OpenStack Orchestration with Heat

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Outline

- Heat
- Template Overview
- The Demo
- Q&A
Heat
What is Heat?

API + UI for orchestration on OpenStack.
Describe your cloud deployment in a declarative language.
Heat will process and build it and keep it up.
What can you do with it?

- Launch & provision instances with inter dependencies & parameters
- Attach block (cinder) or object (swift) storage
- Floating IPs
- Load balancing
- Autoscaling
- High availability (restart services, instances, the whole stack)
- Networking (quantum)
AWS CloudFormation

http://aws.amazon.com/cloudformation/

- Inspiration for Heat
- Our original API and template formats are compatible
- Heat can be controlled via boto
Relation with OpenStack

- Along with ceilometer the first external project accepted into incubation
- Using the same infrastructure (github, gerrit, launchpad, mailing lists, meetings)
- Follow the same coding style, architecture, packaging, etc.
Heat Templates
Structure

HeatTemplateFormatVersion: 2012-12-12
Description: This is an empty Heat template

Parameters:
  ...

Resources:
  ...

Outputs:
  ...
Resource example

MyApacheServer:
  Type: AWS::EC2::Instance
  Properties:
    ImageId: f17-jeos
    InstanceType: {Ref: MyFlavor}
    KeyName: {Ref: MyApacheSSHKey}
  Metadata:
    ...
  UserData: |
    #!/bin/bash
    /opt/aws/bin/cfn-init
    rm -rf /
    echo Trololo
Provisioning

List packages, services, files in the Metadata section.

Put custom code in the UserData section.

cfn-init installs packages, enables services & uploads files.
CloudWatch

Monitors the instances’ resources, can act on specified conditions:

- Start a new instance under high RAM/CPU utilization
- Spin down extra instances on low utilization
- Restart services/instances/the whole stack when it goes down
The Demo
Autoscaling

- A wordpress instance behind a load balancer
- Spin up a new instance when the RAM load > 50%
- Delete it when the load decreases
The Heat community

- about 5 core contributors
- about 12 other contributors over time (7 outside of Red Hat)
  - testing, feature requests, bug reporting; little code
- Ceilometer collaboration
Wrap Up

- http://heat-api.org/
- https://github.com/openstack/heat
- #heat on freenode (we're there pretty much 24/7)