

# Zuul v3 - OpenStack 인프라 코드로 CI/CD 살펴보기

June 28, 2018

- OpenInfra Days Korea 2018 -

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現 글로벌 오픈프론티어 파트타임 개발자

OpenStack 한국 커뮤니티 3기 대표 (Jan 2017 – Dec 2018)



**KOREA**  
*User Group*



**I18N**  
*an OpenStack Community Project*

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- OpenStack 인프라팀과 Zuul
- Zuul 자세히 알아보기
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  - project-config & system-config
  - zuul-jobs & openstack-zuul-jobs
  - Ansible playbooks for sphinx-docs & translation

# (시작하기 전에..)

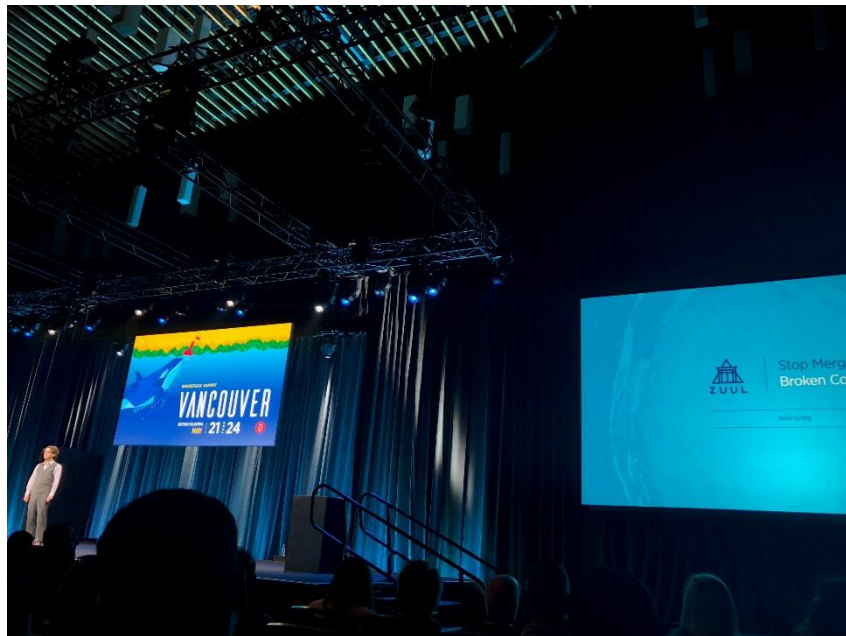
- 밴쿠버 서밋: 키노트로 보는 “오픈 인프라”

- Zuul CI 프로젝트 소개

- OpenStack Foundation에서 주도하는 또 하나의 프로젝트로 CI/CD 분야



Zuul is a new OpenStack Foundation project under the CI/CD Strategic Focus Area.



## Zuul Drives One of the Largest Open Source Project CI Systems



밴쿠버 서밋에 대한 자세한 내용은: <https://www.slideshare.net/ianychoi/openstack-2018-vancouver-summit>

# Zuul이란?

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- (Netflix 사용하고 있는 API 게이트웨이기도 있구요)



# Zuul이란?

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- (멀티 프레임워크 자바스크립트 테스트를 위한 것도 있네요)

GitHub, Inc. [US] | <https://github.com/defunctzombie/zuul>

zuul build failing

Zuul is an easy way to test your javascript in browsers. Start testing your code in seconds locally and move to cloud based browsers seamlessly for better coverage.

Zuul is different than other cross browser test runners in its simplicity and ability to easily run your test suite in many browsers without having them installed locally. It lets you iterate quickly during development and provide good browser coverage before release without worrying about missing a supported browser.

Don't just claim your js supports "all browsers", prove it with tests!



# 이야기하고 싶은 Zuul

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**Stop Merging**  
Broken Code

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[zuul-ci.org](https://zuul-ci.org)

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# CI/CD (Continuous Integration/Development)

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**Past**  
Post-merge

**Present**  
Pre-merge

**Future**  
Gating

# Zuul이란?

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- 하나의 패치가 “Landing” 하기 이전에 여러 시스템 및 응용 프로그램에 걸쳐 “Gating” 변화에 최적화된 오픈 소스 CI/CD 플랫폼
- 테스트 주도 오픈 소스 프로젝트 및 소프트웨어 개발 기관에 적합
  - 여러 프로젝트 및 시스템에 걸친 “Gating” 작업
  - Pluggable: 여러 개발 플랫폼을 지원 (현재 Gerrit 및 GitHub)
  - Ansible 에코시스템을 기반으로 한 third-party 모듈 병합 가능
  - 분산 개발 팀 및 보안을 염두로 전체적인 테스트가 필요한 업체에 적합
- OpenStack 커뮤니티에서 필요로 사용되었던 컴포넌트를 별개 프로젝트로 확장
  - OpenStack 코드 리뷰 + 게이팅에서 사용
  - 수백 만의 패치와 1,800 여개 (의존성을 가진) 저장소에서 검증됨



# Why Zuul?

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- 멀티 시스템 테스트를 위한 게이팅 (인프라에서 앱까지, 여러 프로젝트, 멀티 클라우드 등)
- Ansible로 정의하여 사용
- OpenStack 인프라 시스템에서 사용하면서 검증된 대규모 스케일
- (보안을 염두하는) 대용량 분산 개발 팀에 적합
- 소규모에서 시작하여 대규모까지 툴 변경 없이 사용 가능
- Pluggable & extensible: 다른 커뮤니티 등에서 사용도 가능, 생태계에 의한 지원
- 오픈 소스 + 오픈 커뮤니티

