

# Система непрерывной интеграции на примере OpenStack CI

Роман Подоляка, инженер по разработке ПО в DataRobot

ХНУРЭ

26.06.2018

Харьков, Украина

# Непрерывная интеграция

Continuous Integration is a software development practice where members of a team integrate their work frequently, usually each person integrates at least daily - leading to multiple integrations per day. Each integration is verified by an automated build (including test) to detect integration errors as quickly as possible.

*Мартин Фаулер*

Оригинал статьи в блоге Мартина:

<https://martinfowler.com/articles/continuousIntegration.html>

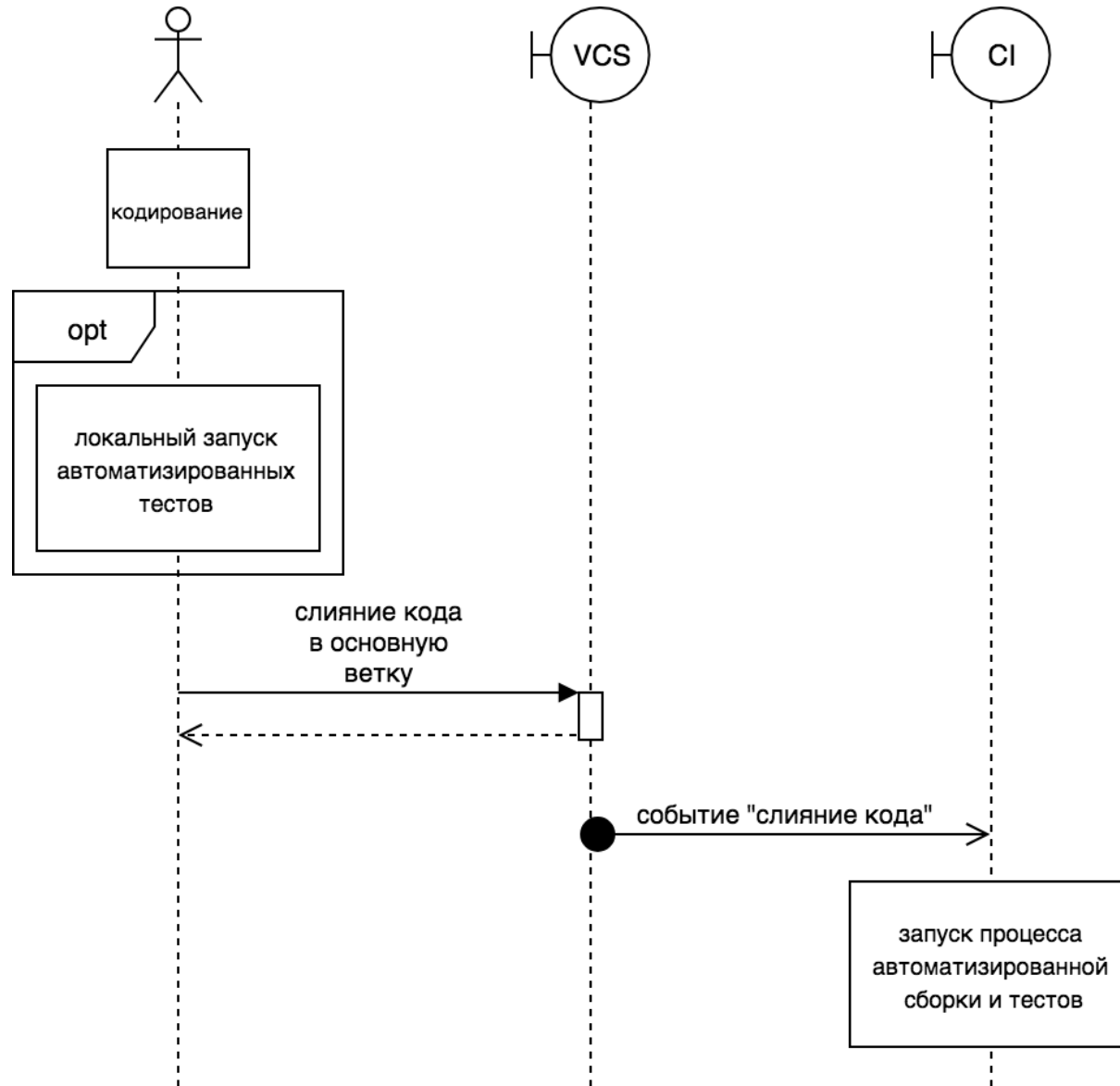
# Задачи непрерывной интеграции

- Выявление проблем при интеграции кода как можно раньше
- Устранение фактора человеческой ошибки
- Обнаружение регрессий посредством регулярных запусков автоматизированных тестов

# Компоненты системы непрерывной интеграции

- Система контроля версий (например: Git, Mercurial, Subversion)
- Сервер автоматизации сборки (например: Jenkins, TeamCity, Zuul)
- Система код-ревью (например: GitHub/Bitbucket PR, Gerrit)

