

OpenStack Community Activity Report
April-June, 2015
Report sponsored by the OpenStack Foundation



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This report would not exist without the effort of the people involved in the development of the OpenStack Activity Board, Grimoire toolset and the feedback of the people in the development mailing list of the OpenStack Foundation.

Executive Summary

The April-July 2015 summary of OpenStack Community Activity Report¹

Key findings:

External community keeps growing

With an increase of more than a 300% in the total number of questions posted in ask.openstack.org, this is the unique communication channels with such measured increase. Other channels such as IRC or mailing lists also grow but slower. Although this is the activity measured for the last year, the last quarter shows a significant activity drop.

Active Core Reviewers are increasing

Although mid-release cycle analysis usually show drops of activity in most of the areas, the total number of active core reviewers has reached a new peak. Up to 210 core reviewers participated in the review process. This shows an increase of more than a 10% if compared to the previous quarter analysis.

Process keeps stable The time to merge patches for the main projects show similar numbers than in previous quarter. However, Nova seems to be the project out of the common time to review with up to 10 days. On the other hand, Glance is more in line with the rest of the projects if compared to previous quarter. In any case, Glance shows the second highest median time to review with up to 7 days.

IRC activity recovers old activity

Due to unknown issues, the total logs analyzed in the last two previous quarters indicated a huge drop of activity. However, last analysis on this data source shows activity in line with previous quarters. Although this is still an unknown issue, the IRC activity has recovered expected activity.

¹This report is produced quarterly to give Community Managers and OpenStack Foundation's management better insights on development activities and online conversations. The quantitative and qualitative assessment start from tracking actions across all OpenStack git repositories, gerrit code reviews, bug trackers as well as IRC channels, mailing lists and questions/answers.

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Chapter 1

Overview of the Project

The OpenStack Community Activity Report is produced quarterly to give Community Managers and OpenStack Foundation’s management better insights on development activities and online conversations. The quantitative and qualitative assessment start from tracking actions across all OpenStack git repositories, gerrit code reviews, bug trackers as well as IRC channels, mailing lists and questions/answers site Ask OpenStack.

The report looks at activities across the OpenStack community during the second quarter of 2015, comparing it to previous eight quarters.¹.

The analysis aims at providing a detailed view of how the OpenStack project is evolving with special focus on each of the OpenStack project teams².

Data source	Activity 365 days	Change (wrt to prev. 365 days)
Gits	69105 commits	4%
Tickets	14153 closed tickets	30%
Mailing Lists	41523 sent emails	6%
Gerrit	64539 submitted reviews	19%
Askbot	5973 posted questions	343%
IRC	1696590 messages	1%

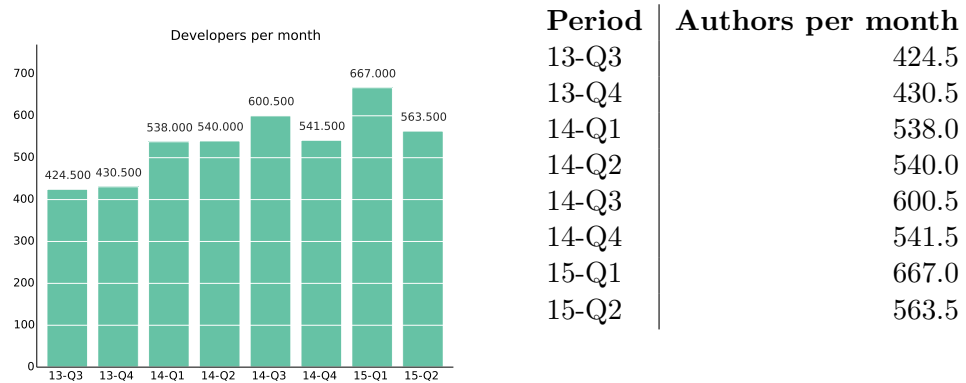
Table 1.1: Activity during the last 365 days and its evolution

The overall activity keeps increasing. Specifically in the case of the

¹The analyzed data sources are available in appendixB

²Each of the projects mentioned are following the analysis of the Projects specified at <http://git.openstack.org/cgit/openstack/governance/tree/reference/projects.yaml>. In addition, the hierarchy of projects and their repositories can be found at the correspondent appendixB

Askbot activity where the total number of questions have increased more than a 300%. On the other hand, development activity in terms of commits seems to keep stable as in previous reports. While Gerrit submissions have increased a 20% if compared to the previous 365 days.



In this second quarter of 2015 the mean number of developers active per month has reached a total of 563. It is observed a decrease if compared to the previous quarter. This is an usual behaviour of the community during the mid term releases cycle.

The total number of contributors divided into three sets (core, regular and casual³) follows a similar pattern. This mid term release cycle shows a decrease if compared to previous quarter. However this keeps increasing if compared to the previous mid term cycle (2014-Q4).

³Contributing developers are characterized as core, regular and casual depending on their activity in the git repositories. The classification is built by sorting contributors by their total number of commits; we sum the total commits per each individual contributors: the individuals whose commits sum up to 80% of the total number of commits in the quarter are the core contributors in that quarter. The regular contributors are those whose commits sum up to 95% of the total. The others are the casual contributors.

