Build your own Web Portal using OpenStack APIs and Services

OpenStack Summit in Austin 2016

April 27, 2016
IBM Japan Systems Engineering Co., Ltd.
Machi Hoshino
Outline

• Introduction
• What is OpenStack
• Building your own Web Portal
• Future
• Summary
Introduction
Who Am I?

Machi Hoshino 星野 真知
IBM IT Specialist in IBM Systems Engineering Japan.
Five Years of Experience in IBM Power Systems Field.
Currently Supporting IBM Cloud Delivery, and Technical Support for OpenStack

IBM Systems Engineering Japan.

Our experience with clients

- **Mizuho Bank, Ltd**
  「IBM Power Systems」でプライベート・クラウドを構築
  https://ibm.biz/BdHJTT

- **Toshiba**
  スマートコミュニティの実現を目指しオープンなクラウド基盤構築を進める
  https://ibm.biz/BdHJTk

- **Kirin**
  キリンがOpenStackでインフラ刷新、サーバー構築コストを4分の1に
  https://ibm.biz/BdH9jj

- **JFE Steel Corporation**
  JFEスチール、基幹業務のハイブリッド・クラウドを推進
  https://ibm.biz/BdHJT6
How OpenStack is received in Japan?

• We had our “OpenStack Summit” on Oct 2015
• LPI-Japan opened OPCEL (Certified Exam for OpenStack Professional) on OCT 2015
• IDC annalists announced that the OpenStack market in Japan will grow 114% per year.

https://ibm.biz/Bd4y42
How OpenStack is received in Japan?

- Outcomes that Japanese Company’s obtained with OpenStack

  Toshiba:
  Achieved common service menu, unified operation, and rapid application delivery
  https://ibm.biz/BdHAQ9

  Kirin:
  75% cost reduction of a single server build
  https://ibm.biz/Bd4dcA

  JFE Steel Corp:
  Estimated time reduction of system building from 2 month to 10 days
  https://ibm.biz/Bd4dcC
In Japan
OpenStack is doing Great!
Today I would like to share my experience on

What we did after installing OpenStack
Build your own Web Portal using OpenStack APIs and Services

• Todays abstract
  • Since OpenStack has become widely popular in Japan, we now need to explore how we can use OpenStack
  • So In this session ...
    • Recap, on what OpenStack is.
    • With demos, we will share our motivation for building a web portal based on OpenStack.
What is OpenStack?
What is OpenStack?

- OpenStack abstracts compute, network, and storage.

Applications only need to care about the OpenStack API.

IaaS functions are provided by Openstack.

OpenStack converts the API into the actual Hardware API.
Why does it have to be OpenStack?

- From the application point of view ...
  - Provides Out-of-the-Box frameworks for integrating Compute, Network, and Storage. Every procedure of the IaaS Layer will not be needed to be expressed on the application.
  - The application can be exported and imported to any OpenStack platform
  - With no code change, we can access to proprietary hardware solutions
OpenStack is not just IaaS

The commonly used functions are defined as “Core Services”

Optional Services belong to the “Big Tent”
If OpenStack is so great why not let it do everything?
If OpenStack is so great why not let it do everything?
Can OpenStack solve everything?

• Currently the answer is “no”
  • Each OpenStack project have different maturity.
  • Not everything is implemented in OpenStack
  • OpenStack is difficult

OpenStack Project Navigator
https://ibm.biz/Bd4DSR
OpenStack is difficult?

I want a WordPress Server

Here’s your WordPress Server

OpenStack

OpenStack Summit in Austin 2016
OpenStack is difficult

User:
I want a WordPress Server

Reality!

- Config your Neutron Network
- Spin your Nova VMs
- Create Cinder disks
- Give me some sort of install script
- Add your nodes to the load balancer

User:
Oh • • •
What is OpenStack? ~ Summary

• **OpenStack**
  • Abstracts Compute, Network, and Storage.

• **OpenStack cannot solve everything**
  • We should not let OpenStack do everything

• **OpenStack is difficult**
  • OpenStack itself needs more abstraction

---

We need to develop OpenStack Solution under these conditions
Building your own Web Portal
How to get the best out of OpenStack

![Diagram showing OpenStack APIs and their integration]

OpenStack APIs

Open by design

OpenStack Summit in Austin 2016
How to get the best out of OpenStack

1. Provides service perspective web interface
How to get the best out of OpenStack

1. Provides service perspective web interface
2. The basic IaaS functions of OpenStack should mainly be used
How to get the best out of OpenStack

1. Provides service perspective web interface
2. The basic IaaS functions of OpenStack should mainly be used
3. Missing functions are redeemed by Other Software's Open Standard APIs
Scenario

① Member wants WordPress Servers
I want WordPress so I’ll create my request

② Member customizes server configuration based on request
I want 3 servers with Load Balancing

③ Approver approves the request
Your good to go

④ Server gets provisioned
VIP
Web Server
Web Server
Web Server
DB Server
Demo
Technology used in the demo

- OpenStack API
- Chef API
- OpenStack HEAT
- IBM Cloud Orchestrator
Feature: Automatic Heat template creation

- UI to Template converter built inside IBM Cloud Orchestrator (coded with JavaScript)
  - Software is installed by Chef and Heat plus cloud-config

Heat Templates are created based on user input

WordPress Servers are created with Chef and cloud-config

Heat Template:
- Nova Server
- Cinder Volume
- Neutron LBaaS
- Heat WaitHandler
- Cloud-Config chef

VIP

WordPress Servers:
- Web Server
- Web Server
- Web Server
- DB Server
Feature: Automatic catalog update

- Catalogs are updated by OpenStack and Chef API
  - With the help of REST APIs the UI will be updated with no code change

The catalogs are created by OpenStack REST API

The Catalogs are created by Chef REST API
Demo
Feature: Runs anywhere

- This Web Portal will operate on any chef and OpenStack environment
Demo
Sample: Same technology working on PowerVM Environments
Build your own Web Portal ~ Summary

• To get the best out of OpenStack:
  1. Provide service perspective Web Based Portal
  2. The basic IaaS functions of OpenStack should mainly be used
  3. Missing functions are redeemed by Other Tools

• APIs are the Key Feature to connect the various technologies
Future
Why do we do testings?

- To examine if there is no difference between “how it should look” and “how it actually is”
Tests should also be automated

OpenStack and Chef describes the Environment

Spec Files are Automatically created for Testing

How it Should look

How it actually is
Summary
Build your own Web Portal using OpenStack APIs and Services

• Summary
  • OpenStack ...
    • abstracts Compute, Network and Storage.
    • Does not solve everything
  • We built a Web Portal ...
    • To overcome the considerations of OpenStack
  • APIs are the key features to get the best out of OpenStack.
Thank You!