# Case Studies

at launch on Zuul



# Case: MediaWiki

- [https://www.mediawiki.org/wiki/Continuous\\_integration/Zuul](https://www.mediawiki.org/wiki/Continuous_integration/Zuul)



Main page  
Get MediaWiki  
Get extensions  
Tech blog  
Contribute

Support

User help  
FAQ  
Technical manual  
Support desk  
Communication

Development

Bug tracker  
Code repository  
Code docs  
Statistics  
Wikimedia technology  
Wikimedia audiences

English Not logged in Talk Contributions Create account Log in

Page Discussion Read Edit View history Search MediaWiki

## Continuous integration/Zuul

< Continuous integration

 This page needs to be improved: puppet configuration, the layout file, what we do etc.. Also most references to gallium should now refer to contint1001.wikimedia.org. shortcut: CI/Z

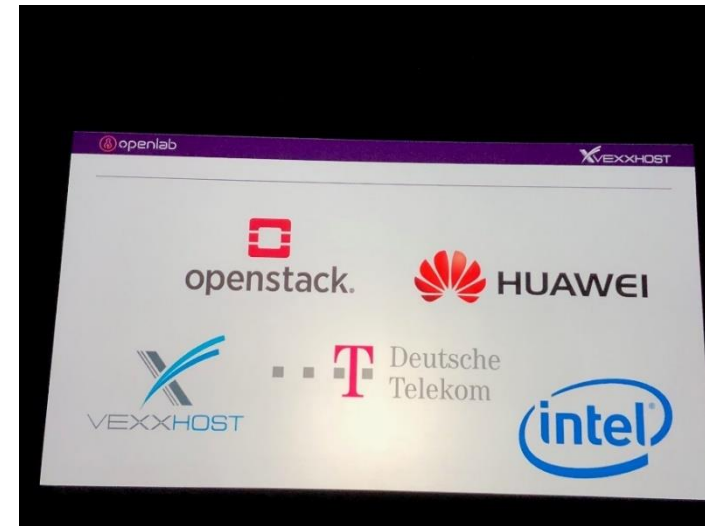
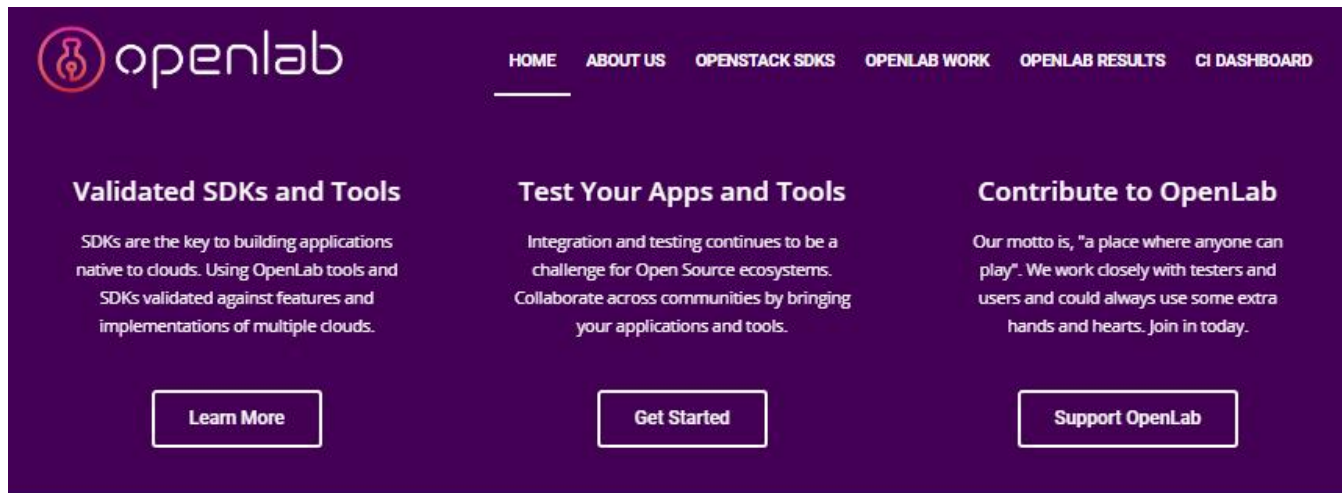
**Zuul** is a python daemon which acts as a gateway between [Gerrit](#) and [Jenkins](#). It listens to Gerrit `stream-events` feed and trigger jobs function registered by Jenkins using the Jenkins Gearman plugin. The jobs triggering specification is written in YAML and hosted in the git repository `integration/config.git` as `/zuul/layout.yaml`.

**Contents** [hide]

- 1 Operational information
- 2 Architecture overview
  - 2.1 Zuul git repositories
  - 2.2 Access by slave to Zuul repositories
  - 2.3 Git replications
  - 2.4 Triggering
  - 2.5 Split between check and test
- 3 Debugging
- 4 Update configuration
  - 4.1 Change configuration
  - 4.2 Deploy configuration

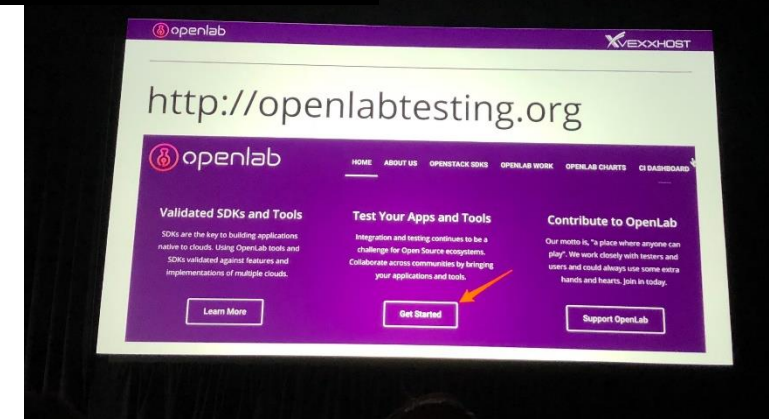
# Case: openlab에 대해

- openlab 발표
  - 테스트/실습을 위한 인프라 (Vancouver Summit에서 발표)



