Must Haves for your Cloud Toolbox

Driving DevOps with Crowbar and Dasein

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Board of Directors, OpenStack Foundation

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The good ol’ days

Innovation

VS

Stability

Developers

Operations
The new world order: **DevOps**
Flexible, agile, able to adapt

**Innovation + Stability**

Breeding a culture of continual experimentation and learning
DevOps in practice

Fail fast and often
Less time in design
Deploy in small increments
WIP limits/slack time
People over process

In Development
- Infrastructure as code
- Version control everything
- Test end-to-end
- Done means released
- Frequent releases
- Instrument operations

Operationally
- Instrument pervasively
- If it’s hard, do it more often
- Re-provision, not repair
- Automate where possible
- If anything fails, stop the line
- Enable graceful degradation
Deploy an OpenStack cloud in ~2 hours

Evolve to meet your needs over time with built in DevOps

Use Crowbar to:

- **Automate** the deployment and configuration of an OpenStack cloud
- **Quickly** provision bare-metal servers from box to cluster with minimal intervention
- **Maintain, upgrade and evolve** your OpenStack cloud over time
- Leverage an open source framework backed by a growing **global developer ecosystem**

Accelerates multi-node deployments
Simplifies maintenance
Streamlines ongoing updates
How Does **Crowbar** Work?

[Diagram showing the workflow of Crowbar]

- **Dell “Crowbar” Ops Management**
  - Crowbar Magic Happens!
  - Run List
  - Config.
  - **Chef Server**
  - **Orchestration State Machine**
  - DHCP

- **Status (post)**
  - Chef-Client
  - Network Config
  - Apps
  - Operating System
  - Hardware Config (uses “Sledgehammer”)
  - PXE Boot
Crowbar User Interface

There are 12 nodes available in the system.

- da4-ba-db-70-f8-74
  - da4-ba-db-17-44-3f
  - da4-ba-db-17-44-3f (Edit)
- da4-ba-db-88-92-07
  - da4-ba-db-88-92-07
  - da4-ba-db-88-92-07

Dashboard | Barclamps | Proposals | Active Roles | Help
---|---|---|---|---
Identify | Power On | Shutdown | Reboot

Full Name: da4-ba-db-17-44-3f.dell.com
Status: Ready
Uptime: 2 hours 36 minutes 25 seconds
Switch Name/Port: da4-ba-db-70-f8-74 / 2
MAC Address: 08:ba:db:17:44:3f
Allocated: true

IP Address: bmc: bmc: 10.168.124.173
    [not managed] eth1:
    eth0: 192.168.124.89

Links: IP Mgmt Interface, Nginx, Chef, Ganglia
Barclamps: Bsys Default, Deployer Default, Dns Default, Ganglia Default, Ipmi Default, Logging Default, Nginx Default, Network Default, Nova Default, Ntp Default, Provisioner Default, Raid Default

Delete | Reset | Reinstall | Hardware Update
---|---|---|---
The Crowbar Project

The Crowbar Project is an effort to build a complete, easy to use operational platform for a large number of physical nodes to be moved from bare-metal to production.

Barclamp List

The following list includes the barclamps that have been developed for Crowbar.


<table>
<thead>
<tr>
<th>Barclamp</th>
<th>Function</th>
<th>Repo URL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crowbar</td>
<td>The roles and recipes to set up the barclamp framework.</td>
<td><a href="https://github.com/crowbar/barclamp">https://github.com/crowbar/barclamp</a></td>
</tr>
<tr>
<td>Deployer</td>
<td>Initial classification system for the Crowbar environment (aka the state machine)</td>
<td><a href="https://github.com/crowbar/deployer">https://github.com/crowbar/deployer</a></td>
</tr>
<tr>
<td>Provisioner</td>
<td>The roles and recipes to set up the provisioning server and a base environment for all nodes</td>
<td><a href="https://github.com/crowbar/provisioner">https://github.com/crowbar/provisioner</a></td>
</tr>
<tr>
<td>Network</td>
<td>Instantiates network interfaces on the crowbar managed systems. Also manages the address pool.</td>
<td><a href="https://github.com/crowbar/network">https://github.com/crowbar/network</a></td>
</tr>
<tr>
<td>Barclamp-IPMI</td>
<td>Configure IP Management Interface (aka BIPOD)</td>
<td></td>
</tr>
<tr>
<td>Barclamp-Deployer</td>
<td>Sets up components of nodes managed by crowbar</td>
<td></td>
</tr>
<tr>
<td>NTP Barclamp</td>
<td>Common NTP service for the cluster. An NTP server or servers can be specified and all other nodes will be clients of them.</td>
<td><a href="https://github.com/crowbar/barclamp-ntp">https://github.com/crowbar/barclamp-ntp</a></td>
</tr>
</tbody>
</table>
“Dell solved a problem that we had. And when Dell solved that problem, our engineers thought, ‘We’re going to use this.’”

