Open Source tools for distributed systems administration

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- Long time contributor to various open source projects
- Co-author of The Official Ubuntu Book, 8th ed

Topics

1. Our team
2. The OpenStack CI system
3. Code Review
4. Automated testing
5. Other collaboration tools
6. Communication

How most open source projects do infrastructure

- Team (or company) manages it ...or they just use code hosting
- Requests are submitted via mailing list, bug report or ticketing system
- Request priority is determined by the core team

This may be similar to your organization.

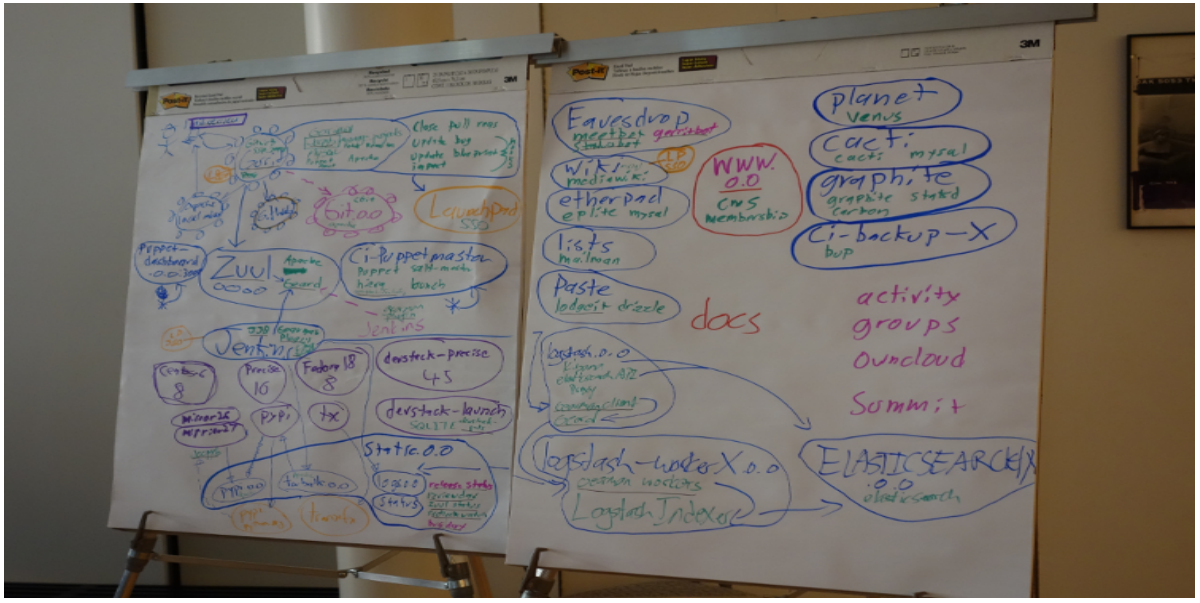
Is there a better way?

OpenStack Infrastructure Team

- Our job is to make sure the OpenStack developers can do *their* job
- All of our system configurations are open source and tracked in git: https://git.openstack.org/cgit/openstack-infra
- Anyone in the world can propose patches for direct inclusion in our infrastructure, instructions at: http://docs.openstack.org/infra/manual/developers.html
- We all work remotely. Worldwide: US, Russia, Australia, Spain.

What we run

- Askbot
- Continuous Integration systems
- Cacti
- Elasticsearch, Logstash and Kibana
- IRC Bots
- Etherpad
- Git
- Paste
- Planet
- Puppetboard
- Mailing Lists
- Translations platform
- Various web services
- Wiki