## What is OpenLab?

OpenLab's mission is to enable the testing, reporting, and development of tools and applications for hybrid and multi-cloud environments. OpenLab fulfills its mission by providing a ready to use and easy to replicate platform that tests the usability, reliability, and resiliency of hybrid and multi-cloud tooling. Clouds live in a rich software stack, with key elements "below" and "above". When you consider Open Source points of integration the options are staggering. Open Infrastructure is about helping to reduce the complexity.



# Zuul History

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- 2012년 5월, OpenStack 프로젝트에 대해 통합 코드 리뷰 및 자동화된 테스팅을 위해 고려를 시작
- OpenStack Infrastructure 팀에서 직접 개발, 사용 및 동작
- 필요에 의해 개발되었으며, 여러 OpenStack 프로젝트에 대한 복잡성을 해결하기 위한 방향으로 진화
- 여러 오픈 소스 커뮤니티에서 Zuul을 사용하고자 하면서 별개 프로젝트로 운영하고자 고민
- **Zuul v3**: OpenStack에 의존적인 시스템 부분을 없애면서 보다 넓은 영역에서 지원을 하고자 함

# 참고: Discussion in CNCF

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- <https://lists.cncf.io/g/cncf-ci-public/topic/8008520>

Zuul v3 (was Re: CNCF CI Goals)

Date ▲

<

>



Dan Kohn

2/03/17 #4 

Clint, I appreciate the email, and I'm excited to work with you on demoing Zuul v3 and the GitHub integration. I know that OpenStack has made an enormous investment into Zuul over the last several years and that it is what ensures interoperability between the different portions of their stack.

However, I do want to caution you that I think it's relatively unlikely that CNCF would ever adopt Zuul the way OpenStack has. In particular, I want to emphasize that we do not envision ever mandating the tools that our projects use.

I'm going to take the liberty of making an extended quote from a post by Adrian

Cole, the lead maintainer of Zipkin. They are a potential CNCF project (although they've decided to hold off on a decision around joining for now), and Adrian was discussing how they select tools:

<https://github.com/openzipkin/openzipkin.github.io/issues/51#issuecomment-251843524>



# 참고: Discussion in CNCF

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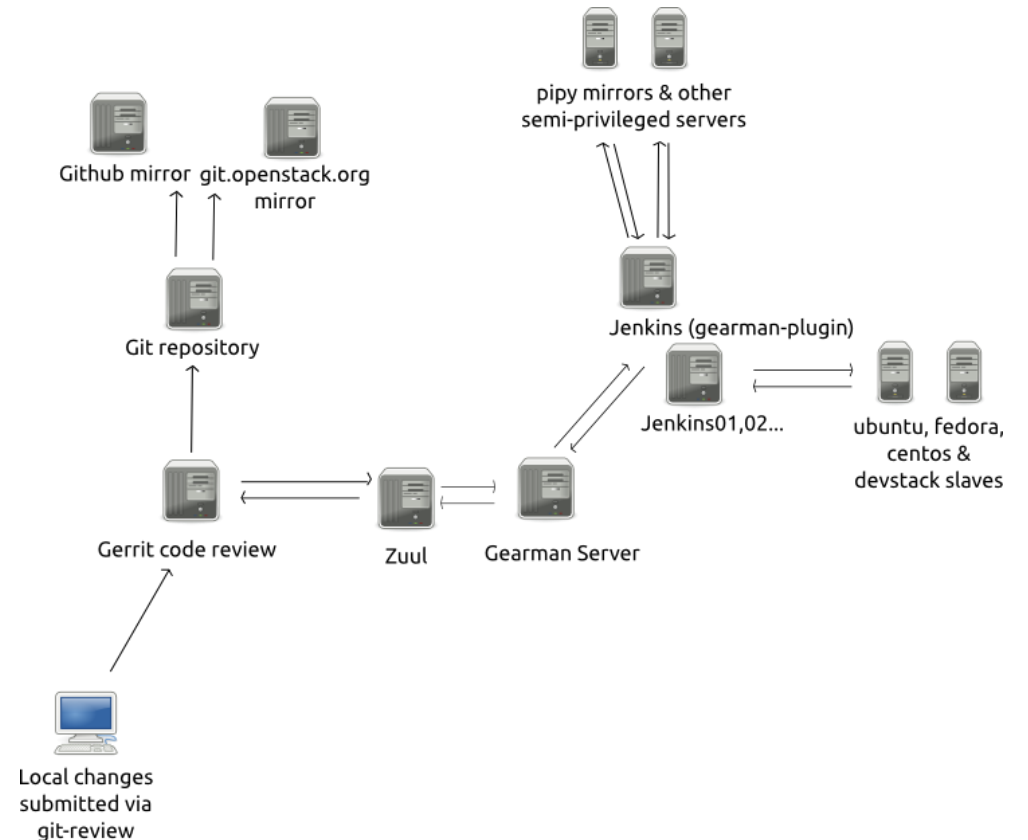
- [CNCF Technical Oversight Committee meeting \(Mar 1, 2017\)](#)

## Community Presentation: Zuul CI


- BonnyCI - Closed beta Zuul-aaS for Open Source Projects
  - Inspired by internal IBM success with Gerrit and Zuul
  - Early feature-incomplete preview of Github support to reach wider audience
  - Closed beta to help us understand how projects will use Zuul
  - Running fork of Zuul v2.5 today
  - Prototyping v3
  - Ready to scale onto any OpenStack cloud
    - Others are a nodepool driver away
- Anybody want to see a demo of Zuul working via Github?

