Testing at Scale
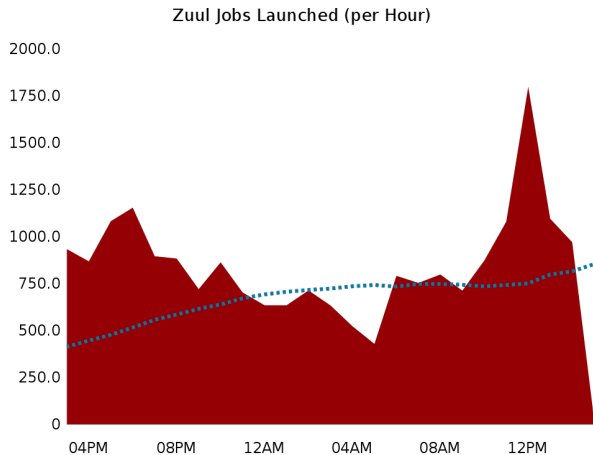
Andrea Frittoli
andrea.frittoli@gmail.com
andreaf on Freenode
@blackchip76 on Twitter
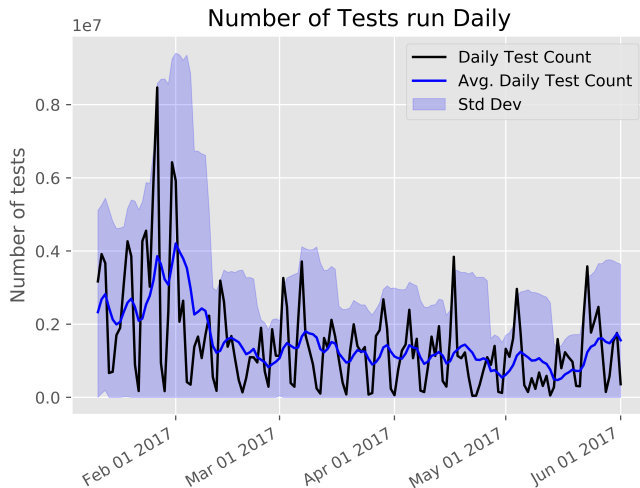
Jun 2, 2017

https://github.com/andreafrittoli/testing_at_scale

OpenStack CI in Numbers

- ∼1500 contributors to Pike
- 6 Clouds + 2 run by OpenStack Infra
- 1600+ repos in openstack(|-dev|-infra)
- 20k lines Zuul configuration

Zuul Jobs Launched (per Hour)

Source: Zuul, Graphite

OpenStack CI in Numbers

Number of Tests run Daily

Source: subunit2sql-graph dailycount
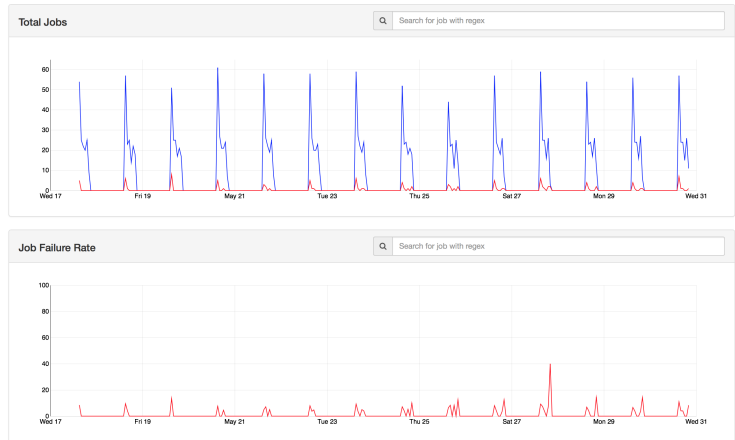
Testing OpenStack

Source: http://status.openstack.org/zuul
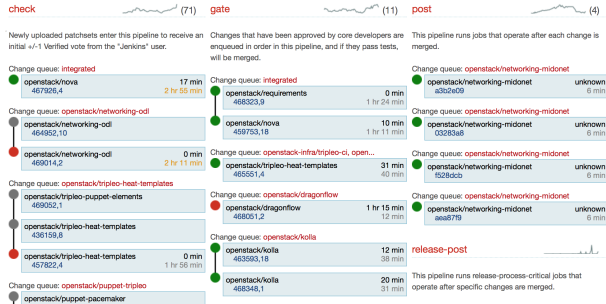
- ▶ Release ready master
- ▶ Check & Gate Pipelines
- ▶ Ephemeral test system

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...
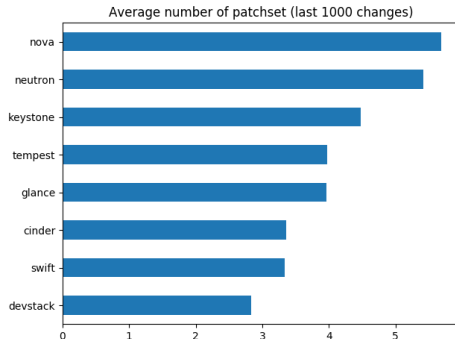
- Commits
- # of Tests
- # of Configurations

Life as a contributor
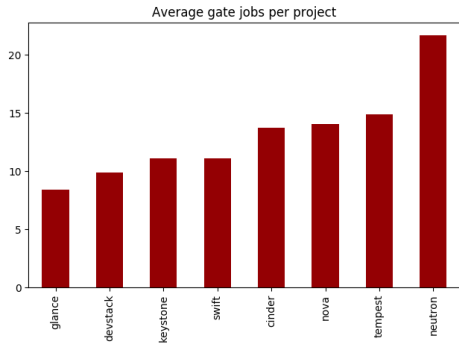
Source: subunit2sql DB

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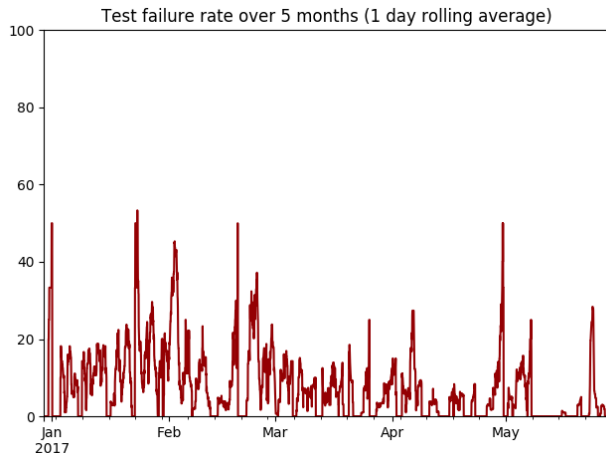
▶ CI reports all green
▶ Can you see the error?

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

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

Deeper into data

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

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

- https://github.com/sherjilozair/char-rnn-tensorflow

Thank you!
Questions?