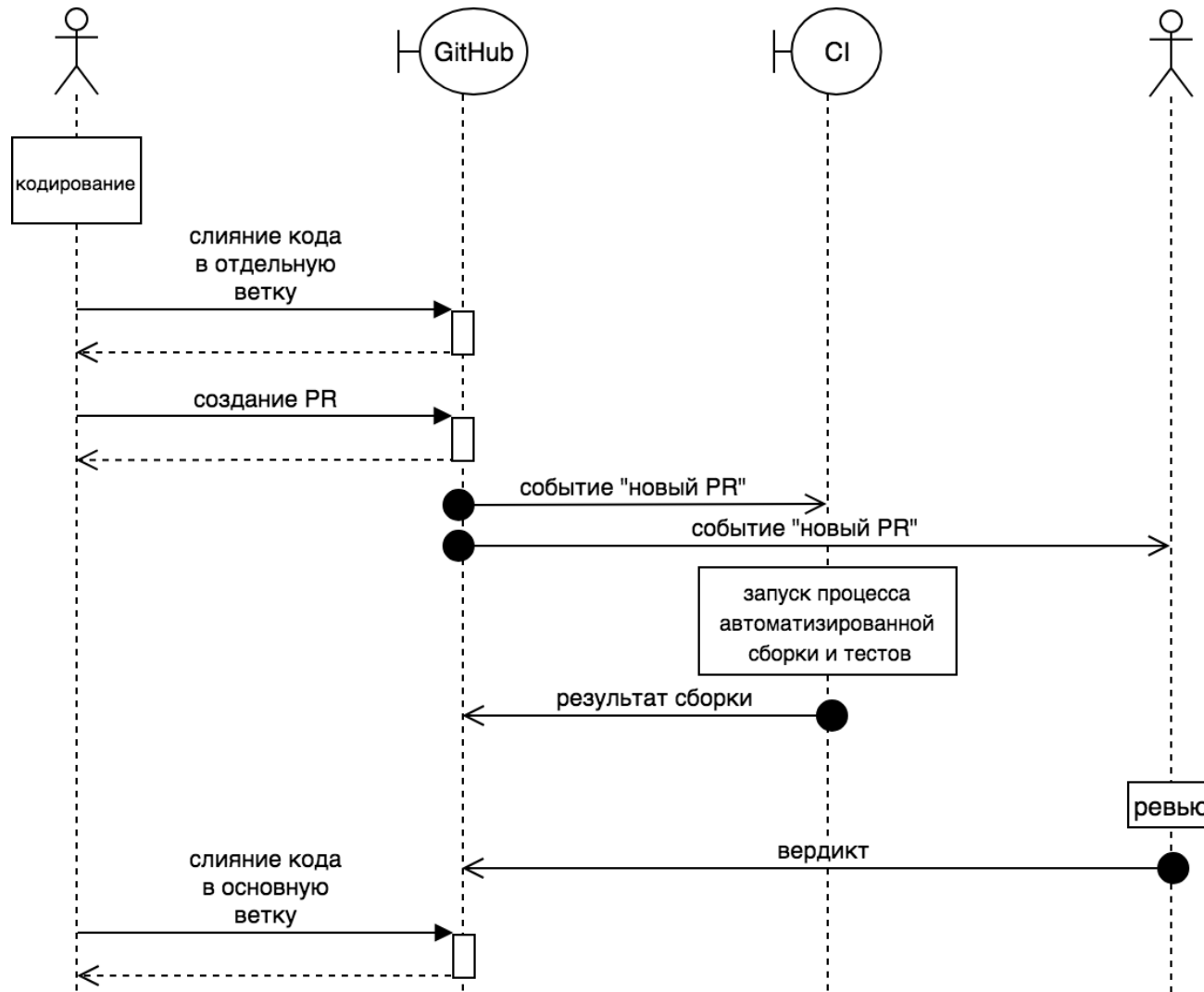
# Классическая система непрерывной интеграции



# Недостатки классической системы непрерывной интеграции

- поздняя обратная связь (только после фактического слияния кода в основную ветку разработки)
- каждая интеграция потенциально ломает основную ветку и тормозит разработку для всех



# Система непрерывной интеграции на примере открытого проекта в GitHub





# Недостатки CI, интегрированного с GitHub



- гонки при слиянии кода потенциально ломают основную ветку разработки
- например: <https://github.com/xsnippet/xsnippet-api/pull/94> и <https://github.com/xsnippet/xsnippet-api/pull/91> успешно прошли тесты независимо друг от друга, но сломали сборку после слияния - <https://travis-ci.com/xsnippet/xsnippet-api/builds/77145796>




2 ■■■■ setup.py View   ▾

```
@@ -39,7 +39,7 @@ def find_packages(namespace):
39 39     'pytest-runner',
40 40 ],
41 41     install_requires=[
42 -     'aiohttp >= 2.3.5, < 3',
42 +     'aiohttp >= 3.0.0, < 4',
43 43     'cerberus >= 0.9.2',
44 44     'motor >= 1.1',
45 45 +     'python-jose >= 1.3.2',
```

2 ■■■■ xsnippet/api/application.py View   ^

10 ■■■■ xsnippet/api/resource.py View   ^

12 ■■■■ xsnippet/api/resources/snippets.py View   ▾

```
@@ -197,17 +197,17 @@ class Snippets(resource.Resource):
197 197     if syntaxes:
198 198         v.schema['syntax']['allowed'] = syntaxes
199 199
200 -     if not v.validate(dict(self.request.GET)):
200 +     if not v.validate(dict(self.request.query)):
201 201         error = '%s.' % cerberus_errors_to_str(v.errors)
202 202         raise web.HTTPBadRequest(reason=error)
203 203
```

1 ■■■■■ xsnippet/api/resources/snippets.py



```
@@ -212,6 +212,7 @@ class Snippets(resource.Resource):
```

```
212 212         # actual snippets to be returned
213 213         current_page = await services.Snippet().get(
214 214             title=title, tag=tag, syntax=syntax,
215 215 +             author=self.request.GET.get('author'),
215 216             # read one more to know if there is next page
216 217             limit=limit + 1,
217 218             marker=marker,
```



7 ■■■■ xsnippet/api/services/snippet.py



```
@@ -95,8 +95,9 @@ def __init__(self, database):
```

```
95 95         async def replace(self, snippet):
96 96             return await self.update(self._normalize(snippet))
97 97 +
98 98 -         async def get(self, *, title=None, tag=None, syntax=None, limit=100,
99 99 -             marker=None, direction='forward'):
100 100 +         async def get(self, *, title=None, tag=None, syntax=None,
101 101 +             author=None,
102 102 +             limit=100, marker=None, direction='forward'):
103 103             condition = {}
104 104
105 105             sort = self._pagination[direction]['sort']
```



```
@@ -108,6 +109,8 @@ def __init__(self, database):
```

```
108 109             condition['tags'] = tag
109 110             if syntax is not None:
110 111                 condition['syntax'] = syntax
111 111
112 112 +             if author is not None:
113 113 +                 condition['author'] = syntax
```