# OpenStack 인프라팀과 Zuul

- OpenStack Infrastructure Team
  - OpenStack 개발 및 주요 서비스 (예: 문서, API 사이트, CI/CD, Etherpad, Ethercalc 등)을 OpenStack 인프라 위에서 구동하는 모든 역할을 담당
  - Instructure as a code
  - Jenkins + Zuul로 사용하다가 Zuul ~2.5로 가면서 Zuul 의존성에서 탈피하였으며 Zuul v3부터는 Jenkins 없이 구동



# 참고: OpenStack – Gerrit 리뷰 시스템 + Zuul



All

**My**

Projects

People

Documentation

ChangesDraftsDraft CommentsEditsWatched ChangesStarred ChangesGroups

Search term

Change

Change 545377 - Merged

Reply...Included in ▼Patch Sets (15/15) ▼Download ▼

**[translation] doc generatepot jobs for 3 projects**

This commit adds horizon, openstack-ansible, and openstack-helm to test project doc translation generation jobs by adding openstack-ansible and openstack-helm to project translation job and dealing with pot files.

Since project doc translation structure is generally divided into multiple directories such as admin, user, install, and contributor, it is a good idea to split into different pot files and manage as different documents in Zanata.

Co-Authored-By: Akihiro Motoki <amotoki@gmail.com>  
Co-Authored-By: Frank Kloeker <f.kloeker@telekom.de>

Change-Id: I84a65f375dbd73f52d7b5d88218f92c53b99a2e9  
Implements: blueprint project-doc-translation-support

Owner

Ian Y. Choi

Reviewers

Akihiro MotokiAlessandro NestaAmy Marrich (spotz)Andreas JaegerEmilien MacchiIan WienandIan Y. ChoiZuulqingszhaoFrank Kloeker

Project

openstack-infra/project-config

Branch

master

Topic

docs-generatepot

Updated

2 days ago

Cherry Pick

Revert

Author	Ian Y. Choi <ianyrchoi@gmail.com>	Feb 17, 2018 1:22 AM
Committer	Ian Y. Choi <ianyrchoi@gmail.com>	Jun 9, 2018 12:40 AM
Commit	de0fd55aacf2c2caaf62bd4bfa54af25e1053d9	(gitweb)
Parent(s)	41641949e7ed5663637e5c7a7af14de362e9a000	(gitweb)
Change-Id	I84a65f375dbd73f52d7b5d88218f92c53b99a2e9	

Code-Review +2

Alexander JaegerIan Wienand

+1

Akihiro MotokiAlessandro NestaAmy Marrich (spotz)Emilien Macchiqingszhao

Verified +2

Zuul

Workflow +1

Ian Wienand

Zuul check (1 rechecks)	Jun 26 7:13 PM
openstack-zuul-jobs-linters	SUCCESS in 5m 23s
project-config-gerrit	SUCCESS in 3m 55s
Zuul gate	Jun 26 7:30 PM
	SUCCESS in 5m 23s

# OpenStack Infrastructure: Jenkins Job Builder

- (Jenkins를 사용하던 시절 pre-merge를 위해 사용)

The screenshot shows a web browser displaying the Jenkins Job Builder documentation. The browser's address bar shows the URL <https://docs.openstack.org/infra/jenkins-job-builder/>. The page has a dark blue sidebar on the left with navigation links: 'Table Of Contents', 'Jenkins Job Builder README' (with sub-links for Developers, Writing a patch, Unit Tests, and Installing without setup.py), 'Contents', 'Indices and tables', 'Next topic' (Quick Start Guide), 'This Page' (Show Source), and 'Quick search' (with a search box and a 'Go' button). The main content area has a title 'Jenkins Job Builder' and a sub-header 'README'. The README text states: 'Jenkins Job Builder takes simple descriptions of Jenkins jobs in YAML or JSON format and uses them to configure Jenkins. You can keep your job descriptions in human readable text format in a version control system to make changes and auditing easier. It also has a flexible template system, so creating many similarly configured jobs is easy.' Below this, it says 'To install:' followed by a code block: `$ pip install --user jenkins-job-builder`. Then it says 'Online documentation:' followed by a bullet point: <http://docs.openstack.org/infra/jenkins-job-builder/>. The next section is titled 'Developers' and contains 'Bug report:' with a bullet point <https://storyboard.openstack.org/#!/project/723>, and 'Repository:' with a bullet point <https://git.openstack.org/cgit/openstack-infra/jenkins-job-builder>.