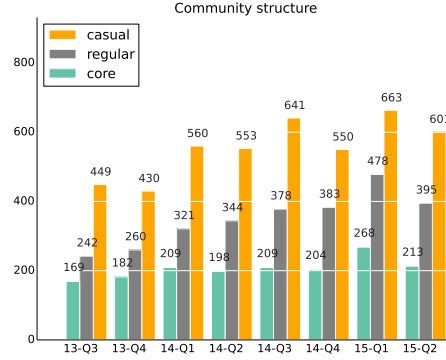


Figure 1.1: Evolution of the last 8 quarters of the core, regular and casual developers (Git activity)

Period	Core	Regular	Occasional
13-Q3	169	242	449
13-Q4	182	260	430
14-Q1	209	321	560
14-Q2	198	344	553
14-Q3	209	378	641
14-Q4	204	383	550
15-Q1	268	478	663
15-Q2	213	395	601

Table 1.2: Characterization of developers by their total contribution to the OpenStack projects

This report aims to provide some insights about the software development process of the OpenStack community measuring efficiency and process of the community based on three metrics: the Review Efficiency Index (REI), the Time to Merge (TTM), and the Backlog Management Index (BMI). REI is measured as the number of closed (merged or abandoned) changesets out of the submitted changesets in a given period. TTM is measured as the time since a review is submitted until this is closed. The BMI is measured as the number of closed tickets out of open tickets in a given period.

The median Time To Merge for Nova is a lot higher than in other project but the root cause of this is not clearly identifiable.

Integrated project	REI	BMI	TTM
neutron	0.76	0.65	4.42 days
sahara	0.81	0.72	4.75 days
ceilometer	0.79	0.68	4.01 days
horizon	0.74	0.71	3.09 days
heat	0.81	0.76	3.01 days
nova	0.59	0.53	10.7 days
trove	0.77	0.64	4.61 days
swift	0.65	0.45	5.81 days
glance	0.68	0.61	6.95 days
cinder	0.7	0.67	5.91 days
keystone	0.74	0.63	5.09 days

Table 1.3: Closed changesets out of opened changesets (REI), closed ticket out of opened tickets (BMI) and median time to merge in Gerrit (TTM)

1.1 Methodological Notes

Main changes with respect to previous reports are the following ones:

- Addition of new repositories: up to 100 of them. Most of them are part of new projects.
- Some of the projects that are detailed in the Governance file may not have a specific report in this analysis. This is due to their current migration under the *official OpenStack infrastructure*.
- Old nomenclature used to have a hierarchy of the projects is now renewed.
 - Client projects were usually under the 'Clients' chapter. However, each of the client files are now part of each of their correspondent projects.
 - Incubated and integrated sections in the main report has been removed. This nomenclature is not used any more.
 - *specs* files are not included in the analysis.
- Storyboard activity is not measured within this report.

Chapter 2

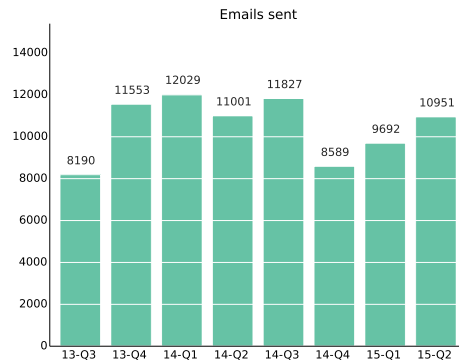
Communication and Support-Related Activities

The OpenStack community uses several channels for communication and support-related activities. Mailing lists were initially the key place for communications, although part of the activity is moving to the questions and answers tool in the Ask OpenStack site.

2.1 Mailing Lists

The following charts show activity in terms of emails sent, people sending emails and people initiating threads per quarter. In addition, two tables are presented with the hot topics in the several analyzed mailing lists. First table shows hot topics ordered by number of total posts in such thread, while the second table shows hot topics ordered by the total number of different participants in the discussions. The two tables are based on the last quarter period of activity.

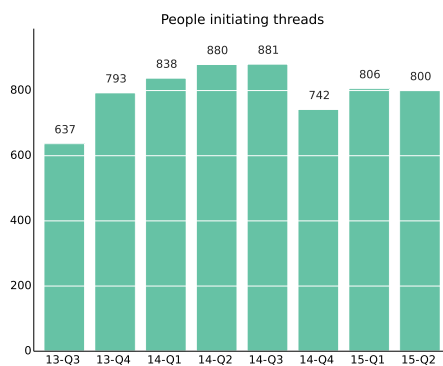
2.1. MAILING LISTS



Period	Emails
13-Q3	8190
13-Q4	11553
14-Q1	12029
14-Q2	11001
14-Q3	11827
14-Q4	8589
15-Q1	9692
15-Q2	10951



Period	People
13-Q3	983
13-Q4	1214
14-Q1	1287
14-Q2	1351
14-Q3	1337
14-Q4	1189
15-Q1	1267
15-Q2	1279



Period	People
13-Q3	637
13-Q4	793
14-Q1	838
14-Q2	880
14-Q3	881
14-Q4	742
15-Q1	806
15-Q2	800

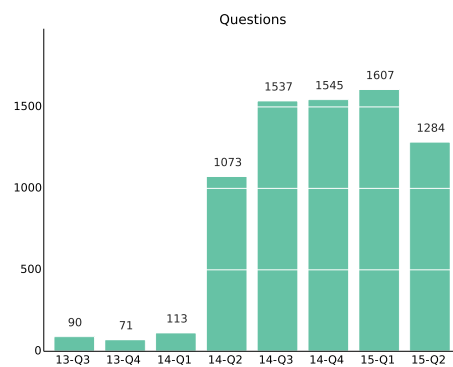
Initial Author and Date	Subject	Number Messages
jaypipes 2015-06-15	[openstack-dev] [api][nova][ironic] Microver- sion API HTTP header	64
Nikola Dipanov 2015-06-24	[openstack-dev] [Nova] The unbearable lightness of specs	62
Angus Salkeld 2015-04-07	[openstack-dev] [all] how to send messages (and events) to our users	51
filip-blaha 2015-05-06	[openstack-dev] [Murano] [Mistral] SSH workflow action	50
Neil.Jerram@metaswitch.com 2015-04-08	[openstack-dev] [neutron] Neutron scaling datapoints?	48
Russell Bryant 2015-04-22	[openstack-dev] [Neutron] A big tent home for Neutron backend code	47
hejie.xu@intel.com 2015-06-04	[openstack-dev] [api] [Nova] [Ironi] [Magnum] Microver- sion guideline in API-WG	46
Chris Dent 2015-04-23	[openstack-dev] [all] Question for the TC candidates	43
yngvith@siminn.is 2015-06-26	[Openstack] error creating in- stance	42
Joe Gordon 2015-05-11	[openstack-dev] [nova][all] Ar- chitecture Diagrams in ascii art?	42