## All checks have passed

[Hide all checks](#)

5 successful checks



**Travis CI - Branch** Successful in 3m — Build Passed

[Details](#)



**Travis CI - Pull Request** Successful in 3m — Build Passed

[Details](#)



**continuous-integration/travis-ci/pr** — The Travis CI build passed

[Details](#)



**continuous-integration/travis-ci/push** — The Travis CI build passed

[Details](#)




**coverage/coveralls** — Coverage decreased (-0.2%) to 93.889%

[Details](#)

 xsnippet / xsnippet-api  build passing

[Current](#) [Branches](#) [Build History](#) [Pull Requests](#) > [Build #27](#)

More options 



**✖ pre-aiobump Merge pull request #91 from xsnippet/author** -o- #27 failed


Add author query param


-o- Commit 82e8a68 [↗](#)


🔗 Compare b179aef..82e8a68 [↗](#)

🔗 Branch pre-aiobump [↗](#)







 Roman Podoliaka authored  GitHub committed

 Ran for 4 min 52 sec

 Total time 9 min 8 sec

 27 12 minutes ago

Build Jobs

<b>✖ # 27.1</b>	 </> Python: 3.5	 TOXENV=py35	 2 min 15 sec
<b>✖ # 27.2</b>	 </> Python: 3.6	 TOXENV=py36	 1 min 38 sec

# Gerrit

- система код-ревью с открытым исходным кодом для Git от Google
- используется разработчиками OpenStack / Go / Android / SQLAlchemy и многими другими
- выступает промежуточным звеном между централизованным сервером системы контроля версий и разработчиками

<https://www.gerritcodereview.com/>

<https://review.openstack.org/>



## My Reviews

Subject	Status	Owner	Project	Branch	Updated	Size	CR	V	W
<b>Outgoing reviews</b>									
☆ block_device: fix propagation of instance AZ to Cinder		Roman Podoliaka	openstack/nova	master (bug/1497253)	Feb 17	+39, -9	+1 Sam Morrison	+1 Zuul	
☆ neutron: re-raise 401 for a non-admin client	Merge Conflict	Roman Podoliaka	openstack/nova	master (bug/1657774)	Oct 25, 2017	+41, -7	-1 Liping Mao	+1 IBM PowerKVM	
<b>Incoming reviews</b>									
☆ Adds view builders for keypairs controller		Pavel Kholkin	openstack/nova	master (keypairs_views)	Jun 13	+74, -53	+1 Leopard Ma	+1 Zuul	
★ Add spec for high availability testing		Sampath Priyankara (samP)	openstack/qa-specs	master (bp/openstack-dt-patch7)	May 21	+193, -0	-1 Adam Spiers	+1 Zuul	
★ Strict isolation of group of hosts for images		Pavel Kholkin	openstack/nova-specs	master (bp/is)	Mar 22	+290, -0	-1 Jay Pipes	+1 Zuul	
☆ Fix problem unable disable iptables service		Leehom Li	openstack/diskimage-builder	master (bug/1656148)	Jun 2, 2017	+10, -1		+1 Jenkins	✗Leehom Li

Change 366724 - Needs Workflow Label

Reply...

**block\_device: fix propagation of instance AZ to Cinder**

When choosing an AZ for a volume to be created an instance host must be considered, as it effectively defines the AZ the instance was scheduled to.

The value of `availability_zone` attribute of the instance object, that is used now, is actually a different thing - it's the AZ requested by a user on creation of the instance and it will be `None`, if any particular AZ was chosen. In this case, Cinder will use its own default (not aligned with Nova one), which may break volume attachment, if cross zone attachment is disabled.

Closes-Bug: #1497253

Change-Id: Ic8693c143dd61c5d61e9676e3915a3278a8af10b

Author	Roman Podoliaka <rpodolyaka@mirantis.com>	Sep 7, 2016 1:36 PM
Committer	Matt Riedemann <mriedem.os@gmail.com>	Dec 23, 2017 4:25 PM
Commit	854488d1704931aede0b111934ac387992787a0c	(gitweb)
Parent(s)	c5e0f61724e8a3a084a3492a01a5a4214b397b32	(gitweb)
Change-Id	Ic8693c143dd61c5d61e9676e3915a3278a8af10b	

**Owner** Roman Podoliaka

**Uploader** Matt Riedemann

**Reviewers**

- Chris Dent x Christopher Martin x Citrix XenServer CI x IBM PowerKVM CI x Intel NFV CI x Jiri Suchomel x Sam Morrison x Serhii Lystopad x Timofey Durakov x VMware NSX CI x Zuul x
- Cloudbase Nova Hyper-V CI x IBM PowerVM CI x IBM zKVM CI x IBM zVM CI x Intel Experimental CI x Intel PCI CI x Ivan Kolodyazhny x Lee Yarwood x Matt Riedemann x Mellanox CI x Microsoft Hyper-V CI x Microsoft Hyper-V Compute CI x Pavlo Shchelokovskyy x Quobyte CI x Radek Zetik x Sylvain Bauza x Virtuozzo CI x Virtuozzo Storage CI x Vladyslav Drok x XenProject CI x

**Project** openstack/nova

**Branch** master

**Topic** bug/1497253

**Strategy** Merge if Necessary

**Updated** 4 months ago

Cherry Pick Rebase Abandon Follow-Up

Code-Review +1 Chris Dent x Jiri Suchomel x Sam Morrison x

Verified +1 IBM PowerKVM CI x Zuul x

Workflow

Zuul check (3 rechecks)	Feb 16 5:43 PM
openstack-tox-pep8	SUCCESS in 7m 28s
openstack-tox-py27	SUCCESS in 11m 10s
openstack-tox-py35	SUCCESS in 13m 00s
build-openstack-sphinx-docs	SUCCESS in 6m 05s
legacy-tempest-dsvm-neutron-full	SUCCESS in 1h 17m 11s
tempest-full	SUCCESS in 1h 20m 23s

**Andrey Volkov**

Patch Set 2: Code-Review-1

Mar 14, 2017 ↔

Today I can formulate more clearly )

We have "admin" ClientWrapper parameter which means for me something like "with additional permissions".