OpenStack Continuous Integration (CI) System

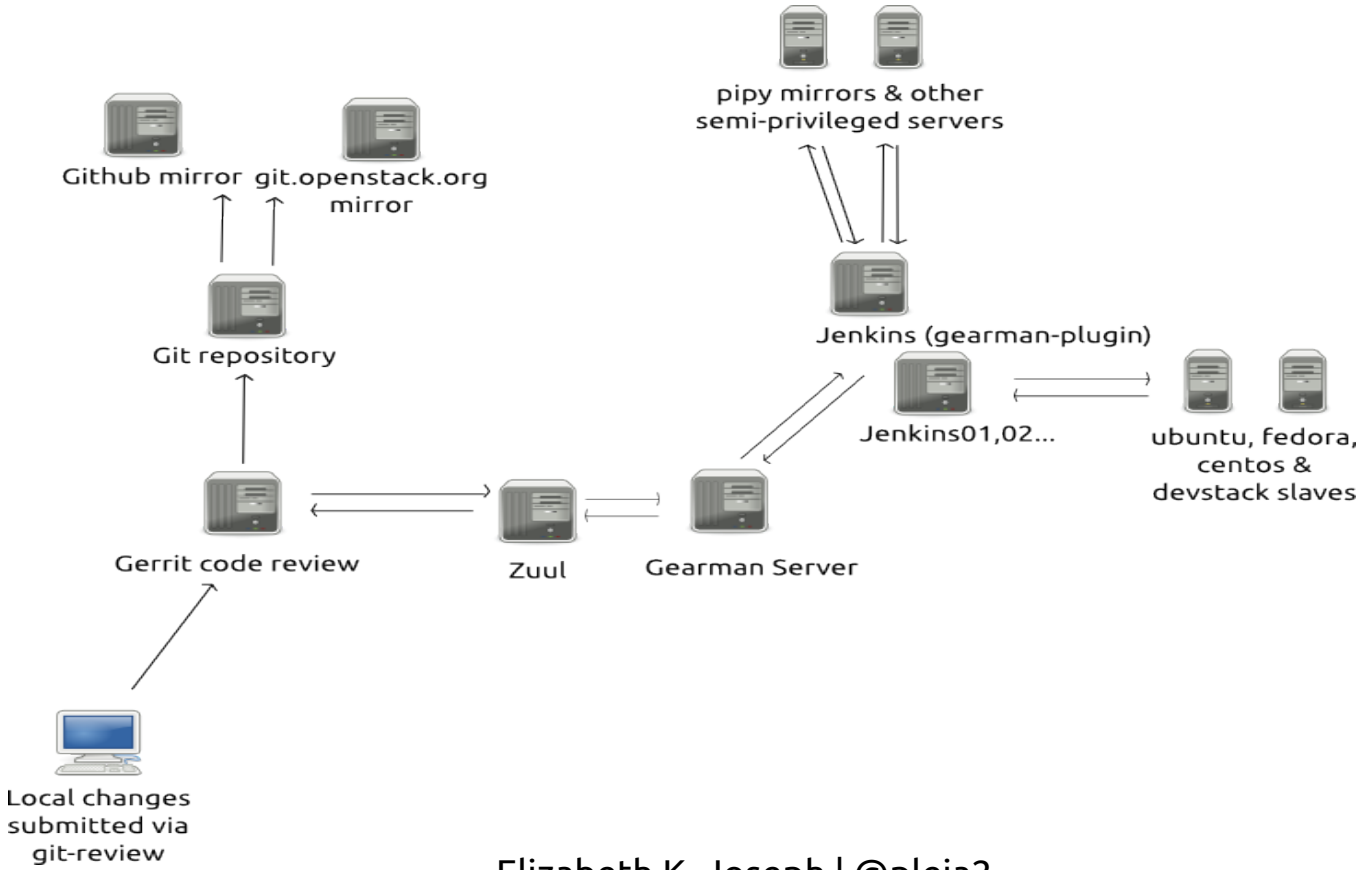
- Lots of individual projects (800+)
- All projects must work together
- Changes can't break master branch
- Code should be syntactically clean
- Testing must be completed automated

Tools we're using for CI

- Launchpad (someday: openstackid)
- Git
- Gerrit
- Zuul*
- Gearman
- Jenkins (with jenkins-job-builder*, devstack-gate*)
- Nodepool*

* Started by the OpenStack Infrastructure team

Workflow


pipy mirrors & other
semi-privileged servers
Github mirror
git.openstack.org
mirror
Git repository
Jenkins (gearman-plugin)
Jenkins01,02...
ubuntu, fedora,
centos &
devstack slaves
Gerrit code review
Zuul
Gearman Server
Local changes
submitted via
git-review

Why do I care?

