

# Code Review for DevOps

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# Elizabeth K. Joseph

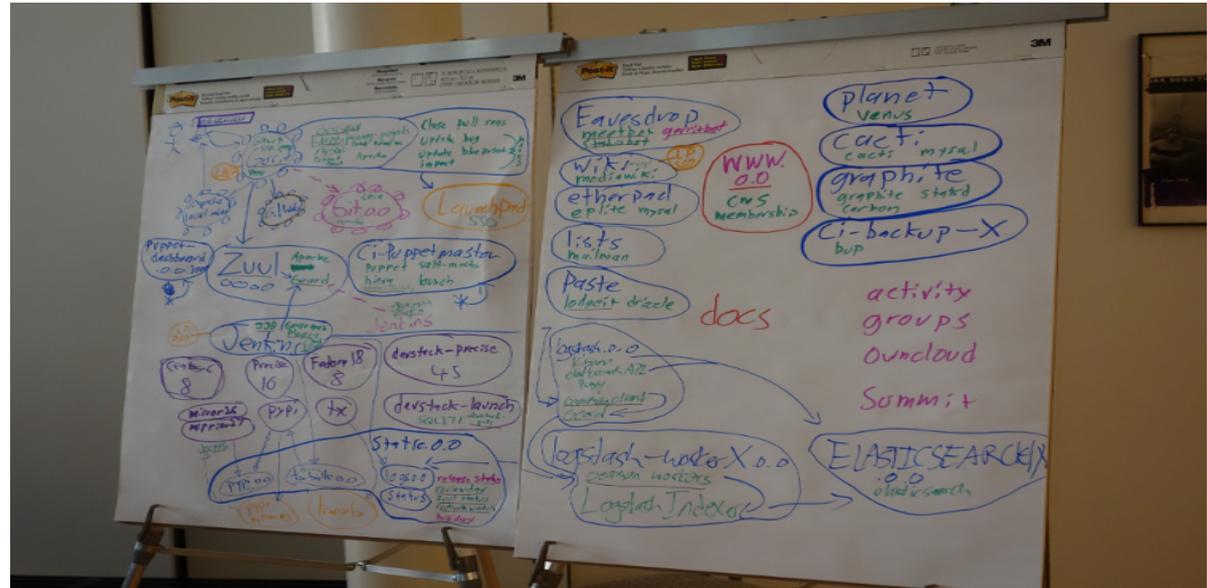
- OpenStack Infrastructure Team DevOps Engineer, paid by Hewlett Packard Enterprise
- Long time contributor to various open source projects
- Co-author of The Official Ubuntu Book, 8<sup>th</sup> ed

# 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.

# We run services for developers

- 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 (1000+)
- All projects must work together
- Changes can't break master branch
- Code should be syntactically clean
- Testing must be completed automated

