Testing at Scale

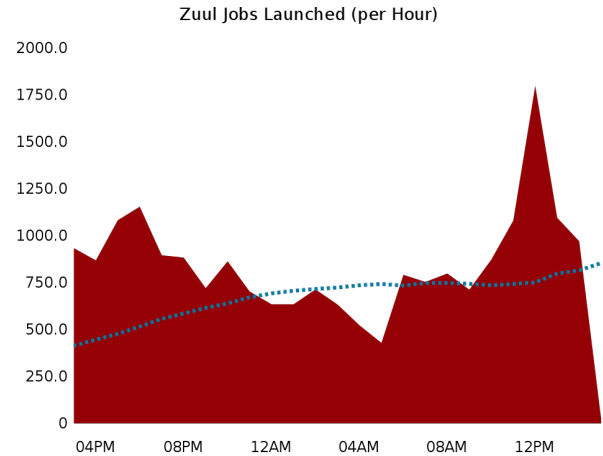
Andrea Frittoli
andrea.frittoli@gmail.com
andreaf on Freenode
@blackchip76 on Twitter

Jun 2, 2017

https://github.com/andreafrittoli/testing_at_scale

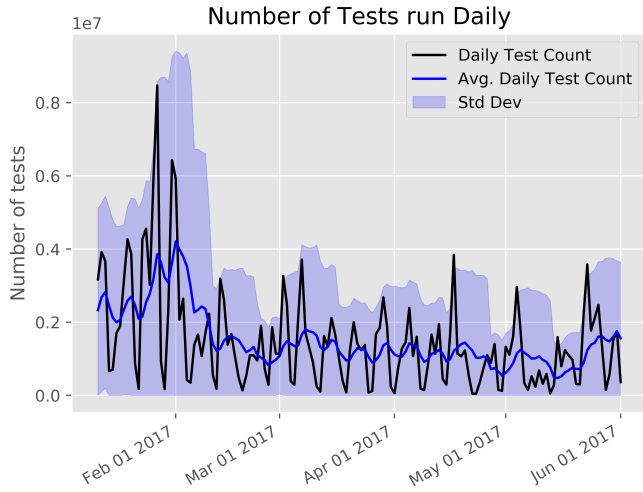
OpenStack CI in Numbers

- ∼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

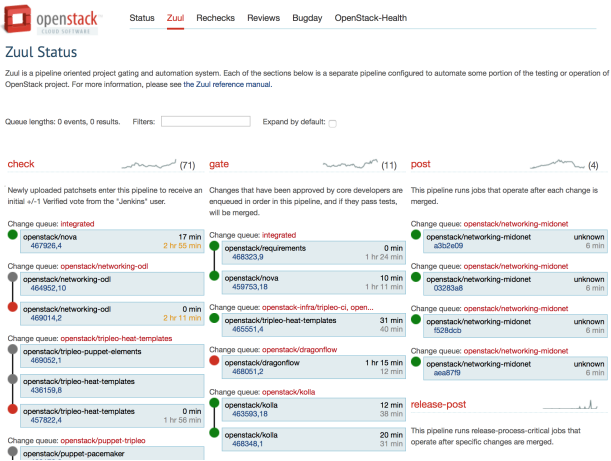


Source: subunit2sql-graph dailycount

OpenStack QA Mission Statement

"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

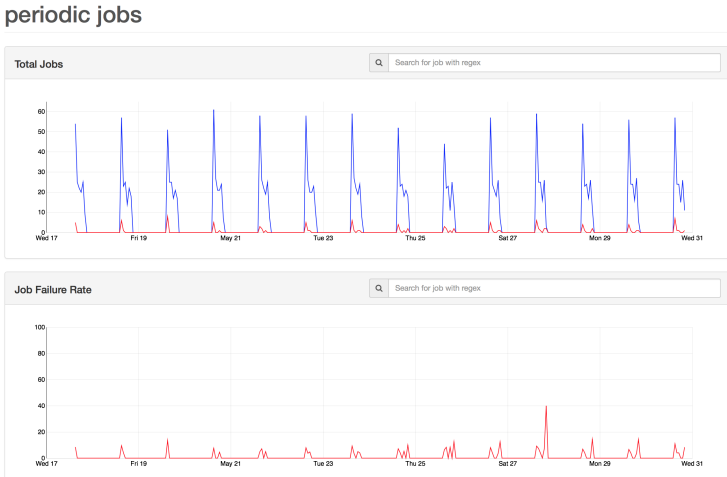


Source: http://status.openstack.org/zuul

- Release ready master
- Check & Gate Pipelines
- Ephemeral test system

Beyond the gate

- Periodic tests
- Release jobs



Reference: status.openstack.org/openstack-health/

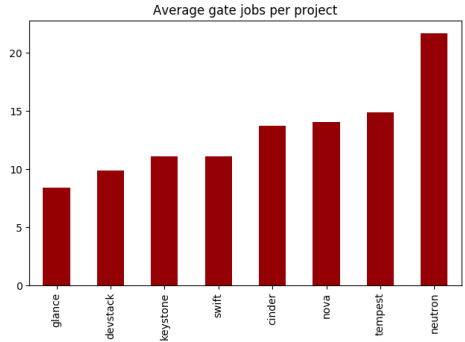
The unbalanced scale

- Core reviewers
- Horizontal teams
- Running CI

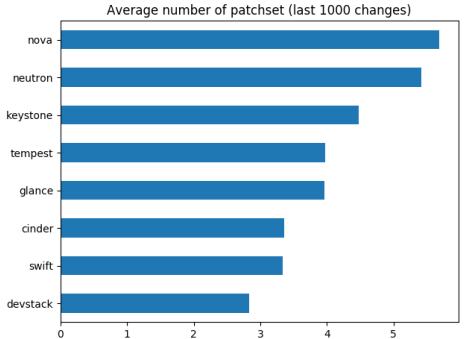
Not the scale I meant...

- Commits
- # of Tests
- # of Configurations

Life as a contributor



Source: subunit2sql DB



Source: Gerrit API

My day in reviews

- Change in devstack:

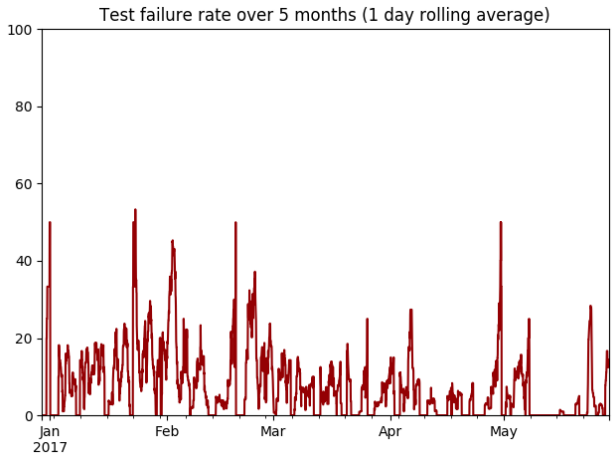
```
536     +    if [ -z "$VRIT_DRIVER" ]; then
537     +        # If there is not virt driver defined we assume nova is not installed
