OpenStack CI in Numbers

- ~1800 contributors to Pike
- 6 Clouds + 2 run by OpenStack Infra
- 1600+ repos in openstack(|-dev|-infra)
- 20k lines Zuul configuration

Source: Zuul, Graphite
OpenStack CI in Numbers

Number of Tests run Daily

Source: subunit2sql-graph dailycount
"Develop, maintain, and initiate tools and plans to ensure the upstream stability and quality of OpenStack, and its release readiness at any point during the release cycle."
Testing OpenStack

- One commit at the time
- Release ready master
- Check & Gate Pipelines
- Ephemeral test system

Source: http://status.openstack.org/zuul
Beyond the gate

- Periodic tests
- Release jobs

Source: status.openstack.org/openstack-health/
The unbalanced scale

- Core reviewers
- Horizontal teams
- Running CI

- Commits
- # of Tests
- # of Configurations

Not the scale I meant...
Life as a contributor

Average gate jobs per project

Source: subunit2sql DB

Average number of patchset (last 1000 changes)

Source: Gerrit API
Life as a contributor

- Worst case
- Recheck

Max gate jobs per project

Source: subunit2sql DB
# My day in reviews

<table>
<thead>
<tr>
<th>Project</th>
<th>Unreviewed</th>
<th>Open</th>
</tr>
</thead>
<tbody>
<tr>
<td>[[ QA ]]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>openstack-dev/devstack</td>
<td>176</td>
<td>176</td>
</tr>
<tr>
<td>openstack-dev/grenade</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>openstack-dev/hacking</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>openstack/eslint-config-openstack</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>openstack/karma-subunit-reporter</td>
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<tr>
<td>openstack/os-performance-tools</td>
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<tr>
<td>openstack/os-testr</td>
<td>6</td>
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<td>openstack/patrole</td>
<td>19</td>
<td>21</td>
</tr>
<tr>
<td><strong>openstack/tempest</strong></td>
<td><strong>272</strong></td>
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</tr>
<tr>
<td>openstack/tempest-lib</td>
<td>9</td>
<td>9</td>
</tr>
<tr>
<td>[[ Test Results ]]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>[[ Plugins ]]</td>
<td>53</td>
<td>53</td>
</tr>
<tr>
<td>[[ Infra ]]</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>[[ Specs ]]</td>
<td>192</td>
<td>192</td>
</tr>
<tr>
<td>[[ Governance &amp; Co. ]]</td>
<td>165</td>
<td>165</td>
</tr>
<tr>
<td>[[ Oslo ]]</td>
<td>23</td>
<td>23</td>
</tr>
</tbody>
</table>

Source: gerty
My day in reviews

- Change in devstack:

```
536   +   if [ -z "$VRIT_DRIVER" ]; then
537   +     # If there is not virt driver defined we assume nova is not installed
538   +     iniset $TEMPEST_CONFIG service_available nova "False"
539   +   fi
540   +
```

Source: https://review.openstack.org/468060

- CI reports all green
- Can you see the error?
Keep the gate flowing

- Beginning of Pike:
- Number of services
- Service memory footprint
- Test load
- Libvirt instability under load
- Tempest bug in ssh test code
- Vanilla database configuration

Test failure rate over 5 months (1 day rolling average)

Source: Zuul, Graphite
Data!

- 50MB compressed logs for integration test run
  - node setup
  - system, service and test log files
  - system, service and test configuration
  - system metrics (dstat data)
  - libvirt logs
- Test result data (Zuul & subunit)
- Gerrit event streams
Single run view

- Deeplink into logs
- HTML view of tests
- Stackviz
- Ansible Run Analysis (ARA)

Source: Stackviz
Runtime variance

Source: subunit2sql-graph run_time
Deeper into data

- Logstash: logstash.openstack.org
- Elastic Recheck: http://status.openstack.org/elastic-recheck/
- E-R Queries: git.openstack.org/openstack-infra/elastic-recheck/queries
Deeper into data

- subunit2sql mysql://logstash.openstack.org/subunit2sql
- subunit2sql-graph
- OpenStack-Health API health.openstack.org/
- OpenStack Health http://status.openstack.org/openstack-health/
Other Data Sources and Views

- Graphite: http://graphite.openstack.org
- Grafana: http://grafana.openstack.org
- Firehose: https://docs.openstack.org/infra/system-config/firehose.html
What’s next?

- Metrics over time from OS, MySQL, RabbitMQ, etc
- CRM114
- Artificial intelligence
Playing with Machine Learning

- Long Short Term Memory network, RNN
- Trained with nova logs from periodic test runs
- DEMO
AI to the rescue

- Make anomalous log lines emerge
- Help identify new elastick recheck signatures
- Catch changes in behaviour that we do not test for
- Help review process
References

- https://docs.openstack.org/developer/subunit2sql/graph.html
- https://github.com/sherjilozair/char-rnn-tensorflow
- https://docs.openstack.org/infra/system-config/logstash.html#crm114
- https://github.com/andreafrittoli/testing_at_scale/

- IRC: #openstack-qa
- email: openstack-dev@lists.openstack.org, tag [QA]
Thank you!

Questions?