But that parameter depends on context.auth\_token which is strange.

Now I see that it's used only in ClientWrapper.proxy and isn't passed to parent class (no super in init).

Possibly, it's worth to rename param to be closer to reality, maybe

ClientWrapper(..., raise\_unauthorized=...).

**Roman Podoliaka**

Patch Set 2:

Mar 14, 2017 ↔

(1 comment)

Thanks for review, Andrey!

>>> We have "admin" ClientWrapper parameter which means for me something like "with additional permissions".

No, ClientWrapper is essentially a thing that can properly propagate errors returned by neutron-server back to the user, who issued a request to nova-api. E.g. if you do `nova list` and the token expires when nova-api goes to neutron-server to fill in the data on instance network ports. Instead of failing with 500 Internal Error, ClientWrapper will make sure we properly propagate 401 Unauthorized back to the user, so that he/she can re-authenticate and retry the request using the new token.

[nova/network/neutronv2/api.py](#)

**Line 154:**

This is done specifically, so that we raise the correct exception in ClientWrapper, when the token expires - i.e. Unauthorized at #107 and \*not\* NeutronAdminCredentialConfigurationInvalid at #115.

Condition `(context.is\_admin and not context.auth\_token)` denotes a request to Neutron issued from \*within\* Nova using the \*service credentials\* from nova.conf.

`context.is\_admin and context.auth\_token`, on the other hand, would be a request to nova-api performed by a user with admin role (e.g. ceilometer polling agent), that also needs to go to neutron-server on behalf of that user, i.e. using the given `auth\_token`.

The problem here was that we raised an incorrect exception in the case when a token nova-api was given expired right at the moment when it reached neutron-server: instead of propagating 401 back to the user, who did the request (in my case - ceilometer-polling-agent), we mistakenly treated that as a configuration error, as if the neutron credentials in nova.conf were incorrect (although we did not use them at all for this kind of request to neutron-server).



|

-1 0 +1

**Code-Review**    No score

**Workflow**   Ready for reviews

**Post**

**Cancel**

# Zuul

- система непрерывной интеграции с фокусом на "gating" (управляемое слияние кода) и тестирование связанных проектов
- автоматизация сборок и запуска тестов посредством Ansible playbooks
- YAML-конфигурация, подгружаемая из дерева тестируемых проектов

<https://docs.openstack.org/infra/zuul/>

<http://zuul.openstack.org/>

Queue lengths: 0 events, 0 management events, 0 results.

Filters

Expand by default: 

## check

16

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

Queue: [openstack-dev/devstack](#)

Job Name	Status	Duration
openstack-dev/devstack 565923,12		0 min 2 hr 52 min
tempest-full	success	
neutron-grenade	success	
tempest-full-py3	success	
build-openstack-sphinx-docs	success	
openstack-tox-bashate	success	
ironic-tempest-dsvm-ipa-wholedisk-bios-agent_ipmitool-tinyipa (non-voting)	success	
legacy-devstack-dsvm-updown	success	
legacy-swift-dsvm-functional (non-voting)	success	
neutron-grenade-multinode	success	
neutron-tempest-linuxbridge	failure	
neutron-tempest-multinode-full (non-voting)	success	
devstack	success	

## gate

1

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

Queue: [openstack/python-openstackclient](#)

Job Name	Status	Duration
openstack/python-openstackclient 576514,1		17 min 1 hr 17 min
openstack-tox-pep8	success	
openstack-tox-py27	success	
openstack-tox-py35	success	
build-openstack-sphinx-docs	success	
legacy-tempest-dsvm-neutron-src		
osc-tox-py27-tips	success	
osc-tox-py35-tips	success	
osc-functional-devstack	success	
openstack-tox-lower-constraints	success	

## post

1

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.

Job Name	Status	Duration
openstack/networking-mlnx c9d977d		0 min 3 min
publish-openstack-python-branch-tarball	queued	

## 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.









## release

0

When a commit is tagged as a release, this pipeline runs jobs that publish archives and documentation.