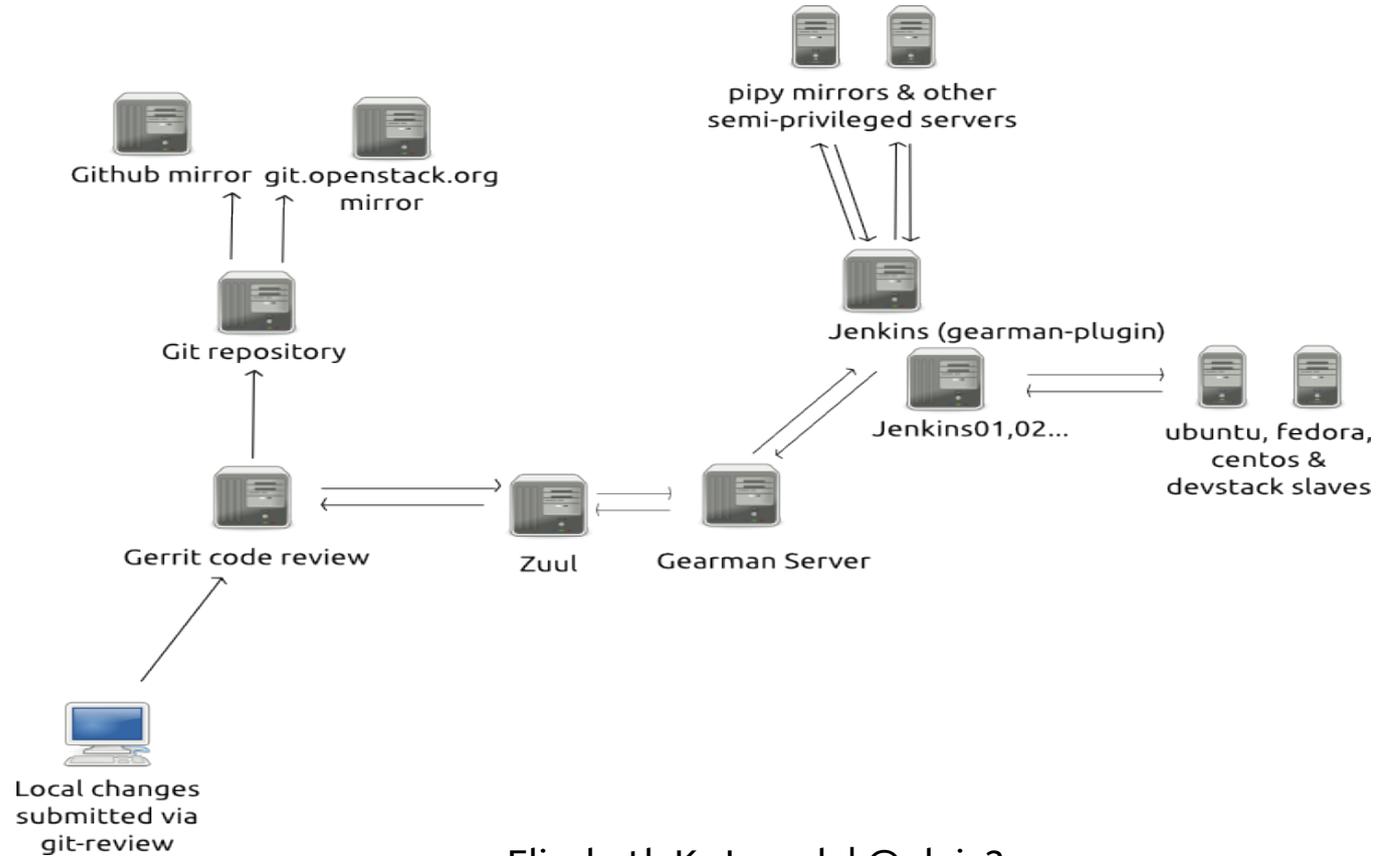
# Tools we're using for CI

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

\* Started by the OpenStack Infrastructure team

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# Workflow



# Why do I care?

The Infrastructure team uses it too!

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# 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

- 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
- Anyone can contribute, anyone can devote resources to it

# Gerrit 1/2

The screenshot shows a web browser window displaying a Gerrit code review page. The browser's address bar shows the URL <https://review.openstack.org/#/c/288745/>. The page header includes the OpenStack logo and navigation links for 'All', 'My', 'Projects', 'People', 'Plugins', and 'Documentation'. A search bar and the user name 'Elizabeth K. Joseph' are also visible.

The main content area shows a change titled 'Change 288745 - Merged' with the subject 'Customize cggit max-repo-count and set it to 1500'. The change description explains that the 'max-repo-count' setting in the 'cggitrc' file is being adjusted from 600 to 1500 to handle a large number of repositories. The change ID is 'I7a2ea185f0876806ecfd17bedd84dbcd9769b124'.

On the right side, there is a metadata panel showing the owner 'Elizabeth K. Joseph', reviewers 'Colleen Murphy', 'Craig McWhirter', 'James E. Blair', 'Jenkins', and 'Ricardo Carrillo Cruz', and the project 'openstack-infra/system-config'. Below this, there are 'Cherry Pick' and 'Revert' buttons.