Initial Author and Date	Subject	Diff. People
John Garbutt 2015-06-25	[openstack-dev] [Nova] The unbearable lightness of specs	26
jaypipes 2015-04-24	[openstack-dev] Please stop reviewing code while asking questions	25
Dolph Mathews 2015-06-15	[openstack-dev] [api][nova][ironic] Microversion API HTTP header	24
Marco.Fargetta@ct.infn.it 2015-05-12	[openstack-dev] [nova][all] Architecture Diagrams in ascii art?	24
Dean Troyer 2015-04-24	[openstack-dev] [all] Question for the TC candidates	23
Salvatore Orlando 2015-06-03	[openstack-dev] [all][infra][tc][ptl] Scaling up code review process (subdir cores)	19
hejie.xu@intel.com 2015-06-05	[openstack-dev] [api] [Nova] [Ironic] [Magnum] Microversion guideline in API-WG	17
ArkadyKanevsky 2015-05-26	[openstack-dev] [cinder] Some Changes to Cinder Core	17
Kyle Mestery 2015-04-23	[openstack-dev] [Neutron] A big tent home for Neutron backend code	16
Gordon Chung 2015-04-07	[openstack-dev] [all] how to send messages (and events) to our users	16

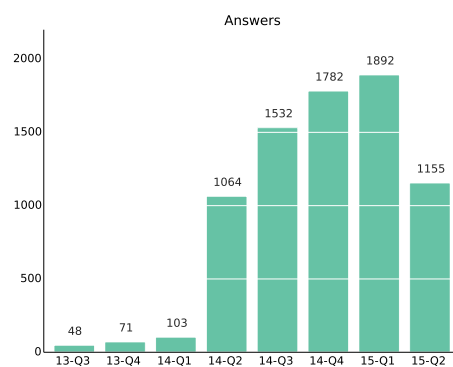
2.2 Questions and Answers

The following charts show activity in the Ask OpenStack site. Total number of questions, number of answers, number of comments and people sending

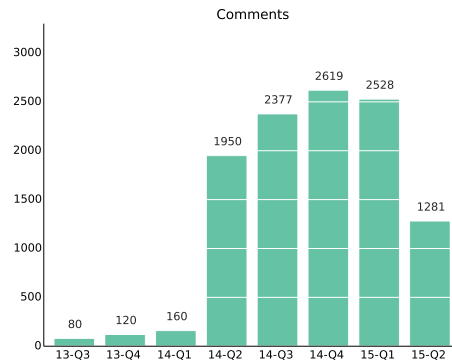
questions are depicted. In addition four tables represent the hot topics activity in the Ask OpenStack site. Those show information about the top visited questions, questions with the highest number of comments, questions with the highest number of different people participating and the tags with the highest number of references.



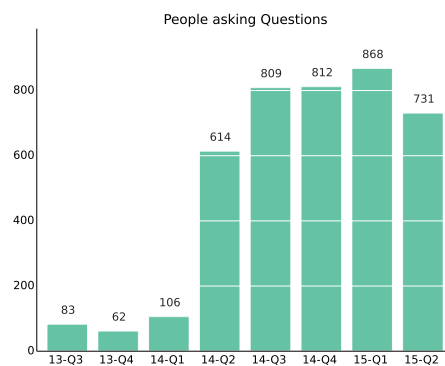
Period	Questions
13-Q3	90
13-Q4	71
14-Q1	113
14-Q2	1073
14-Q3	1537
14-Q4	1545
15-Q1	1607
15-Q2	1284



Period	Answers
13-Q3	48
13-Q4	71
14-Q1	103
14-Q2	1064
14-Q3	1532
14-Q4	1782
15-Q1	1892
15-Q2	1155



Period	Comments
13-Q3	80
13-Q4	120
14-Q1	160
14-Q2	1950
14-Q3	2377
14-Q4	2619
15-Q1	2528
15-Q2	1281



Period	People asking
13-Q3	83
13-Q4	62
14-Q1	106
14-Q2	614
14-Q3	809
14-Q4	812
15-Q1	868
15-Q2	731

- Top visited questions.

Question subject

no log or console for instance+
 kilo heat topo view in horizon+
 new kilo instance launch dialogue stays+
 rdo kilo novalidhost no valid host+
 kilo on centos7 keystone throws http+
 switching from vnc to spice console+
 how many mutiple nics can be+
 is there any mechanism to provide+
 how can i deploy multi node+
 error unable to connect to neutron+

Visits

57728
 791
 584
 525
 521
 390
 353
 329
 323
 318

- Top questions with more comments.

Question subject	Comments
how can i assign public ips+	5
dhcp discover requests not answered+	5
instance private ip not pingable+	5
add another compute host to junos+	5
why doesnt openstack free resources when+	5
error unable to connect to neutron+	5
rdo kilo novalidhost no valid host+	5
alternative to unnumbered interface+	5
nova docker arm error cannot setup+	5
when instance is rebooted instance interface+	5

- Top questions with the highest number of different people participating.