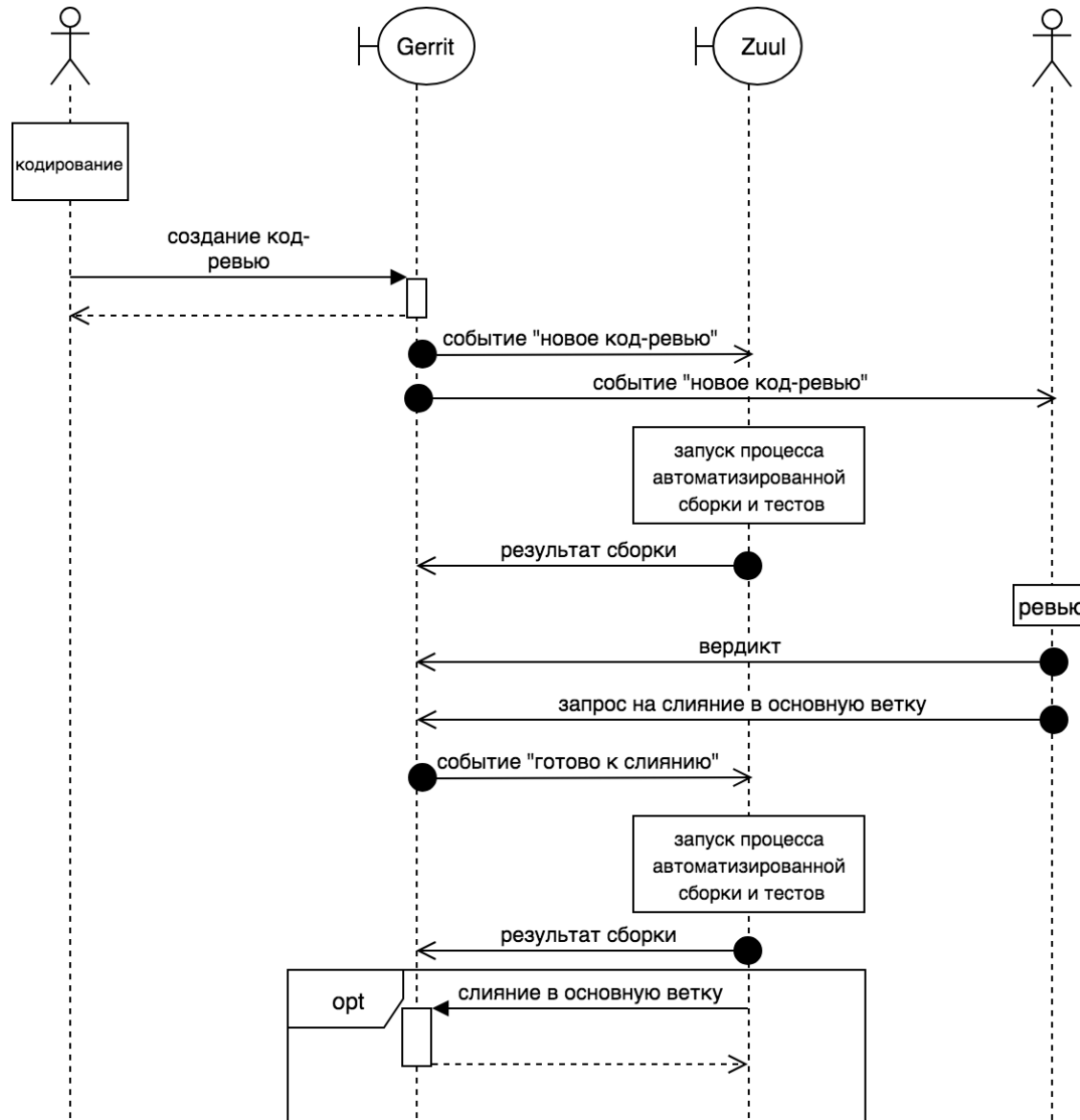
← → ↻ ⓘ logs.openstack.org/14/576514/1/gate/openstack-tox-py27/6eccb81/