At the bottom right, there is a 'Code-Review' section showing '+2' from 'James E. Blair' and 'yolanda.robila', '+1' from 'Colleen Murphy', 'Craig McWhirter', and 'Ricardo Carrillo Cruz', '+2' from 'Jenkins', and '+1' from 'James E. Blair'. Below this, there is a 'Jenkins check' section showing successful builds for 'gate-infra-puppet-apply-bare-precise', 'gate-infra-puppet-apply-bare-trusty', and 'gate-infra-puppet-apply-dsvm-centos7'.

Author	Elizabeth K. Joseph <lyz@princessleia.com>	Mar 4, 2016 1:12 PM
Committer	Elizabeth K. Joseph <lyz@princessleia.com>	Mar 4, 2016 1:12 PM
Commit	359b7d48b98a91d3f47bd718a3858be5b0bc27c4	<a href="#">(gitweb)</a>
Parent(s)	93ab8feca646ddd1036408a88ee1ea124704e119	<a href="#">(gitweb)</a>
Change-Id	I7a2ea185f0876806ecfd17bedd84dbcd9769b124	

<https://review.openstack.org/#/c/288745/>

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# Gerrit 2/2

The screenshot shows the Gerrit Code Review interface for a change set. The browser address bar indicates the URL `https://review.openstack.org/#/c/288745/`. The top section displays a list of build jobs, all of which have completed successfully. Below this, the 'Files' section shows the file `modules/openstack_project/manifests/git_backend.pp` with 13 lines of code added and 6 lines removed. The 'History' section provides a chronological list of actions performed on the change set, including uploads, code reviews, and merges.

Job Name	Status	Duration
gate-infra-puppet-apply-bare-trusty	SUCCESS	in 4m 30s
gate-infra-puppet-apply-dsvm-centos7	SUCCESS	in 2m 20s
gate-infra-puppet-apply-fedora-23	SUCCESS	in 2m 59s
gate-openstackci-beaker-centos7-dsvm	SUCCESS	in 11m 18s
gate-openstackci-beaker-trusty-dsvm	SUCCESS	in 3m 49s
gate-system-config-docs	SUCCESS	in 1m 31s
gate-system-config-linters	SUCCESS	in 1m 46s
gate-system-config-puppet-syntax	SUCCESS	in 1m 12s

File Path	Comments	Size
<input type="checkbox"/> Commit Message		
<input checked="" type="checkbox"/> modules/openstack_project/manifests/git_backend.pp	13	
	+7, -6	

Author	Action	Timestamp
Elizabeth K. Joseph	Uploaded patch set 1.	Mar 4 1:16 PM
Jenkins	Patch Set 1: Verified+1 Build succeeded (check pipeline). - gate-infra-puppet-apply-bare-precise http://logs.openstack.org/45/288745/1/check/gate-infra...	Mar 4 3:08 PM
Craige McWhirter	Patch Set 1: Code-Review+1 \o/	Mar 6 3:13 PM
yolanda.robla	Patch Set 1: Code-Review+2	Mar 7 5:27 AM
Ricardo ...llo Cruz	Patch Set 1: Code-Review+1	Mar 7 9:19 AM
Colleen Murphy	Patch Set 1: Code-Review+1	Mar 9 5:18 PM
James E. Blair	Patch Set 1: Workflow+1 Code-Review+2	Mar 10 8:24 AM
Jenkins	Patch Set 1: -Verified Starting gate jobs. http://status.openstack.org/zuul/	Mar 10 8:24 AM
Jenkins	Patch Set 1: Verified+2 Build succeeded (gate pipeline). - gate-infra-puppet-apply-bare-precise http://logs.openstack.org/45/288745/1/gate/gate-infra-p...	Mar 10 9:04 AM
Gerrit Code Review	Change has been successfully merged into the git repository by Jenkins	Mar 10 9:04 AM