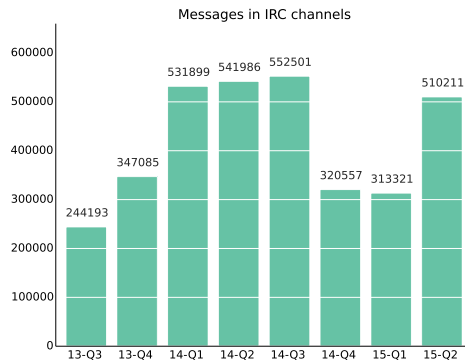
Question subject	People participating
cant create or delete instances+	7
no valid host was found+	7
error unable to connect to neutron+	7
kilo on centos7 keystone throws http+	7
unable ping google from instance+	6
maximum amount of instances deployed at+	6
migration from older releases to kilo+	5
accessing the vm from internet+	5
keystone socket error errno 98 address+	5
cirros instance cannot get ip address+	5

- Top tags

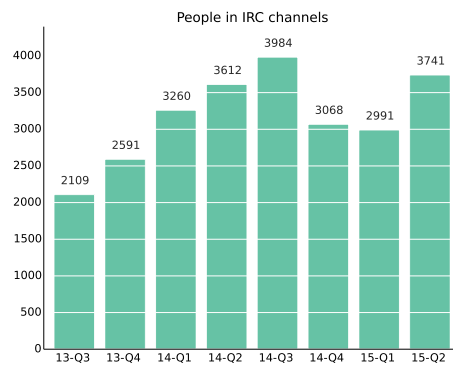
Tag name	Ocurrences
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2.3 IRC

Finally, the community of OpenStack uses several IRC channels for asynchronous communication. This section shows information about the total number of messages sent in the community during the last 8 quarters together with the number of the several people participating in such discussions. In addition, a list with the top participants in the IRC channels is provided.



Period	Messages
13-Q3	244193
13-Q4	347085
14-Q1	531899
14-Q2	541986
14-Q3	552501
14-Q4	320557
15-Q1	313321
15-Q2	510211



Period	People
13-Q3	2109
13-Q4	2591
14-Q1	3260
14-Q2	3612
14-Q3	3984
14-Q4	3068
15-Q1	2991
15-Q2	3741

IRC id	Messages sent
morganfainberg	8598
openstack	7343
Jeremy Stanley	7219
sdake	6333
Monty Taylor	6237
rbtcollins	5374
ayoung	5084
clarkb	4933
Matt Riedemann	4824
Thierry Carrez	4811
Sean Dague	4807
Anita Kuno	4549
Lucas Alvares Gomes	4374
jgriffith	4273
dhellmann	4107

Chapter 3

Details on OpenStack Software

Each breakdown is divided into three sections with information from the last eight quarters:

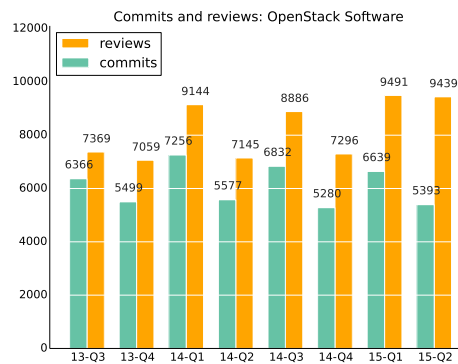
- activity: centered in the following metrics: commits from git activity, submitted, merge and abandoned reviews from the review system and opened and closed tickets from the issue tracking system.
- community: active core reviewers in gerrit, active authors in git and top ten developers and top ten organizations contributing to the development in the last quarter. of each project.
- process: efficiency closing tickets, efficiency closing changesets, Time to Merge (mean and median), number of patchsets (iterations) per changeset and study on the time waiting for a reviewer or submitter action in the patchset review process.

Details on individual OpenStack project teams are provided in separate documents on git.openstack.org/cgit/openstack-infra/activity-board/tree/reports/2015-q

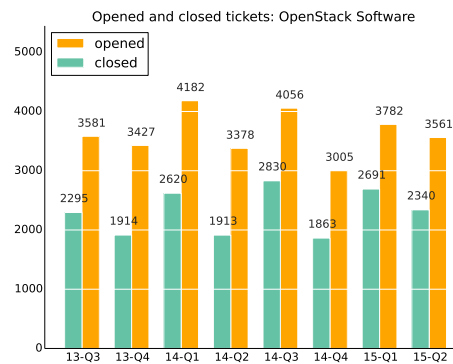
3.1 Overview of OpenStack Project Teams

3.2 Activity

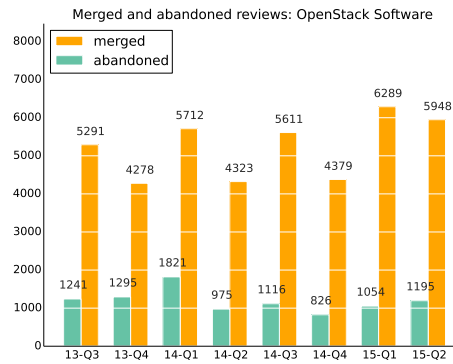
Commits in Git, submitted, merged and abandoned reviews in Gerrit and opened and closed issues in Launchpad.



Period	Commits	Reviews
13-Q3	6366	7369
13-Q4	5499	7059
14-Q1	7256	9144
14-Q2	5577	7145
14-Q3	6832	8886
14-Q4	5280	7296
15-Q1	6639	9491
15-Q2	5393	9439



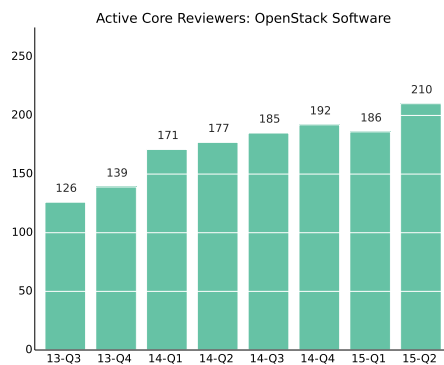
Period	Closed	Opened
13-Q3	2295	3581
13-Q4	1914	3427
14-Q1	2620	4182
14-Q2	1913	3378
14-Q3	2830	4056
14-Q4	1863	3005
15-Q1	2691	3782
15-Q2	2340	3561