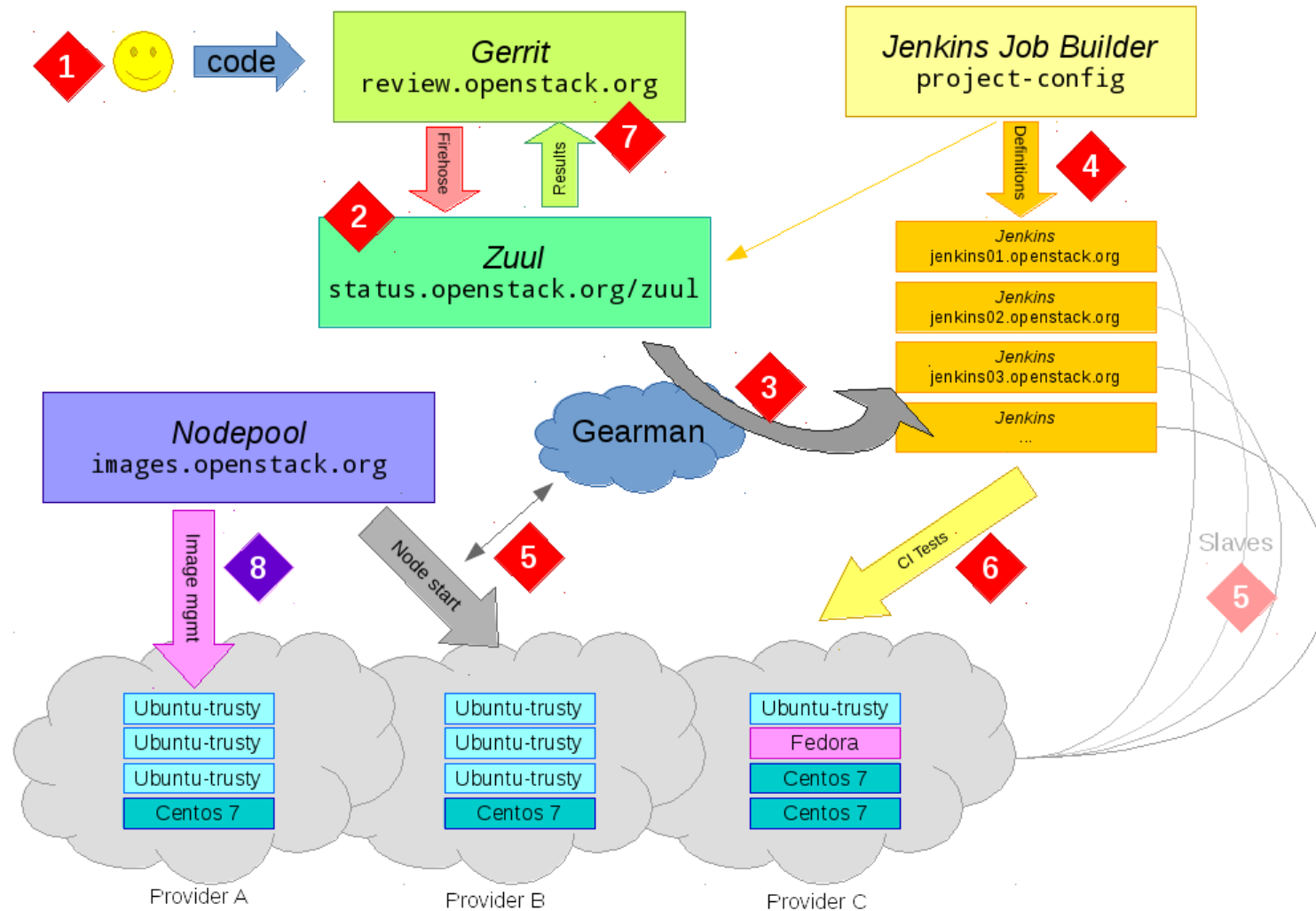
# OpenStack Infrastructure: Jenkins Job Builder

---

- (다른 커뮤니티에서도 검토가 이루어졌을 정도)