Powered by Gerrit Code Review (2.11.4-11-ga14450f) | Get Help | Press '?' to view keyboard shortcuts

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# Gerrit in-line comments

19 20	}	}	20 21
... skipped 25 common lines ...			
46 47 48 49	content => template('lodgeit/manage.py.erb'), notify => Service["\${name}-paste"], }	content => template('lodgeit/manage.py.erb'), notify => Service["\${name}-paste"], }	47 48 49 50
50 51 52 53 54 55	file { "/srv/lodgeit/\${name}/lodgeit/views/layout.html": ensure => present, replace => true, content => template('lodgeit/layout.html.erb'), }	file { "/srv/lodgeit/\${name}/lodgeit/views/layout.html": ensure => present, replace => true, content => template('lodgeit/layout.html.erb'), }	51 52 53 54 55 56
		if \$robotstxt != undef {	57
		<b>Spencer Krum</b> <span style="float: right;">Sep 21 4:32 PM</span> Probably just want if \$robotstxt here. <input type="button" value="Reply ..."/> <input type="button" value="Reply 'Done'"/>	
		file { "/srv/lodgeit/\${name}/robots.txt": ensure => present, owner => 'root', group => 'root', mode => '0444', source => 'puppet:///modules/lodgeit/robots.txt', require => File["/srv/lodgeit/\${name}/"], }	58 59 60 61 62 63 64 65 66
56 57 58 59 60	cron { "update_backup_\${name}": ensure => absent, user => root, }	cron { "update_backup_\${name}": ensure => absent, user => root, }	67 68 69 70 71