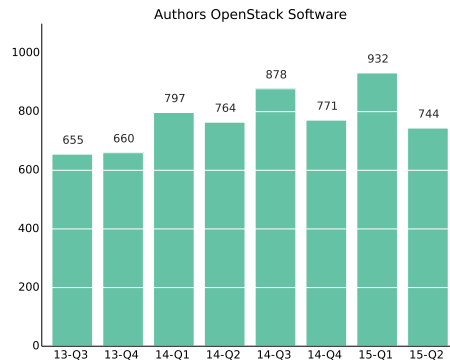
Period	Merged	Abandoned
13-Q3	5291	1241
13-Q4	4278	1295
14-Q1	5712	1821
14-Q2	4323	975
14-Q3	5611	1116
14-Q4	4379	826
15-Q1	6289	1054
15-Q2	5948	1195

3.3 Community

Active core reviewers in Gerrit, active authors in Git, top authors and organizations in the last quarter



Period	Active Core
13-Q3	126
13-Q4	139
14-Q1	171
14-Q2	177
14-Q3	185
14-Q4	192
15-Q1	186
15-Q2	210



Period	Authors
13-Q3	655
13-Q4	660
14-Q1	797
14-Q2	764
14-Q3	878
14-Q4	771
15-Q1	932
15-Q2	744

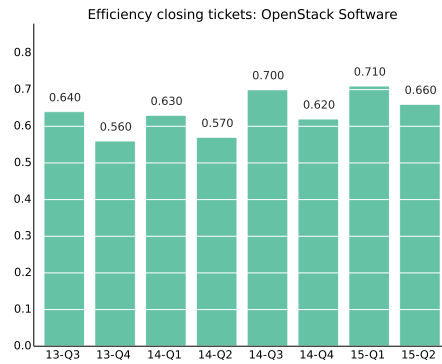
Commit (s)	Author
185	Emilien Macchi
135	Jeremy Stanley
121	Colleen Murphy
105	Mark Vanderwiel
102	Doug Hellmann
86	Victor Stinner
78	Jamie Lennox
75	Brant Knudson
67	Nikolay Mahotkin
62	Kevin Benton

Commit (s)	Organizations
1061	Red Hat
661	Mirantis
655	IBM
581	HP
258	Rackspace
186	OpenStack Foundation
148	Huawei
126	Puppet Labs
123	Intel
96	Cisco Systems

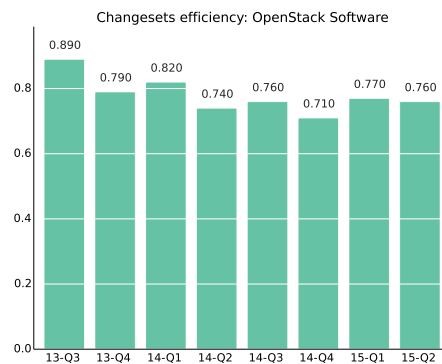
3.4 Process

Efficiency closing changesets and tickets, time to review (mean and median), number of patchsets (iterations) per changeset and study on the time waiting for a reviewer or submitter action in the patchset review process.

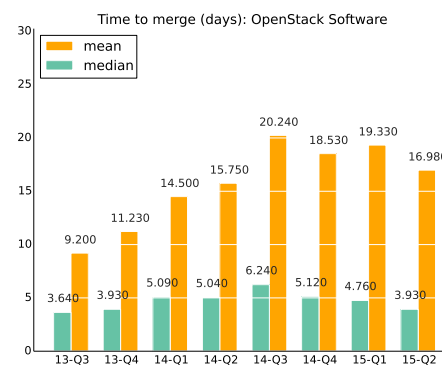
3.4. PROCESS



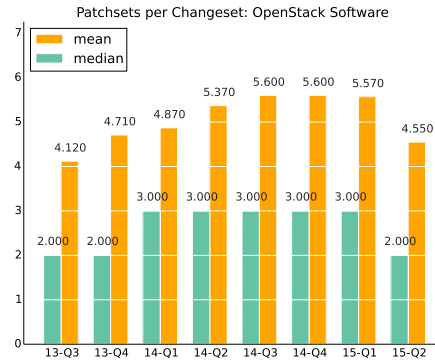
Period	Closed/Opened
13-Q3	0.64
13-Q4	0.56
14-Q1	0.63
14-Q2	0.57
14-Q3	0.7
14-Q4	0.62
15-Q1	0.71
15-Q2	0.66



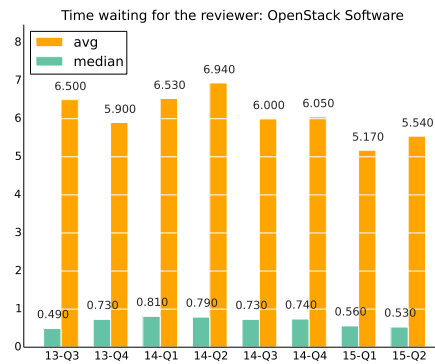
Period	(Aband. and Merg.)/Subm.
13-Q3	0.89
13-Q4	0.79
14-Q1	0.82
14-Q2	0.74
14-Q3	0.76
14-Q4	0.71
15-Q1	0.77
15-Q2	0.76



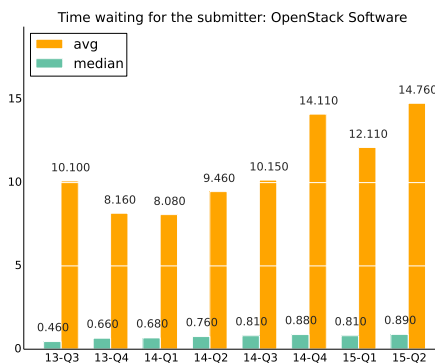
Period	Median	Mean
13-Q3	3.64	9.2
13-Q4	3.93	11.23
14-Q1	5.09	14.5
14-Q2	5.04	15.75
14-Q3	6.24	20.24
14-Q4	5.12	18.53
15-Q1	4.76	19.33
15-Q2	3.93	16.98