## Index of /14/576514/1/gate/openstack-tox-py27/6eccb81

<u>Name</u>	<u>Last modified</u>	<u>Size</u>	<u>Description</u>
 <a href="#">Parent Directory</a>		-	
 <a href="#">ara-report/</a>	2018-05-04 12:59	-	
 <a href="#">job-output.json.gz</a>	2018-06-24 11:55	121K	
 <a href="#">job-output.txt.gz</a>	2018-06-24 11:55	67K	
 <a href="#">testr_results.html.gz</a>	2018-06-24 11:54	63K	
 <a href="#">testrepository.subunit.gz</a>	2018-06-24 11:54	85K	
 <a href="#">tox/</a>	2018-06-24 11:54	-	
 <a href="#">zuul-info/</a>	2018-06-24 11:51	-	

```
2018-06-24 13:00:27.910106 | primary | {3} tempest.api.volume.test_volume_delete_cascade.VolumesDeleteCascade.test_volume_from_snapshot_cascade_delete [8.618825s] ... ok
2018-06-24 13:00:31.872800 | primary | {2} tempest.api.volume.admin.test_volume_types_extra_specs.VolumeTypesExtraSpecsTest.test_volume_type_extra_spec_create_get_delete [0.265942s] ... ok
2018-06-24 13:00:32.030731 | primary | {2} tempest.api.volume.admin.test_volume_types_extra_specs.VolumeTypesExtraSpecsTest.test_volume_type_extra_specs_list [0.157177s] ... ok
2018-06-24 13:00:32.417004 | primary | {2} tempest.api.volume.admin.test_volume_types_extra_specs.VolumeTypesExtraSpecsTest.test_volume_type_extra_specs_update [0.385833s] ... ok
2018-06-24 13:00:34.768140 | primary | {3} tempest.api.volume.test_volume_metadata.VolumesMetadataTest.test_crud_volume_metadata [0.641702s] ... ok
2018-06-24 13:00:35.194205 | primary | {3} tempest.api.volume.test_volume_metadata.VolumesMetadataTest.test_update_show_volume_metadata_item [0.427260s] ... ok
2018-06-24 13:00:35.855220 | primary | {2} tempest.api.volume.admin.test_volume_types_negative.VolumeTypesNegativeTest.test_create_volume_with_private_volume_type [0.250756s] ... ok
2018-06-24 13:00:35.872408 | primary | {2} tempest.api.volume.admin.test_volume_types_negative.VolumeTypesNegativeTest.test_create_with_empty_name [0.016860s] ... ok
2018-06-24 13:00:35.911344 | primary | {2} tempest.api.volume.admin.test_volume_types_negative.VolumeTypesNegativeTest.test_delete_nonexistent_type_id [0.038323s] ... ok
2018-06-24 13:00:35.939049 | primary | {2} tempest.api.volume.admin.test_volume_types_negative.VolumeTypesNegativeTest.test_get_nonexistent_type_id [0.028125s] ... ok
2018-06-24 13:00:38.336196 | primary | {2} tempest.api.volume.test_availability_zone.AvailabilityZoneTestJSON.test_get_availability_zone_list [0.135958s] ... ok
2018-06-24 13:00:45.191429 | primary | {2} tempest.api.volume.test_volume_transfers.VolumesTransfersTest.test_create_get_list_accept_volume_transfer [4.389359s] ... ok
2018-06-24 13:00:49.840814 | primary | {2} tempest.api.volume.test_volume_transfers.VolumesTransfersTest.test_create_list_delete_volume_transfer [4.647289s] ... ok
2018-06-24 13:01:31.918433 | primary | {3} tempest.api.volume.test_volumes_backup.VolumesBackupsTest.test_backup_create_attached_volume [53.829559s] ... ok
2018-06-24 13:03:05.140175 | primary | {3} tempest.api.volume.test_volumes_backup.VolumesBackupsTest.test_bootable_volume_backup_and_restore [93.200431s] ... ok
2018-06-24 13:04:24.131296 | primary | {3} tempest.api.volume.test_volumes_backup.VolumesBackupsTest.test_volume_backup_create_get_detailed_list_restore_delete [78.966967s] ... ok
2018-06-24 13:05:00.762706 | primary | {3} tempest.api.volume.test_volumes_backup.VolumesBackupsV39Test.test_update_backup [32.485457s] ... ok
2018-06-24 13:05:10.781718 | primary | {3} tempest.api.volume.test_volumes_clone.VolumesCloneTest.test_create_from_bootable_volume [6.141521s] ... ok
2018-06-24 13:05:15.282578 | primary | {3} tempest.api.volume.test_volumes_clone.VolumesCloneTest.test_create_from_volume [4.499921s] ... ok
2018-06-24 13:05:28.176601 | primary | {3} tempest.api.volume.test_volumes_get.VolumesGetTest.test_volume_create_get_update_delete [6.351992s] ... ok
2018-06-24 13:05:37.384487 | primary | {3} tempest.api.volume.test_volumes_get.VolumesGetTest.test_volume_create_get_update_delete_as_clone [9.205694s] ... ok
2018-06-24 13:05:45.009801 | primary | {3} tempest.api.volume.test_volumes_get.VolumesGetTest.test_volume_create_get_update_delete_from_image [7.624995s] ... ok
2018-06-24 13:05:49.429551 | primary | =====
2018-06-24 13:05:49.429680 | primary | Totals
2018-06-24 13:05:49.429728 | primary | =====
2018-06-24 13:05:49.429865 | primary | Ran: 1348 tests in 2464.0000 sec.
2018-06-24 13:05:49.429926 | primary | - Passed: 1291
2018-06-24 13:05:49.429982 | primary | - Skipped: 57
2018-06-24 13:05:49.430047 | primary | - Expected Fail: 0
2018-06-24 13:05:49.430121 | primary | - Unexpected Success: 0
2018-06-24 13:05:49.430174 | primary | - Failed: 0
2018-06-24 13:05:49.430293 | primary | Sum of execute time for each test: 5721.9955 sec.
2018-06-24 13:05:49.430323 | primary |
2018-06-24 13:05:49.430403 | primary | =====
2018-06-24 13:05:49.430461 | primary | Worker Balance
2018-06-24 13:05:49.430532 | primary | =====
2018-06-24 13:05:49.430639 | primary | - Worker 0 (295 tests) => 0:29:53.388981
2018-06-24 13:05:49.430743 | primary | - Worker 1 (374 tests) => 0:29:45.143005
2018-06-24 13:05:49.430847 | primary | - Worker 2 (352 tests) => 0:36:02.105966
2018-06-24 13:05:49.430951 | primary | - Worker 3 (327 tests) => 0:40:57.644190
```

# Система непрерывной интеграции на примере OpenStack CI



# Gating


- "управляемое слияние кода"
- слияния происходят **только** после успешных сборок
- основная ветка разработки всегда остается в рабочем состоянии

# Gating

- разработчики не имеют права на выполнение слияний
- сборка выполняется дважды: сразу после создания кодревью и перед слиянием
- все слияния кода выполняются системой CI, которая их предварительно *сериализует* (т.е. выстраивает в очередь)



# Кросс-проектные зависимости

All **My** Projects People DocumentationChanges Drafts Draft Comments Watched Changes Starred Changes GroupsChanges Search Roman Podoliaka




---

Change 575532 - Merged Reply... Included in Patch Sets (5/5) Download ☆

**Get rid of conditional rtplib\_fb imports**

Newer versions of this library have been out for awhile now and appear to be working well. This raises the minimum version for rtplib\_fb to a recent version that does not require the conditional import due to the namespace change from rtplib to rtplib\_fb.

Depends-on: <https://review.openstack.org/575530>  
Change-Id: I10f48833c2a61b7b2c6b300d4f8291a357f7e600

Author	Sean McGinnis <sean.mcginnis@gmail.com>	Jun 14, 2018 10:25 PM
Committer	Sean McGinnis <sean.mcginnis@gmail.com>	Jun 21, 2018 12:18 AM
Commit	f1e942fe8d202d751c4002eb1f9a35fd489b737e	 (gitweb)
Parent(s)	e396560f33cd97ca1609b19e7087f746983d5928	 (gitweb)
Change-Id	I10f48833c2a61b7b2c6b300d4f8291a357f7e600	

**Owner** Sean McGinnis

**Reviewers** Ivan Kolodyazhny Jay Bryant Yu Shengzuo Zuul

Cisco CI Cloudbase Cinder SMB3 CI Dell EMC VMAX CI Dell EMC VNX CI Fujitsu ETERNUS CI HPE Storage CI HPMSA CI Huawei FusionStorage CI IBM PowerKVM CI IBM Storage CI INFINIDAT CI INSPUR CI Kaminario K2 CI Lenovo Storage CI NEC Cinder CI NetApp CI NetApp E-Series CI Nexenta CI Nexenta Edge CI Oracle ZFSSA CI Quobyte CI SolidFire CI StorPool distributed storage CI Synology DSM CI VMware NSX CI Veritas Access CI Virtuozzo CI Virtuozzo Storage CI