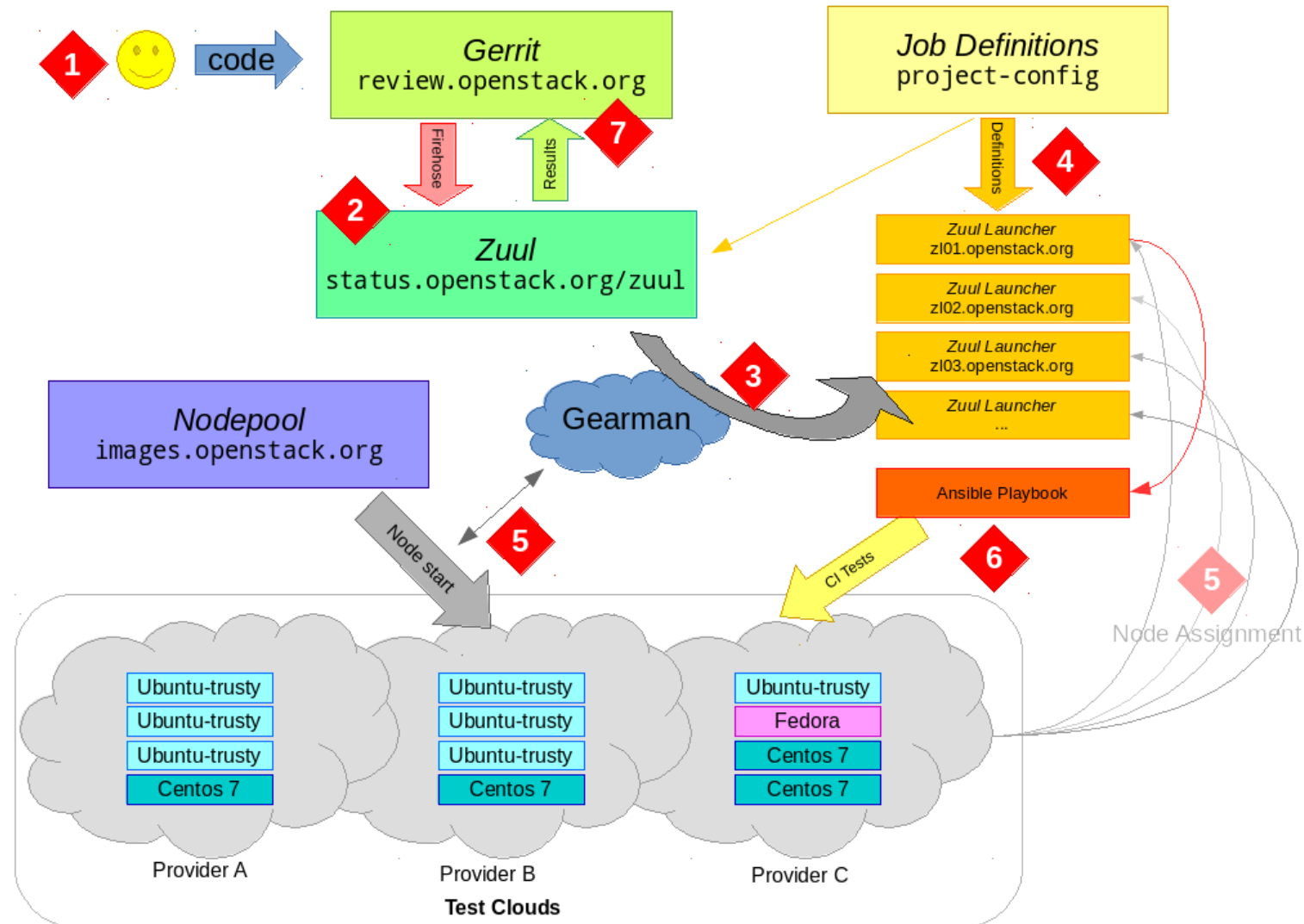


# OpenStack Infrastructure: Jenkins Job Builder





# OpenStack Infrastructure: Jenkins Job Builder



# Zuul 자세히 알아보기

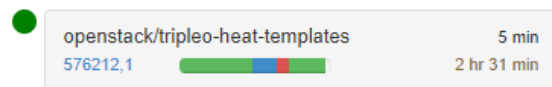
- 여러 프로젝트에 대한 의존성
  - 예시: <http://zuul.openstack.org/>

## check

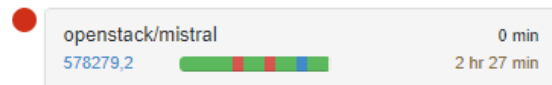
54

Newly uploaded patchsets enter this pipeline to receive an initial +/-1 Verified vote.

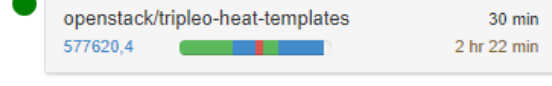
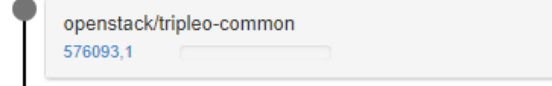
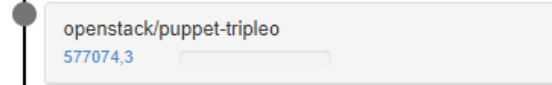
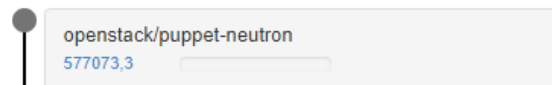
Queue: [openstack/tripleo-heat-templates](#)



Queue: [openstack/mistral](#)



Queue: [openstack/tripleo-heat-templates](#)



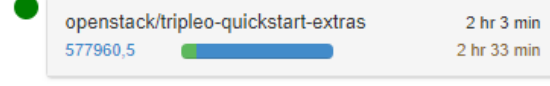
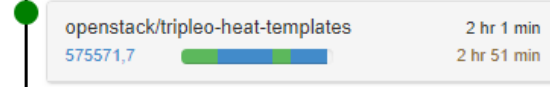
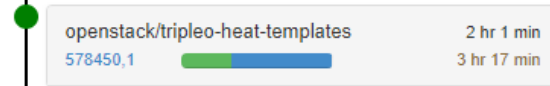
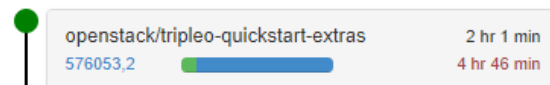
Queue: [openstack/tripleo-common](#)

## gate

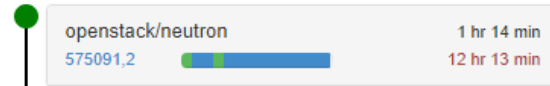
33

Changes that have been approved by core developers are enqueued in order in this pipeline, and if they pass tests, will be merged.

Queue: [tripleo](#)



Queue: [integrated](#)

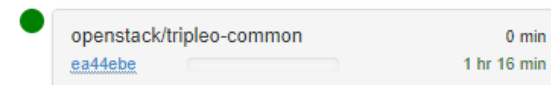


## post

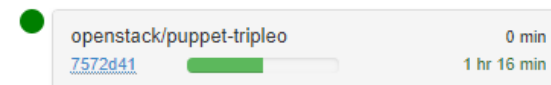
3

This pipeline runs jobs that operate after each change is merged. Queue items are identified by the abbreviated hash (git log --format=%h) of the merge commit.

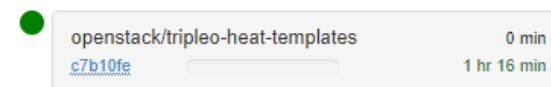
Queue: [openstack/tripleo-common](#)



Queue: [openstack/puppet-tripleo](#)



Queue: [openstack/tripleo-heat-templates](#)



## promote

0

This pipeline runs jobs that operate after each change is merged in order to promote artifacts generated in the gate pipeline.

## pre-release

0

When a commit is tagged with a pre-release tag, this pipeline runs jobs that publish archives and documentation.

