td>4 days, 23 hours</td>
</tr>
</tbody>
</table>

Displaying 4 Items
You’re probably tired of slides....

Let’s log on to an OpenStack Cloud and check things out!
Wanna try it out for yourself?

The community provides a tool called “devstack”

* Let’s you deploy an “All In One” OpenStack deployment on a Virtualbox VM
* Can specify what services you want (or don’t want)
* Vagrant boxes are also available

Run it on your Mac or Windows machine in an Ubuntu VM

https://docs.openstack.org/developer/devstack/

NOTE: This can be tricky and somewhat frustrating, if you’re really interested and get stuck, I’m happy to help!