**Project** openstack/cinder

**Branch** master

**Topic** rtplib

**Updated** 14 hours ago

Code-Review +2 Ivan Kolodyazhny Jay Bryant

Verified +2 Zuul

Workflow +1 Jay Bryant

<b>Zuul check</b>	Jun 21 1:55 AM
openstack-tox-pep8	SUCCESS in 8m 53s
openstack-tox-py27	SUCCESS in 9m 47s
openstack-tox-py35	SUCCESS in 8m 49s
build-openstack-sphinx-docs	SUCCESS in 6m 59s
requirements-check	SUCCESS in 4m 11s

# Кросс-проектные зависимости



Change 575530 - Merged

Reply...

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## Raise minimum for rtslib\_fb to 2.1.65

Prior to 2.1.52 this package's namespace was rtslib, then became rtslib\_fb. This results in cinder having conditional imports wherever this is used.

Newer versions have been out long enough now that we should be safe upgrading. Since there were a few blacklisted releases, this raises the minimum version past these known bad versions.

Change-Id: I5c3bd96ad5571d8c5a3a19d553bed03c9a1ec194

Owner	Sean McGinnis
Reviewers	Matthew Thode Tony Breeds Zuul
Project	openstack/requirements
Branch	master
Topic	rtslib_fb
Updated	9 days ago

Cherry Pick Revert

Code-Review +2 Matthew Thode Tony Breeds

Verified +2 Zuul

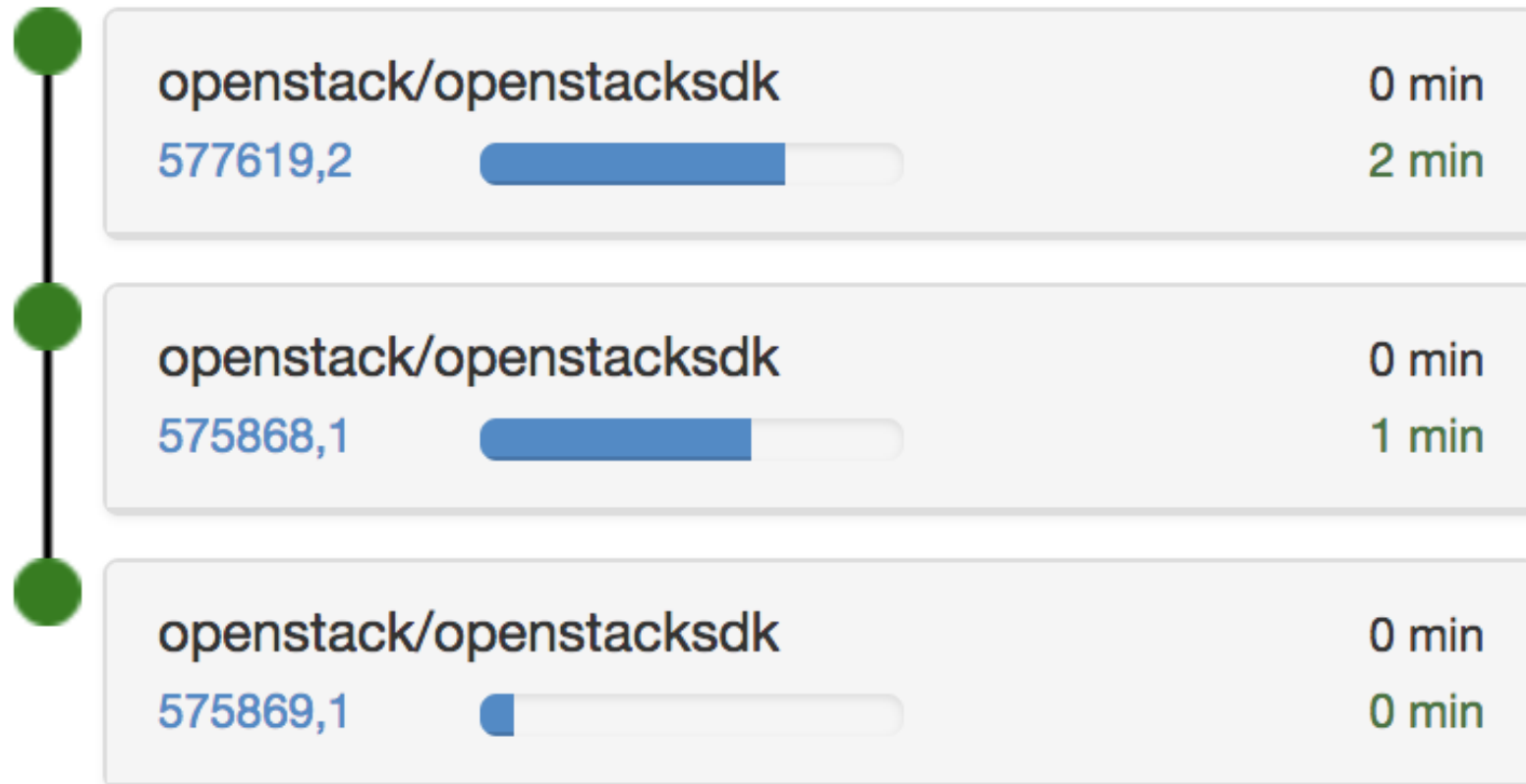
Workflow +1 Matthew Thode

Author	Sean McGinnis <sean.mcginis@gmail.com>	Jun 14, 2018 10:12 PM
Committer	Sean McGinnis <sean.mcginis@gmail.com>	Jun 14, 2018 10:24 PM
Commit	9c8da1570dd7190276423125e3397333043d8c07	(gitweb)
Parent(s)	044880d0ed6ec7b0f829a0454c09224d9ccc5ef6	(gitweb)
Change-Id	I5c3bd96ad5571d8c5a3a19d553bed03c9a1ec194	