Ben Cherian, GM of Emerging Technologies, DreamHost

Crowbar Operations Platform

Proven solutions

A modular, open source framework that accelerates multi-node deployments, simplifies maintenance, and streamlines ongoing updates

- Deploy an OpenStack cloud or Hadoop cluster in hours instead of days
- Use or build barclamps to install and configure software modules
- Supports a cloud operations model to interact, modify, and build based on changing needs

Leverage worldwide expertise

Opscode Chef Server Capabilities

Download the open source software: https://crowbar.github.com

Active community
http://lists.us.dell.com/mailman/listinfo/crowbar

Resources on the Wiki:
https://crowbar.github.com/wiki
https://crowbar.github.com/videos

Rob Hirschfeld’s blog
http://robhirschfeld.com/
Implementing Crowbar in an OpenStack Environment

Tim Cook
Senior Virtualization Engineer, Hightail Inc.
My history in DevOps

2009-2011 Google
- Streamlined releases
- Implemented automation techniques using python

2012-2013 NASA Ames
- Implemented an automation tool utilizing Puppet
- Automated large scale HPC application and OS deployments
- Deployed OpenStack, and streamlined installation and scalability

2013 Hightail
- Leverage OpenStack in commercial cloud-based application company
- Testing and developing with the goal to release in production
Hightail (formerly YouSendIt)
Cloud based file sharing company

Go-to solution for businesses, big and small
- Over 40M users
- 98% of the fortune 500
- 190 countries

- Send
- Share
- Sync
- Sign
- Store
Deploying, automating & managing OpenStack with Crowbar

**NASA Ames**

- Cut OpenStack and application deployment post install, down to **ZERO**
- Eliminated manual setup and configuration of all operations-based applications including Nagios, Pxe services and Ganglia

**Hightail**

- Automate the build and scale out procedure to seamlessly deploy OpenStack clusters
- Rapidly deploy sandboxed environments based on engineering demand
Seamlessly deploying OpenStack clusters

Using Crowbar to build out our OpenStack clusters, including monitoring, DNS, graphing and complete OpenStack suite of tools:

1. Install crowbar iso
2. Check out cookbooks from git
3. Boot client servers
4. Drag and drop physical nodes to Barclamps (easily scripted as well)

This process can be achieved by junior level systems operators

5. Start using OpenStack instances

Using 16 blades for testing takes a maximum of 2 hours from start to finish
Pre-configured Chef cookbooks are stored in a git repo

- Cookbooks are checked out to enable easily replicable cluster deployments
- A single source of truth defines the OpenStack Cluster

Scaling the cluster requires minor interaction

- Repeat the initial install process, but only add the Nova Compute Barclamp to the newly discovered node
- You have scaled your cluster!
Meeting the demands of developers

Deployment of sandboxed environments

In an ideal world... many developers could write code and test it against a fully-replicated, production-simulated, sandboxed environment

This would require at minimum:

1. Expensive hardware purchases to replicate a scaled down version of a production environment
2. Operations resources for setting up configuring and maintaining the sandboxed environment

Providing this capability in the past has been a daunting task
Developers now can deploy their own sandbox, test their code and teardown their sandbox when complete.

Rapid deployment of sandboxed environments

- Once we were able to install our production environment from ground up via Chef, plugging the pieces in to replicate this process via scripts in OpenStack still required additional cycles.
- Developed application in 3 man-months to replicate our production environment from ground up on demand in OpenStack.
Dasein
Cloud
Overview

James Urquhart
Director of Product, Cloud Services Management, Dell
The goal:
Enable a Java programmer to
• write code once,
• compile it once,
• operate against many different clouds
• add new clouds post-deployment

Don’t compromise capabilities due to a Least Common Denominator approach to abstraction

What is it?
• An abstraction API that enables you to “write once, run against many clouds”
• Single model for cloud resources
• Unified set of operations for cloud functionality
• Common meta-data to describe differences
• Open Source sponsored by Dell
The **Challenge**

Every cloud has a different API and a different way of modeling similar problems

Example:

**AWS**
- EC2 “instance” provisioned from an “AMI”
- Query-based API

**OpenStack**
- “Server” provisioned from an “image”
- REST-based API
Dasein Solution

Provide a common model across all clouds
• “VirtualMachine” provisioned from a “MachineImage”

Use plug-in architecture to hide differences
• APIs, authentication, wire protocols, etc. between clouds

Build a superset of all IaaS capabilities
• <how do we do this?>

Today:
Java library

Future:
REST, PYTHON bindings, etc. as community creates support
**Dasein Cloud**

**Sample Use Case**

**Dell Multi-Cloud Manager**

- SaaS or On-Premises

**Deploy & manage enterprise applications across private, public & hybrid clouds**

**Dasein Cloud Open Source**

**On-Premise Private Clouds**

**Off-Premise Public Clouds**

**DMCM API**

- Existing Systems Management
  - LDAP/AD
  - Service Desks
  - SIEM Tool

- Configuration Management Tools
  - puppet
  - Chef
Dasein Cloud Abstraction Library
Write once, run against many clouds

An open source cloud API abstraction library to facilitate integration of cloud vendor services and platforms into your operations in a cloud-agnostic way

- Develop cloud operations, reporting and monitoring utilities and tools that are portable across multiple cloud environments
- Enable programmatic integration of your cloud services through a robust, open source, published API
- Distributed under Apache Software License 2.0

Project URL
http://dasein.org

Github
https://github.greese/dasein-cloud

Online developer channel
https://www.hipchat.com/gLjcZbGFl

Contribution information
https://github.com/greese/dasein-cloud/wiki

Forum and news:
https://groups.google.com/forum/#!forum/dasein-cloud
Visit us at booth #719

Annual OSCON Booth Crawl
Beer, Brownies and Pretzels” at the Dell Booth
Wednesday, 5:40–7:00PM

OpenStack 3rd Birthday Party
(pre-registration required!)
Wednesday 7:00–10:00PM
Sandbox Studio, 420 NE 9th Ave

Dell at the OpenStack Theater
Presentation at booth #716
Next Stop: End-to-End OpenStack
Thursday at 2:05pm

Add’l drawing for a
Sputnik Developer Laptop
Thursday 3:30 PM at the Dell booth
Wear your new Dell t-shirt!
Must be present to win!