Period	Median	Mean
13-Q3	2.0	4.12
13-Q4	2.0	4.71
14-Q1	3.0	4.87
14-Q2	3.0	5.37
14-Q3	3.0	5.6
14-Q4	3.0	5.6
15-Q1	3.0	5.57
15-Q2	2.0	4.55



Period	Median	Mean
13-Q3	0.49	6.5
13-Q4	0.73	5.9
14-Q1	0.81	6.53
14-Q2	0.79	6.94
14-Q3	0.73	6.0
14-Q4	0.74	6.05
15-Q1	0.56	5.17
15-Q2	0.53	5.54



Period	Median	Mean
13-Q3	0.46	10.1
13-Q4	0.66	8.16
14-Q1	0.68	8.08
14-Q2	0.76	9.46
14-Q3	0.81	10.15
14-Q4	0.88	14.11
15-Q1	0.81	12.11
15-Q2	0.89	14.76

Appendix A

Metrics Definitions

Metrics measured in each OpenStack program:

- Commit: this is defined as the action(s) that performs a change in the source code. Bots, merges and other type of automatic activity is removed from the records. In addition, when aggregating several git repositories, this metric only counts unique revisions (unique hashes found in the git repositories). Finally, all branches are aggregated to the analysis.
- Submitted changeset: a changeset is the process of peer reviewing source code changes. A commit is not merged to the master code of a given project till this is approved for at least one core reviewer of such project. A submitted changeset is defined as any changeset submitted to the Gerrit system. However, given the limitations of the current version of the tool, with at least 5,900 changesets detected as having an erroneous creation date, this metric counts the first patchset upload action.
- Merged and abandoned changsets: a merge is defined as the patchset that was finally submitted to the source code. An abandoned changeset is a potential merge that was finally dismissed by developers as being part of the source code. This status is found in the status of the final patchset. However, although a patchset can be merged or abandoned, this action can be reverted. If a patchset presents several of these changes in the same period of time, only one of them is counted (the very last one). On the other hand, if those changes take place in different periods of analysis, both status would be counted.

- Open and closed ticket: a ticket in Launchpad is counted as closed if the status of such ticket is defined as 'Fix Released'. The rest of the tickets are counted as opened tickets.
- Active Core Reviewer: a core reviewer has the possibility to use +2 or -2 actions when reviewing the code. However, if there are developers that for some period do not use those actions, those can not be measured as core reviewer. Thus, this metric provides information about 'active' core reviewers. This can be also defined as those developers that actively have used the +2 or -2 review action. This metric is also filtered by branch of activity, only using 'master'. This helps to detect actual core reviewers in each of the projects.
- Authors: a developer is defined as author if she is the owner of the patchset sent for reviewing and this is merged into the source code. As previously indicated, automatic commits such bot's are removed from this analysis.
- Efficiency closing issues: this metric is a derivation of the Backlog Management Index (BMI) that measures the number of closed tickets out of the opened tickets in a period of time. Values under 1.0 indicates that the number of closing issues is lower than the number of opened issues arriving. On the contrary, higher charts would indicate better maintenance effort by the community.
- Efficiency closing changesets: this metric is a derivation of the Backlog Management Index as it is named as Review efficiency index (REI). As similarly used in the BMI index, this metrics measures the number of closed changesets (merged or abandoned) out of the total number of new changesets.
- Time to Merge: this time consists of the time between the first upload of the first patchset (as defined as a submitted changeset) till the last patchset of the changeset is merged into the code and this is indicated in the comments side of the Gerrit tool. This metric is provided in number of days.
- Patchsets per changeset: this metric calculates the total number of iterations in a changeset till this is abandoned or merged.
- Time waiting for the reviewer or the submitter: a changeset is waiting for a reviewer action if a new patchset upload or a new changset arrives

to the system. On the other hand, a submitter action is required when a specific negative verification or reviewing action takes place (Verified -1/-2 or Code-Review -1/-2). In addition, when a Code-Review +2 action takes place, it is assumed that the changset is closing and no more times are registered either for the reviewer or the submitter. For this analysis, those patchsets flagged as work in progress are ignored.

Metrics measured in the general overview:

- Community structure, core, regular and casual developers: developers are ordered in descendant order by the number of commits authored for a given period. Core developers are defined as the list of developers that reach 80% of the total commits. Regular is the set of developers that are between that 80% and 95% of the commits. Casual developers are found in the rest of the 5%. Bots are ignored in this list of developers.
- Developer per month: average of developers per month ignoring bots.
- Emails sent: number of emails sent by people to the several mailing lists. Bots are not registered.
- People sending emails: number of people sending those emails ignoring bots.
- People initiating threads: a thread is defined as a list of emails that has the same root. There may exist threads of one email.
- Top threads: this list provides the longest threads in terms of number of emails that have a common root email.
- Questions, answers and comments in Askbot.
- People asking questions in Askbot: number of people sending a new question.
- Top visited questions.
- Top tags: each of the questions has a list of associated tags. The top tags are those with the highest number of repetitions aggregating all of the questions.
- Messages and people in IRC: this analysis ignores as a message those entries in the IRC channels that provide information about people entering or leaving the system.

Appendix B

Source Code and Data Sources

The data source used to provide the data of this analysis can be found at the GrimoireLib library. Specifically the `openstack_report.py` file¹.

With respect to the list of analyzed repositories per project, the following table lists all of them. There are three data sources: git activity (scm), tickets activity (its) and review activity (scr). This information is based on the information listed in the yaml organizational file² provided by the OpenStack Foundation.