The Infrastructure team uses it too!

Automated tests for infrastructure

- flake8 (pep 8 and pyflakes)
- puppet parser validate
- puppet lint
- Puppet application tests
- XML checkers
- Alphabetized files
- IRC channel permissions

Peer review means...

- Multiple eyes on changes prior to merging
- Good infrastructure for developing new solutions
- No special process to go through for commit access
- Trains us to be collaborative by default
- Since anyone can contribute, anyone can devote resources to it

Gerrit in-line comments

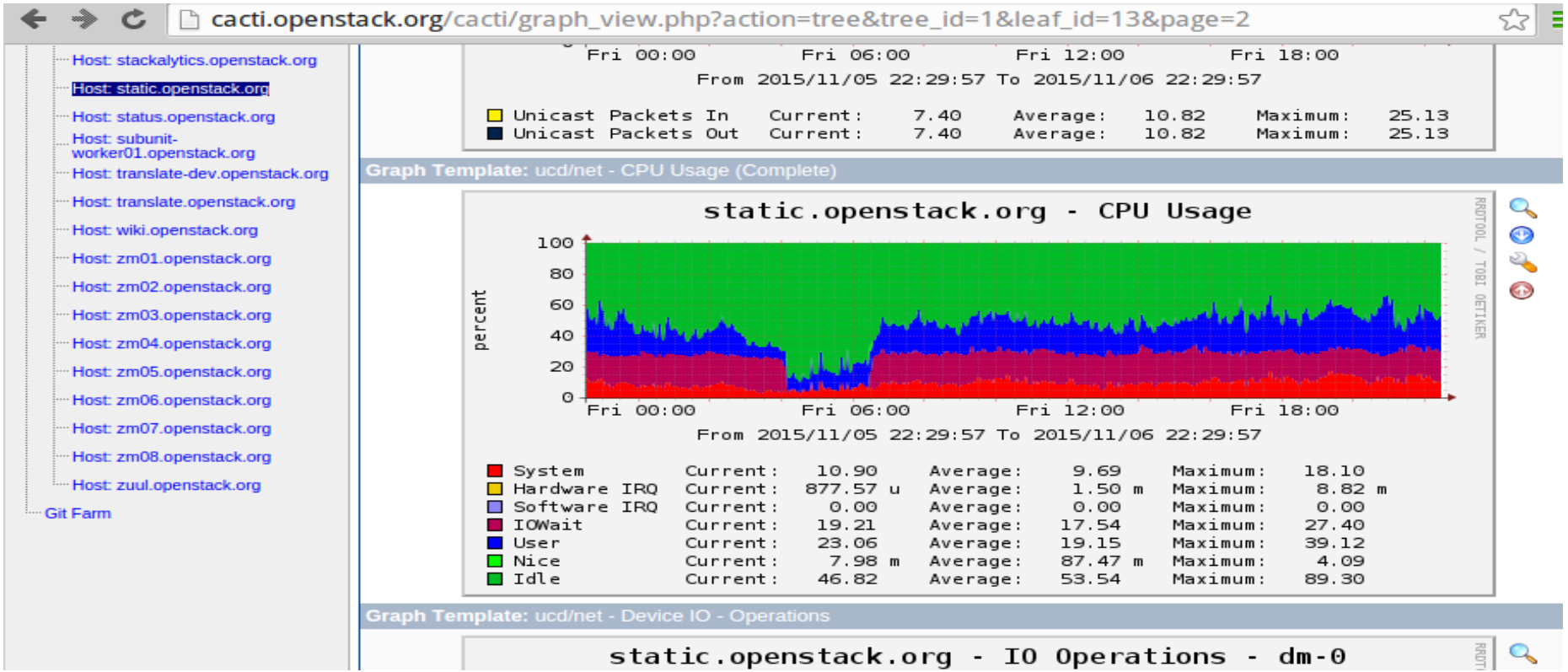
Automated deployment

- Change gets approved, tested and merged
- ...Either puppet master gets updated and applies change
- ...Or vcsrepo module in puppet pulls in latest version of project

Can you really manage an infrastructure via git commits?