# Zuul 자세히 알아보기

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- Zuul 공식 문서: <https://zuul-ci.org/docs/>



## Table Of Contents

[Zuul - A Project Gating System](#)  
[Indices and tables](#)

## Related Topics

[Documentation overview](#)

- [Next: User's Guide](#)

## This Page

[Show Source](#)

## Quick search

## Zuul - A Project Gating System

Zuul is a program that drives continuous integration, delivery, and deployment systems with a focus on project gating and interrelated projects.

Zuul's documentation is organized in three guides based on audience. If Zuul is being used to gate or drive automation around your project, read the [User's Guide](#) to find out how to configure Zuul. If you are installing or operating a Zuul system, you will also find the [Administrator's Guide](#) useful. If you want help make Zuul itself better, take a look at the [Developer's Guide](#).

If you are looking for the Edge routing service named Zuul that is related to Netflix, it can be found here: <https://github.com/Netflix/zuul>

If you are looking for the Javascript testing tool named Zuul, it can be found here: <https://github.com/defunctzombie/zuul>

Contents:

- [User's Guide](#)
  - [Zuul Concepts](#)
  - [Project Gating](#)
  - [Project Configuration](#)
  - [Job Content](#)
  - [Encryption](#)
  - [Badges](#)

# Zuul 자세히 알아보기

- Zuul 프로젝트 저장소: <https://git.zuul-ci.org/cgit>

**git** Zuul git repository browser  
a fast webinterface for the git dscm

index

search

Name	Description	Idle	Links
nodepool	Manage a pool of nodes for a distributed test infrastructure	3 hours	summary log tree
zuul	The Gatekeeper, or a project gating system	3 hours	summary log tree
zuul-base-jobs	Zuul base job definition	3 hours	summary log tree
zuul-jobs	Ansible job definitions for Zuul	3 hours	summary log tree
zuul-sphinx	Sphinx extension for Zuul jobs	3 hours	summary log tree
zuul-website	The contents of the Zuul website	3 hours	summary log tree
zuul-website-media	Large media files for the Zuul website	3 hours	summary log tree

# [Case] OpenStack 인프라

- project-config: 각 프로젝트 저장소에 대한 인프라 Zuul
- system-config: OpenStack 시스템 전반적인 인프라 정의



The screenshot shows the GitHub interface for the `openstack-infra / project-config` repository. The file `project-config / zuul.d / jobs.yaml` is selected, showing a commit by `dhellmann` with the message "add a job to check the metadata for python packages". The file content is displayed as a code block with the following text:


```
1  # Shared zuul config specific to the OpenStack Project
2  # Contains definitions of trusted jobs
3  # Overrides jobs from:
4  #   https://git.openstack.org/cgit/openstack-infra/zuul-jobs
5
6
7  # Changes to this job require a special procedure, because they can
8  # not be tested before landing, and if they are faulty, they will
9  # break all jobs, meaning subsequent corrections will not be able to
10 # land. To make a change:
11 #
12 # 1) Ensure that base-test and its playbooks are identical to base.
13 # 2) Make the change in base-test and dr its playbooks
14 # 3) Merge the change from base-test. We take normally use base-test as
```

At the bottom of the image, the URL <https://github.com/openstack-infra/project-config/blob/master/zuul.d/jobs.yaml> is visible.




# [Case] OpenStack 인프라

- zuul-jobs: Zuul에서 볼 때 공통으로 필요할 것 같은 공통의 job을 Ansible로 정의


Branch: master ▾ zuul-jobs / playbooks / sphinx /

 emonty Add general sphinx and reno jobs and role ...

..

 <a href="#">post.yaml</a>	Add general sphinx and reno jobs and role
 <a href="#">pre.yaml</a>	Add general sphinx and reno jobs and role
 <a href="#">run.yaml</a>	Add general sphinx and reno jobs and role

Branch: master ▾ zuul-jobs / playbooks / sphinx / pre.yaml

 emonty Add general sphinx and reno jobs and role

1 contributor

8 lines (7 sloc) | 145 Bytes

```
1 - hosts: all
2   roles:
3     - role: bindep
4       bindep_profile: doc
5       bindep_dir: "{{ zuul_work_dir }}"
6   - ensure-sphinx
7   - invoke-sudo
```

<https://github.com/openstack-infra/zuul-jobs/tree/master/playbooks/sphinx>



# [Case] OpenStack 인프라

---

- openstack-zuul-jobs: OpenStack에 특화된 작업


📁 <a href="#">configure-swap</a>	Fix ansible-lint job
📁 <a href="#">configure-unbound</a>	Use hostvars to get ansible_default_ipv6
📁 <a href="#">kata-setup</a>	Add fedora 28 support to kata runsh job
📁 <a href="#">legacy-copy-jenkins-scripts</a>	Create old jenkins directories
📁 <a href="#">mirror-info</a>	Add NODEPOOL_MARIADB_PROXY and drop NODEPOOL_MARIADB_MIRROR
📁 <a href="#">neutron-horizon-hack</a>	Update README for neutron-horizon-hack
📁 <a href="#">prepare-docs-for-afs</a>	Fix publishing tagged docs
📁 <a href="#">prepare-infra-docs-for-afs</a>	Fix publishing tagged docs
📁 <a href="#">set-service-type-data-fact</a>	Refactor fact configuration for service_type_data
📁 <a href="#">write-root-marker</a>	Make AFS marker roles honor sphinx variables

<https://github.com/openstack-infra/openstack-zuul-jobs/tree/master/roles>

# [Case] OpenStack 인프라

- Ansible playbooks for Sphinx-docs

Branch: master ▾ [zuul-jobs](#) / [playbooks](#) / [sphinx](#) / [run.yaml](#)

 emonty Add general sphinx and reno jobs and role

1 contributor

5 lines (4 sloc) | 59 Bytes

```
1 - hosts: all
2   roles:
3     - install-if-python
4     - sphinx
```