Program	Data source	Repository
barbican	its	https://bugs.launchpad.net/barbican
barbican	scm	git://git.openstack.org/openstack/python-barbicanclient
barbican	scm	git://git.openstack.org/openstack/barbican
barbican	scm	git://git.openstack.org/openstack/castellan
barbican	scm	git://git.openstack.org/openstack/kite
barbican	scm	git://git.openstack.org/openstack/python-kiteclient
barbican	scr	review.openstack.org_openstack/barbican
barbican	scr	review.openstack.org_openstack/python-kiteclient
barbican	scr	review.openstack.org_openstack/python-barbicanclient
barbican	scr	review.openstack.org_openstack/castellan
barbican	scr	review.openstack.org_openstack/kite

¹https://github.com/VizGrimoire/GrimoireLib/blob/master/vizGrimoireJS/openstack_report.py. Commit identified with the hash `d33b6f5951662fb5bd895eee89c0b0344b09c956`

²<http://git.openstack.org/cgit/openstack/governance/tree/reference/projects.yaml>

ceilometer	its	https://bugs.launchpad.net/ceilometer
ceilometer	its	https://bugs.launchpad.net/python-ceilometerclient
ceilometer	scm	https://github.com/openstack/python-ceilometerclient.git
ceilometer	scm	https://github.com/openstack/ceilometer.git
ceilometer	scr	review.openstack.org_openstack/python-ceilometerclient
ceilometer	scr	review.openstack.org_openstack/ceilometer
ChefOpenStack	its	https://bugs.launchpad.net/openstack-chef
ChefOpenStack	scm	git://git.openstack.org/openstack/cookbook-openstack-common
ChefOpenStack	scm	git://git.openstack.org/openstack/cookbook-openstack-identity
ChefOpenStack	scm	git://git.openstack.org/openstack/cookbook-openstack-ops-messaging
ChefOpenStack	scm	git://git.openstack.org/openstack/cookbook-openstack-block-storage
ChefOpenStack	scm	git://git.openstack.org/openstack/cookbook-openstack-data-processing
ChefOpenStack	scm	git://git.openstack.org/openstack/cookbook-openstack-network
ChefOpenStack	scm	git://git.openstack.org/openstack/cookbook-openstack-telemetry
ChefOpenStack	scm	git://git.openstack.org/openstack/cookbook-openstack-compute
ChefOpenStack	scm	git://git.openstack.org/openstack/cookbook-openstack-image
ChefOpenStack	scm	git://git.openstack.org/openstack/cookbook-openstack-ops-database
ChefOpenStack	scm	git://git.openstack.org/openstack/cookbook-openstack-client
ChefOpenStack	scm	git://git.openstack.org/openstack/cookbook-openstack-database
ChefOpenStack	scm	git://git.openstack.org/openstack/cookbook-openstack-object-storage
ChefOpenStack	scm	git://git.openstack.org/openstack/openstack-chef-repo
ChefOpenStack	scm	git://git.openstack.org/openstack/cookbook-openstack-bare-metal
ChefOpenStack	scm	git://git.openstack.org/openstack/cookbook-openstack-dashboard
ChefOpenStack	scm	git://git.openstack.org/openstack/cookbook-openstack-integration-test

ChefOpenStack	scm	git://git.openstack.org/openstack/cookbook-openstack-orchestration
ChefOpenStack	scr	review.openstack.org_openstack/cookbook-openstack-ops-database
ChefOpenStack	scr	review.openstack.org_openstack/cookbook-openstack-block-storage
ChefOpenStack	scr	review.openstack.org_openstack/cookbook-openstack-client
ChefOpenStack	scr	review.openstack.org_openstack/cookbook-openstack-database
ChefOpenStack	scr	review.openstack.org_openstack/cookbook-openstack-object-storage
ChefOpenStack	scr	review.openstack.org_openstack/openstack-chef-repo
ChefOpenStack	scr	review.openstack.org_openstack/cookbook-openstack-dashboard
ChefOpenStack	scr	review.openstack.org_openstack/cookbook-openstack-integration-test
ChefOpenStack	scr	review.openstack.org_openstack/cookbook-openstack-orchestration
ChefOpenStack	scr	review.openstack.org_openstack/cookbook-openstack-common
ChefOpenStack	scr	review.openstack.org_openstack/cookbook-openstack-identity
ChefOpenStack	scr	review.openstack.org_openstack/cookbook-openstack-ops-messaging
ChefOpenStack	scr	review.openstack.org_openstack/cookbook-openstack-bare-metal
ChefOpenStack	scr	review.openstack.org_openstack/cookbook-openstack-data-processing
ChefOpenStack	scr	review.openstack.org_openstack/cookbook-openstack-network
ChefOpenStack	scr	review.openstack.org_openstack/cookbook-openstack-telemetry
ChefOpenStack	scr	review.openstack.org_openstack/cookbook-openstack-compute
ChefOpenStack	scr	review.openstack.org_openstack/cookbook-openstack-image
cinder	its	https://bugs.launchpad.net/python-cinderclient
cinder	its	https://bugs.launchpad.net/cinder
cinder	scm	https://github.com/openstack/python-cinderclient.git
cinder	scm	https://github.com/openstack/cinder.git
cinder	scr	review.openstack.org_openstack/python-cinderclient