Cacti (http://cacti.openstack.org/) to keep an eye on server usage

Cacti


cacti.openstack.org/cacti/graph_view.php?action=tree&tree_id=1&leaf_id=13&page=2
Host: stackalytics.openstack.org
Host: static.openstack.org
Host: status.openstack.org
Host: subunit-worker01.openstack.org
Host: translate-dev.openstack.org
Host: translate.openstack.org
Host: wiki.openstack.org
Host: zm01.openstack.org
Host: zm02.openstack.org
Host: zm03.openstack.org
Host: zm04.openstack.org
Host: zm05.openstack.org
Host: zm06.openstack.org
Host: zm07.openstack.org
Host: zm08.openstack.org
Host: zuul.openstack.org
Git Farm
Fri 00:00 Fri 06:00 Fri 12:00 Fri 18:00
From 2015/11/05 22:29:57 To 2015/11/06 22:29:57
Unicast Packets In Current: 7.40 Average: 10.82 Maximum: 25.13
Unicast Packets Out Current: 7.40 Average: 10.82 Maximum: 25.13
Graph Template: ucd/net - CPU Usage (Complete)
static.openstack.org - CPU Usage
percent
100
80
60
40
20
0
Fri 00:00 Fri 06:00 Fri 12:00 Fri 18:00
From 2015/11/05 22:29:57 To 2015/11/06 22:29:57
System Current: 10.90 Average: 9.69 Maximum: 18.10
Hardware IRQ Current: 877.57 u Average: 1.50 m Maximum: 8.82 m
Software IRQ Current: 0.00 Average: 0.00 Maximum: 0.00
IOWait Current: 19.21 Average: 17.54 Maximum: 27.40
User Current: 23.06 Average: 19.15 Maximum: 39.12
Nice Current: 7.98 m Average: 87.47 m Maximum: 4.09
Idle Current: 46.82 Average: 53.54 Maximum: 89.30
Graph Template: ucd/net - Device IO - Operations
static.openstack.org - IO Operations - dm-0

Can you really manage an infrastructure via git commits? (2/3)

PuppetBoard (http://puppetboard.openstack.org/) so you can watch your changes get applied, or not