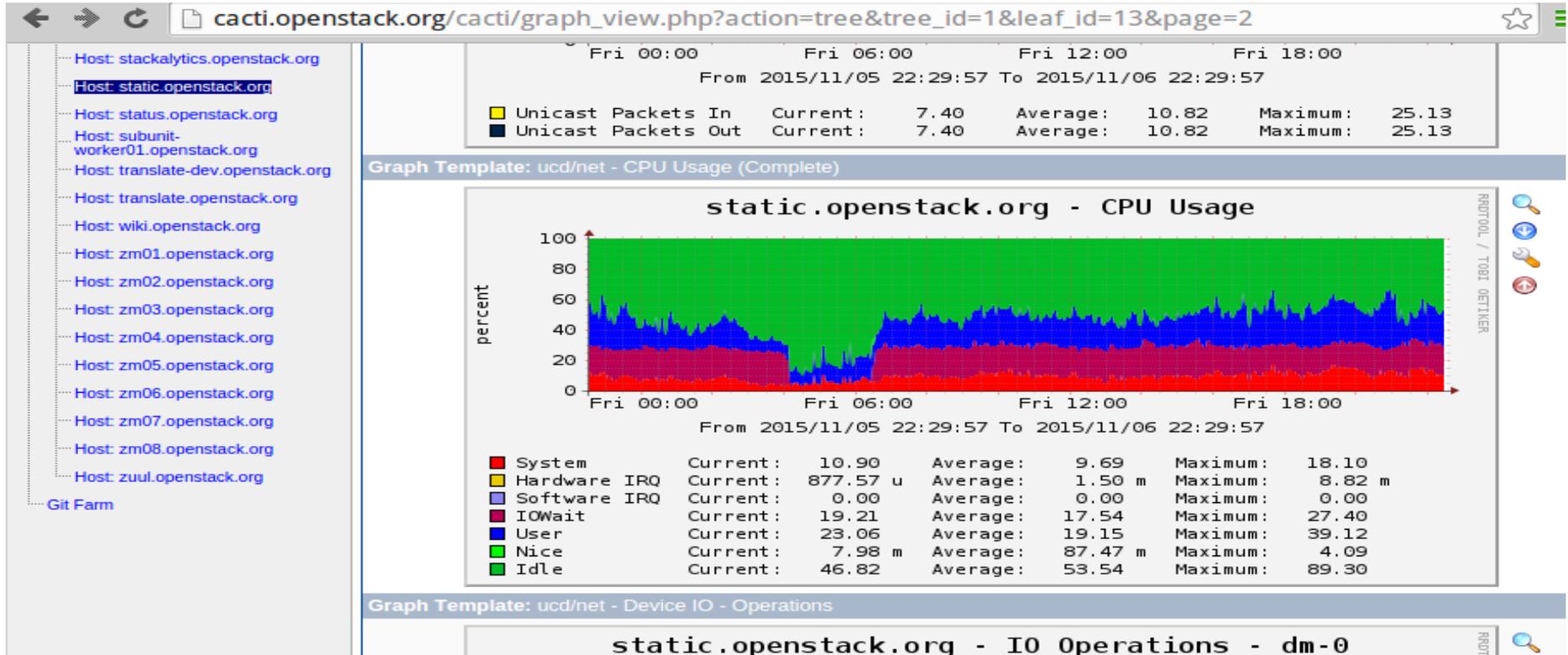
# Automated deployment

- Change gets approved, tested and merged
- ...Either puppet master gets updated and applies change
- ...Or continuously deploy via the 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