Code-Review

Verified +1 Zuul

Workflow

Zuul check		4:41 PM
openstack-tox-pep8	SUCCESS	in 10m 42s
openstack-tox-py27	SUCCESS	in 13m 04s
openstack-tox-py35	SUCCESS	in 12m 27s
build-openstack-sphinx-docs	SUCCESS	in 8m 09s
openstack-tox-lower-constraints	SUCCESS	in 16m 29s
Intel PCI CI		4:36 PM
pci-test	SUCCESS	

Example: <https://review.openstack.org/#/c/578019/>

# [Case] OpenStack 인프라

---

- Ansible playbooks for translation sync

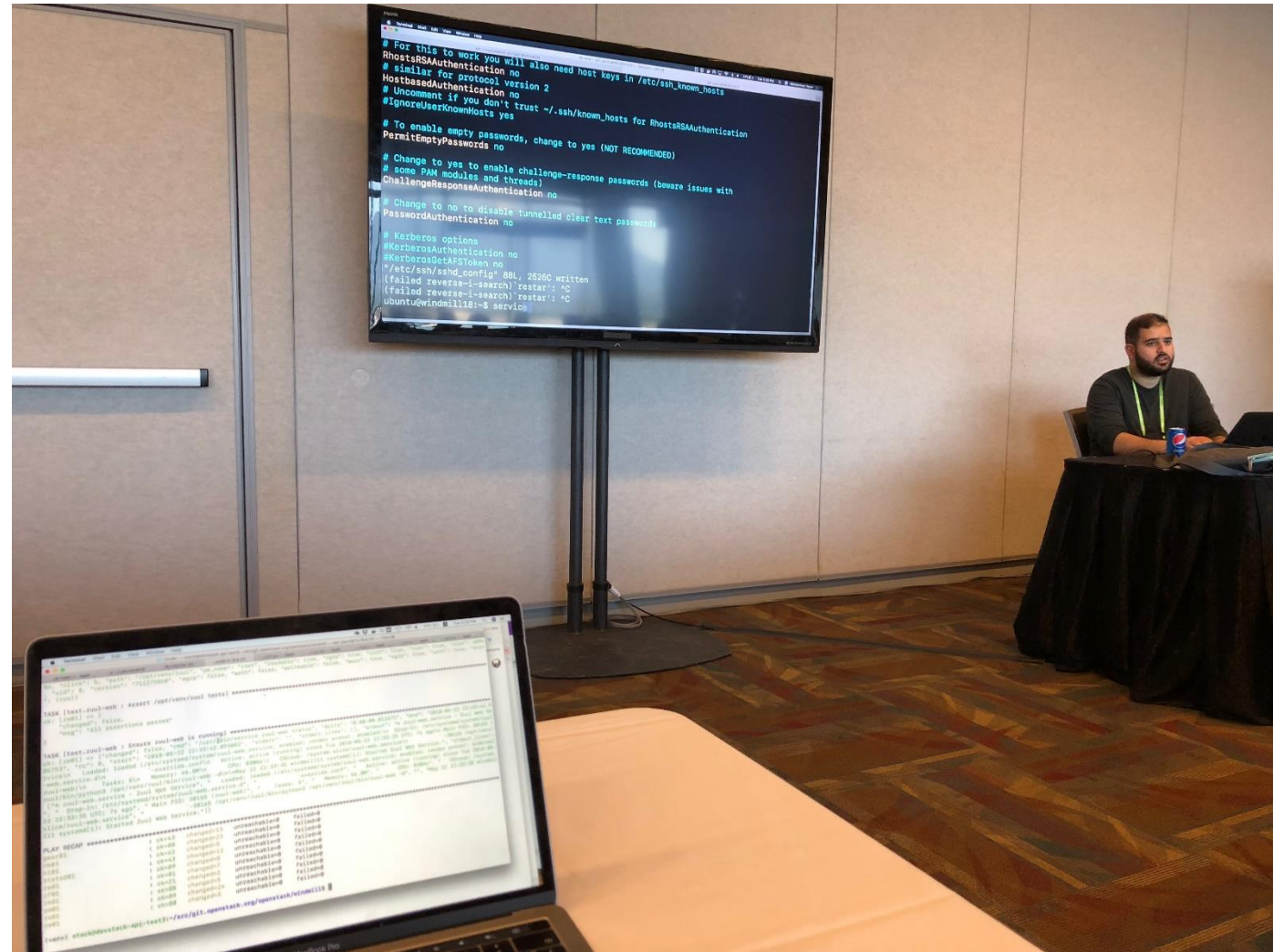
```
---
- hosts: all
  roles:
    - prep-zanata
    - legacy-zuul-git-prep-upper-constraints

  tasks:
    - name: Run upstream_translation_update.sh script
      command: "{{ ansible_user_dir }}/scripts/upstream_translation_update.sh {{ zuul.project.short_name }} {{ zuul.job }} {{zuul.branch}}"
      args:
        chdir: "{{ zuul.project.src_dir }}"

- hosts: all
  roles:
    - fetch-translation-output
    - fetch-translations-subunit-output
```

# [참고]

- Zuul 워크샵
  - Vancouver Summit에서 OpenDev CI/CD 핸즈온랩
  - CI/CD 를 직접 구축하는 방법에 대해 배울 수 있었던 시간
  - Ansible playbook을 실행하여 구축하며, GitHub와 연동하는 방식을 실습하였음



# 감사합니다.

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