PuppetBoard

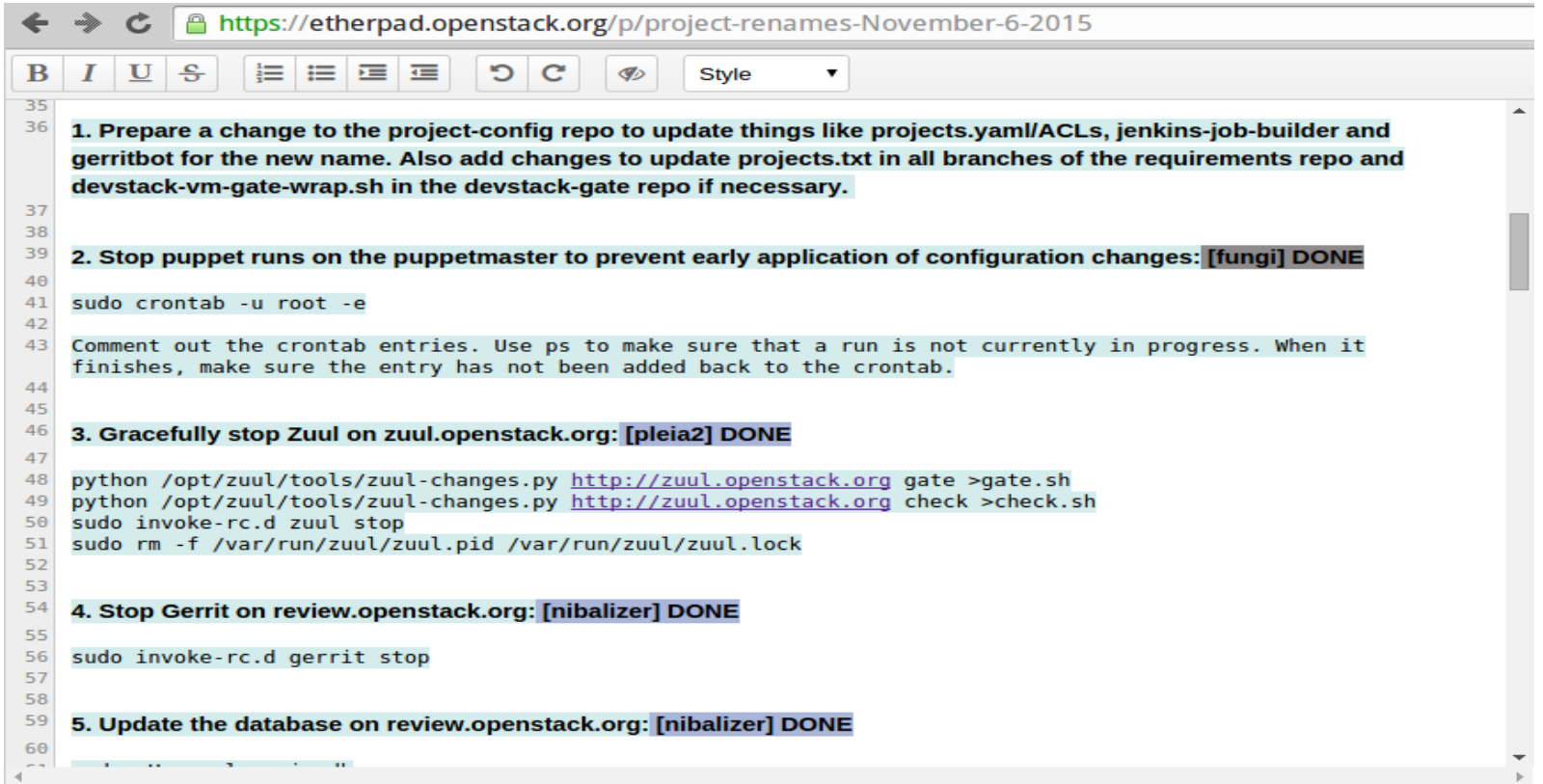
Can you really manage an infrastructure via git commits? (3/3)

Thorough, specific documentation at
http://docs.openstack.org/infra/system-config

Well, not everything

- Automation is not perfect, sometimes you just need to log into a server
- Complicated migrations and upgrades need manual components (but we automate more every time!)
- Initial persistent server deployment still has manual components
- Passwords need to be privately managed (but we use git!)

Maintenance collaboration on Etherpad



Human collaboration

- Main IRC channel (#openstack-infra)
- Incident IRC channel (#openstack-infra-incident)
- Sprint IRC channel (#openstack-sprint)
- Weekly IRC-based meetings (#openstack-meeting)
- Channel/Meeting logs on http://eavesdrop.openstack.org/
- Pastebin http://paste.openstack.org/
- In person collaboration at the OpenStack Design Summit every 6 months

No voice or video calls.

And then there are time zones :(

- Increased coverage is great, but...
  - The first core/root member in a particular region struggles to feel cohesion with the team
  - Increased reluctance to land changes into production
  - Makes for slower on-boarding for key tasks
- Only solved by increasing coverage in that time zone so they're not alone

But mostly it's pretty great!

(and our team always needs help)

Questions

My *real* email ;) lyz@princessleia.com

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Freenode: pleia2

OpenStack CI Resources:
http://docs.openstack.org/infra/system-config/