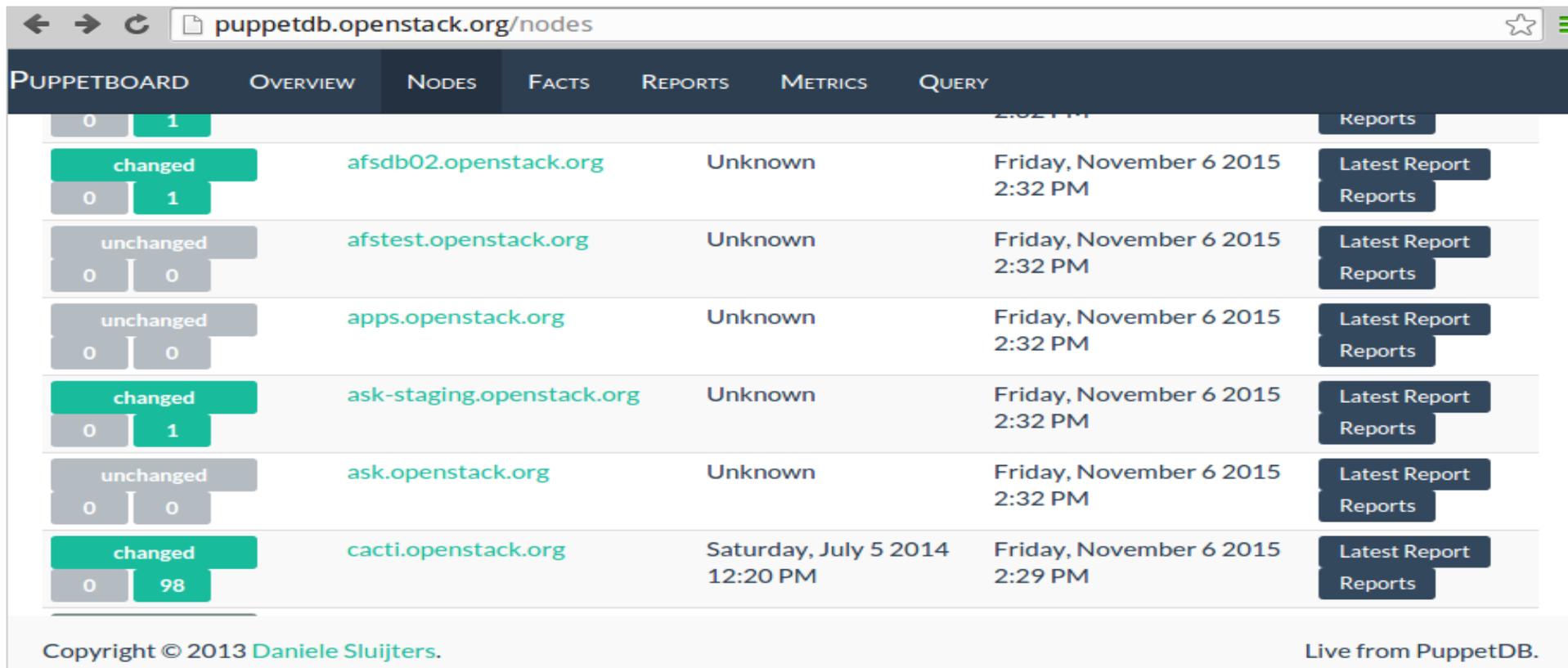
# Cacti



# 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



The screenshot shows the PuppetBoard web interface. The browser address bar displays `puppetdb.openstack.org/nodes`. The navigation menu includes **PUPPETBOARD**, **OVERVIEW**, **NODES** (selected), **FACTS**, **REPORTS**, **METRICS**, and **QUERY**. The main content area displays a table of nodes with the following columns: a status bar (0/1 or 0/0), node name, status, last report time, and a **Latest Report Reports** button.

Status	Node Name	Status	Last Report Time	Action
0 / 1				Reports
changed 0 / 1	<a href="#">afbdb02.openstack.org</a>	Unknown	Friday, November 6 2015 2:32 PM	Latest Report Reports
unchanged 0 / 0	<a href="#">afstest.openstack.org</a>	Unknown	Friday, November 6 2015 2:32 PM	Latest Report Reports
unchanged 0 / 0	<a href="#">apps.openstack.org</a>	Unknown	Friday, November 6 2015 2:32 PM	Latest Report Reports
changed 0 / 1	<a href="#">ask-staging.openstack.org</a>	Unknown	Friday, November 6 2015 2:32 PM	Latest Report Reports
unchanged 0 / 0	<a href="#">ask.openstack.org</a>	Unknown	Friday, November 6 2015 2:32 PM	Latest Report Reports
changed 0 / 98	<a href="#">cacti.openstack.org</a>	Saturday, July 5 2014 12:20 PM	Friday, November 6 2015 2:29 PM	Latest Report Reports

