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, 8th 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

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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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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

• 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

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

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## Gerrit 2/2

<table>
<thead>
<tr>
<th>Review URL</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><a href="https://review.openstack.org/">https://review.openstack.org/</a></td>
<td>Customize cgit max-repo-count and set it to 1500</td>
</tr>
</tbody>
</table>

**Commit Message**
- modules/openstack_project/manifests/git_backend.pp

**Comments Size**
- 13
- +7, -6

**History**
- **Elizabeth K. Joseph**: Uploaded patch set 1. Mar 4 1:16 PM
- **Craig McWhirter**: Patch Set 1: Code-Review+1. Mar 6 2:13 PM
- **Ricardo ...lo 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
- **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-ga144505) | Get Help | Press ? to view keyboard shortcuts
Gerrit in-line comments
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/](http://cacti.openstack.org/)) to keep an eye on server usage
Cacti

static.openstack.org - CPU Usage

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

<table>
<thead>
<tr>
<th>PuppetBoard</th>
<th>Overview</th>
<th>Nodes</th>
<th>Facts</th>
<th>Reports</th>
<th>Metrics</th>
<th>Query</th>
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<tbody>
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<td>Reports</td>
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<td>Latest Report</td>
<td>Reports</td>
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<tr>
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<td>Latest Report</td>
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<td>unchanged</td>
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<td>ask.openstack.org</td>
<td>Unknown</td>
<td>Friday, November 6 2015 2:32 PM</td>
<td>Latest Report</td>
<td>Reports</td>
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<td>Latest Report</td>
<td>Reports</td>
</tr>
</tbody>
</table>

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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!)
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.

2. Stop puppet runs on the puppetmaster to prevent early application of configuration changes:
   ```
sudo crontab -u root -e
   ``
   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;

3. Gracefully stop Zuul on zuul.openstack.org:
   ```
   python /opt/zuul/tools/zuul.changes.py http://zuul.openstack.org gate > gate.sh
   python /opt/zuul/tools/zuul.changes.py http://zuul.openstack.org check > check.sh
   sudo invoke-rc.d zuul stop
   sudo rm -f /var/run/zuul/zuul.pid /var/run/zuul/zuul.lock
   ```

4. Stop Gerrit on review.openstack.org:
   ```
   sudo invoke-rc.d gerrit stop
   ```

5. Update the database on review.openstack.org:
   ```
   sudo invoke-rc.d gerrit stop
   ```

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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

HPE email: lyz@hpe.com

Freenode: pleia2

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