538     +        iniset $TEMPEST_CONFIG service_available nova "False"
539     +    fi
540     +
```

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

- CI reports all green
- Can you see the error?

Keep the gate flowing

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



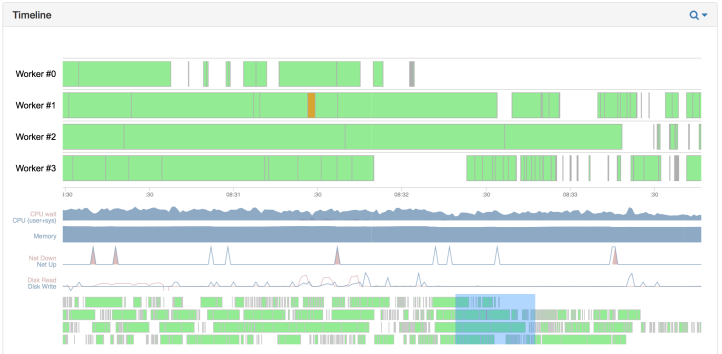
Source: Zuul, Graphite

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

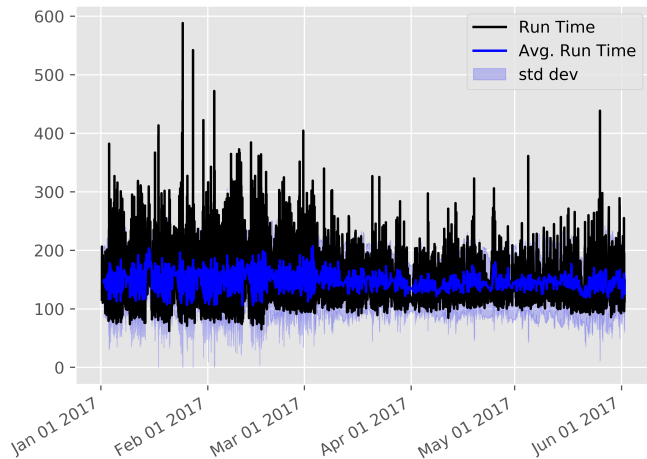
Single run view

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



Reference: Stackviz

Runtime variance



Source: subunit2sql-graph run_time

Deeper into data

- ELK, Elastic Recheck [DEMO: http://status.openstack.org/elastic-recheck/]
- Subunit2sql, OpenStack Health [DEMO: http://status.openstack.org/openstack-health/]

Other Data Sources

- 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 identitify new elastick recheck signatures
- Catch changes in behaviour that we do not test for
- Help review process

References

- http://status.openstack.org
- http://review.openstack.org
- https://docs.openstack.org/developer/subunit2sql/graph.html
- https://github.com/sherjilozair/char-rnn-tensorflow
- https://en.wikipedia.org/wiki/CRM114_(program)
- https://github.com/andreafrittoli/testing_at_scale/

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

Thank you!
Questions?