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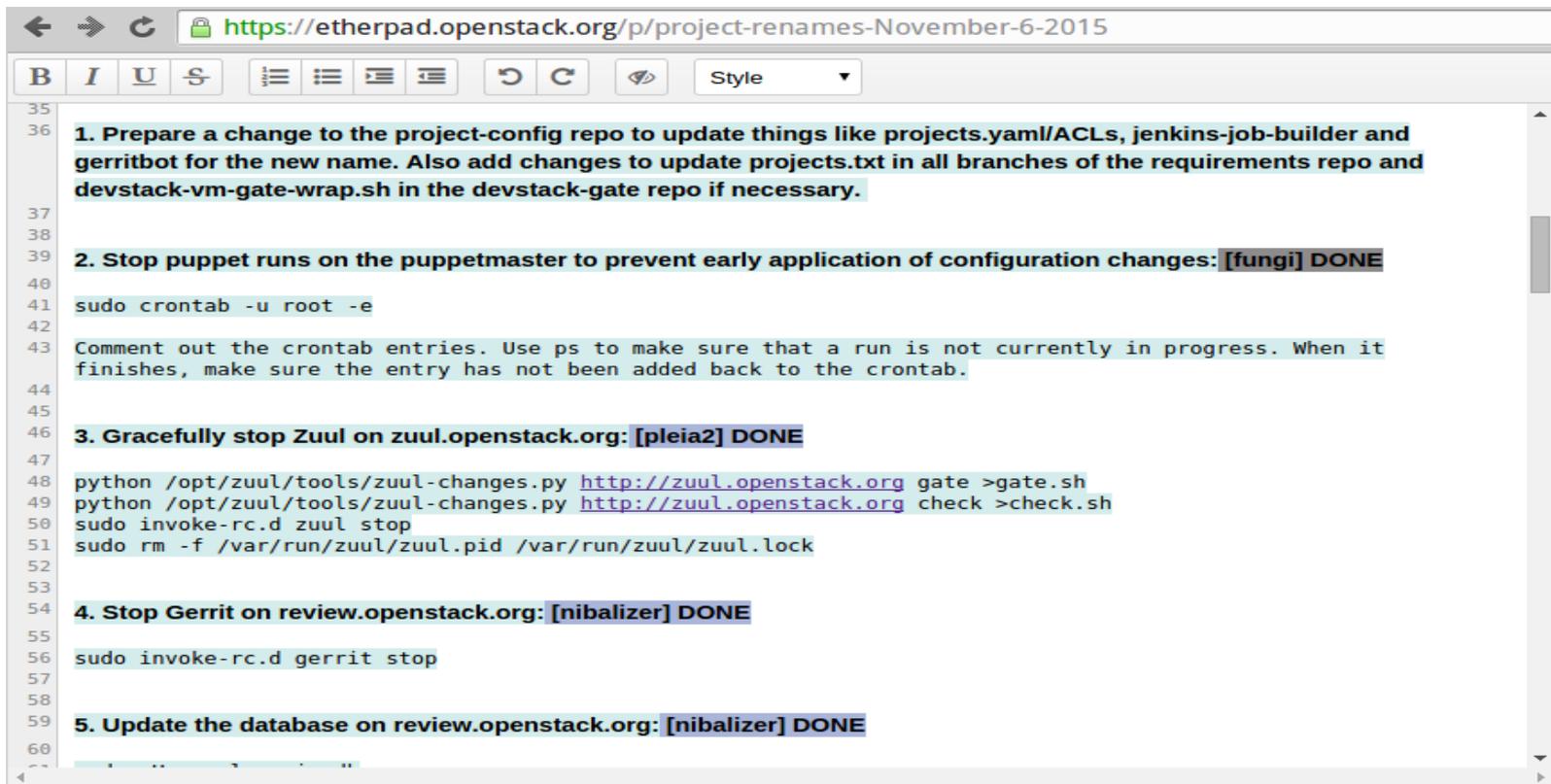
# Can you really manage an infrastructure via git commits? (3/3)

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



The screenshot shows a web browser window with the URL `https://etherpad.openstack.org/p/project-renames-November-6-2015`. The document content is as follows:

```
35
36 1. Prepare a change to the project-config repo to update things like projects.yaml/ACLs, jenkins-job-builder and gerritbot for the new name. Also add changes to update projects.txt in all branches of the requirements repo and devstack-vm-gate-wrap.sh in the devstack-gate repo if necessary.
37
38
39 2. Stop puppet runs on the puppetmaster to prevent early application of configuration changes: [fungi] DONE
40
41 sudo crontab -u root -e
42
43 Comment out the crontab entries. Use ps to make sure that a run is not currently in progress. When it finishes, make sure the entry has not been added back to the crontab.
44
45
46 3. Gracefully stop Zuul on zuul.openstack.org: [pleia2] DONE
47
48 python /opt/zuul/tools/zuul-changes.py http://zuul.openstack.org gate >gate.sh
49 python /opt/zuul/tools/zuul-changes.py http://zuul.openstack.org check >check.sh
50 sudo invoke-rc.d zuul stop
51 sudo rm -f /var/run/zuul/zuul.pid /var/run/zuul/zuul.lock
52
53
54 4. Stop Gerrit on review.openstack.org: [nibalizer] DONE
55
56 sudo invoke-rc.d gerrit stop
57
58
59 5. Update the database on review.openstack.org: [nibalizer] DONE
60
```

# 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

The email address I use: [lyz@princessleia.com](mailto:lyz@princessleia.com)

HPE email: [lyz@hpe.com](mailto:lyz@hpe.com)

Freenode: pleia2

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