Zuul check	Jun 15 4:25 AM
openstack-tox-pypy	SUCCESS in 4m 36s (non-voting)
build-openstack-sphinx-docs	SUCCESS in 5m 26s
openstack-tox-pep8	SUCCESS in 4m 49s
openstack-tox-py27	SUCCESS in 5m 43s
openstack-tox-py35	SUCCESS in 4m 03s

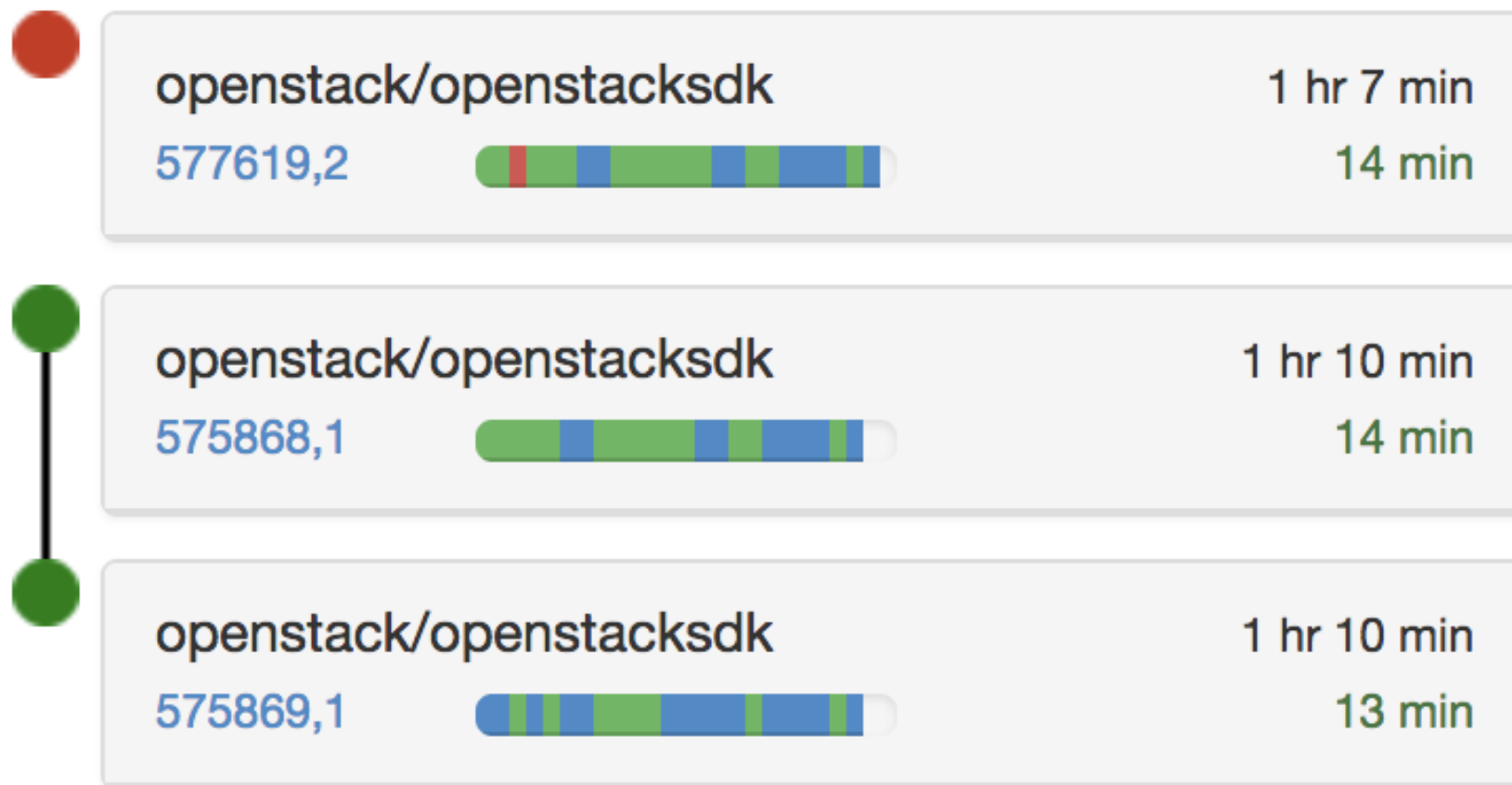
# Спекулятивный запуск сборок

Queue: openstack/openstacksdk



# Спекулятивный запуск сборок

Queue: openstack/openstacksdk



# Спекулятивный запуск сборок

## gate

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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



# Недостатки OpenStack CI

- сложность: не имеет смысла для небольших независимых проектов
- поддержка систем код-ревью, отличных от Gerrit, может быть "сырой"

# Выводы

- в наши дни система непрерывной интеграции - это неотъемлемый атрибут разработки программного обеспечения
- совместно с автоматизированными тестами CI позволяет повысить качество и надежность кода, скорость разработки, а также уверенность инженеров в результате своего труда
- в зависимости от размера и сложности проекта можно выбрать наиболее подходящий вариант построения системы непрерывной интеграции

# Ссылки

Детальное описание работы OpenStack CI:

<http://www.joinfu.com/2014/01/understanding-the-openstack-ci-system/>

Презентация о Zuul:

<https://www.youtube.com/watch?v=HlpJhqgGL34>

Michael Bayer (автор SQLAlchemy) о Gerrit:

<http://techspot.zzzeek.org/2016/04/21/gerrit-is-awesome/>



# Обратная связь

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