Compass – A Streamlined OpenStack Deployment System

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Outline of This Talk

1. Scope of Problem for Compass
2. Compass Explained
3. DRY, Truly Open Deployment
Compass at a Glimpse

Think Big, Start Small

- A General System to Deploy Distributed Systems, Extensibility as a Primary Design Goal
- Not Limited to OpenStack, but Streamlined Our OpenStack Deployment Like a Charm

To Be Open Sourced – Apache 2.0 Soon

- 100% Python, 5000 Line of Python Code
- Successfully Deployed Several Dogfood Clusters
- Compass Wiki Page: https://wiki.openstack.org/wiki/Compass
Data Center as a Computer

Open Cloud OS (OpenStack)

- Linux
- eth0, lo
- /proc
- /dev
- NIC
- CPU
- Disk

Open Deployment (Compass)

- Live CD / GRUB

OpenStack Control Channel

HW/SW Configuration Deployment Channel

LILO/GRUB/LiveCD for OpenStack
Why We Are Doing This?

Full HW Portfolio in Data Center

- No.1 as Storage Revenue Growth
- No. 2 as `x86 Server Revenue Growth
- Needless to Say, Networking Gears..

OpenStack Makes the Above a Full Cloud Solution

Global Excellent Telecom Cloud Solution Provider of year 2012
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A Life of Deployment – How to Streamline All Controls

Plus a lot of scripts:
- Boilerplate
- Target system description

Chef / Puppet / ...
Cobbler / Razor / ...
IPMI
SNMP
Compass Philosophies – Programmability and Extensibility

**Programmability – To Be a Programmable Framework**

- A Restful API service instead of a web app

**Extensibility – NOT To Be A Conglomerate**

- Functional modules with **plug-in architecture** (e.g., 200 Loc to support HP Switch)
- Carefully designed boundary to mature tools like Cobbler, Chef and etc.
- Work WITH the above tools, not to replace any of them.
Compass Internals

Compass -- Open Source

- Huawei UI
- Rest Client
- 3rd Party ISV UI
- Restful API Server
- Message bus (RabbitMQ)
- DB
- Hardware Discover
- Package Deployment
- OS Provisioning
- Huawei Plugin
- microkernel
- Chef plugin
- Ansible plugin
- Cobbler plugin
- Razor plugin

Compass -- Open Source

- Message bus (RabbitMQ)
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- Cobbler plugin
- Razor plugin
Currently we use Chef as deployment management Engine

Puppet or Ansible devopers, we want to work with you

Networking gear based bare metal discovery (topology awareness)

Currently we are working on RAID Controller for Huawei

OCP community, what’s your thought
NOT to Be Conglomerate – Roles in the System

- **App writer**
- **Lib writer**
- **Compass**
- **Chef-Server**
- **Cobbler-server**

**Diagram Details:**
- **Policy Databag (e.g., exclusive; default)**
- OpenStack Cookbook
- Snippets kickstart files

**Restful Reqs** from App writer to Compass
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Extensible in Use Cases

Distributed System

Hardware

OS

ESXi?
Windows Server?
CentOS
Ubuntu

OpenStack
Hadoop
Ceph?

OCP?

Huawei

HP
Extensible in Tool Chain

OS Provisioning Tools

- Cobbler
- Razor

Configuration Management Tools

- Chef
- Puppet
- Ansible
- Salt
To Summarize

Open Sourced under Apache 2.0

- General Purpose Deployment System (Ultimate Goal)
- Deploys OpenStack Cloud Infrastructure Smoothly (Dogfoods Done)
- Restful API: Allow Third-party UI Integration

Open to Collaboration

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Real Demo

- Video Clips Recording Our First Deployment
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