cinder	scr	review.openstack.org_openstack/cinder
Common Libraries	its	https://bugs.launchpad.net/oslo.config
Common Libraries	its	https://bugs.launchpad.net/oslo.middleware
Common Libraries	its	https://bugs.launchpad.net/oslo.versionedobjects
Common Libraries	its	https://bugs.launchpad.net/stevedore
Common Libraries	its	https://bugs.launchpad.net/pbr
Common Libraries	its	https://bugs.launchpad.net/oslo.cache
Common Libraries	its	https://bugs.launchpad.net/oslo.i18n
Common Libraries	its	https://bugs.launchpad.net/oslo.serialization
Common Libraries	its	https://bugs.launchpad.net/oslotest
Common Libraries	its	https://bugs.launchpad.net/hacking
Common Libraries	its	https://bugs.launchpad.net/oslo.context
Common Libraries	its	https://bugs.launchpad.net/oslo.policy
Common Libraries	its	https://bugs.launchpad.net/oslo.wmware
Common Libraries	its	https://bugs.launchpad.net/tooz
Common Libraries	its	https://bugs.launchpad.net/taskflow
Common Libraries	its	https://bugs.launchpad.net/oslo.concurrency
Common Libraries	its	https://bugs.launchpad.net/oslo.log
Common Libraries	its	https://bugs.launchpad.net/oslo.utils
Common Libraries	its	https://bugs.launchpad.net/pylockfile
Common Libraries	its	https://bugs.launchpad.net/oslo.messaging
Common Libraries	its	https://bugs.launchpad.net/oslo.db
Common Libraries	its	https://bugs.launchpad.net/oslo.rootwrap
Common Libraries	its	https://bugs.launchpad.net/oslosphinx
Common Libraries	scm	git://git.openstack.org/openstack/debtcollector
Common Libraries	scm	git://git.openstack.org/openstack/oslo.policy
Common Libraries	scm	git://git.openstack.org/openstack/oslo.vmware
Common Libraries	scm	git://git.openstack.org/openstack-dev/oslo-cookiecutter
Common Libraries	scm	git://git.openstack.org/openstack/stevedore
Common Libraries	scm	https://github.com/openstack/oslo.version.git
Common Libraries	scm	git://git.openstack.org/openstack/oslo.db
Common Libraries	scm	git://git.openstack.org/openstack/oslo.log
Common Libraries	scm	git://git.openstack.org/openstack/oslo.utils
Common Libraries	scm	git://git.openstack.org/openstack/oslo.context
Common Libraries	scm	git://git.openstack.org/openstack/oslosphinx
Common Libraries	scm	https://github.com/openstack/oslo.config.git
Common Libraries	scm	git://git.openstack.org/openstack/oslo.cache
Common Libraries	scm	git://git.openstack.org/openstack/oslo.rootwrap
Common Libraries	scm	git://git.openstack.org/openstack/oslo.i18n
Common Libraries	scm	git://git.openstack.org/openstack/oslotest

Common Libraries	scm	git://git.openstack.org/openstack/oslo.rootwrap
Common Libraries	scm	git://git.openstack.org/openstack/taskflow
Common Libraries	scm	git://git.openstack.org/openstack/oslo.middleware
Common Libraries	scm	git://git.openstack.org/openstack/oslo.versionedobjects
Common Libraries	scm	git://git.openstack.org/openstack/oslo.concurrency
Common Libraries	scm	git://git.openstack.org/openstack/pycadf
Common Libraries	scm	https://github.com/openstack/oslo.messaging.git
Common Libraries	scm	git://git.openstack.org/openstack/oslo.config
Common Libraries	scm	git://git.openstack.org/openstack/oslo.serialization
Common Libraries	scm	git://git.openstack.org/openstack/tooz
Common Libraries	scm	git://git.openstack.org/openstack/pylockfile
Common Libraries	scm	git://git.openstack.org/openstack/oslo.vmware
Common Libraries	scm	https://github.com/openstack/oslo-incubator.git
Common Libraries	scr	review.openstack.org_openstack/oslo.i18n
Common Libraries	scr	review.openstack.org_openstack/tooz
Common Libraries	scr	review.openstack.org_openstack/oslo.log
Common Libraries	scr	review.openstack.org_openstack/oslo.serialization
Common Libraries	scr	review.openstack.org_openstack/oslotest
Common Libraries	scr	review.openstack.org_openstack/debtcollector
Common Libraries	scr	review.openstack.org_openstack/oslo.policy
Common Libraries	scr	review.openstack.org_openstack/oslo-incubator
Common Libraries	scr	review.openstack.org_openstack/oslo.vmware
Common Libraries	scr	review.openstack.org_openstack/taskflow
Common Libraries	scr	review.openstack.org_openstack/oslo.context
Common Libraries	scr	review.openstack.org_openstack/oslo.messaging
Common Libraries	scr	review.openstack.org_openstack-dev/hacking
Common Libraries	scr	review.openstack.org_openstack/oslo.utils
Common Libraries	scr	review.openstack.org_openstack/pylockfile
Common Libraries	scr	review.openstack.org_openstack/oslo.db
Common Libraries	scr	review.openstack.org_openstack/oslo.cache
Common Libraries	scr	review.openstack.org_openstack/oslo.rootwrap
Common Libraries	scr	review.openstack.org_openstack/oslo.config
Common Libraries	scr	review.openstack.org_openstack/oslosphinx
Common Libraries	scr	review.openstack.org_openstack/oslo.concurrency
Common Libraries	scr	review.openstack.org_openstack/oslo.middleware
Common Libraries	scr	review.openstack.org_openstack-dev/pbr
Common Libraries	scr	review.openstack.org_openstack/oslo.versionedobjects
Common Libraries	scr	review.openstack.org_openstack/stevedore
Deployment	its	https://bugs.launchpad.net/os-net-config
Deployment	its	https://bugs.launchpad.net/python-tuskarclient

Deployment	its	https://bugs.launchpad.net/os-cloud-config
Deployment	its	https://bugs.launchpad.net/diskimage-builder
Deployment	its	https://bugs.launchpad.net/os-refresh-config
Deployment	its	https://bugs.launchpad.net/tuskar
Deployment	its	https://bugs.launchpad.net/os-collect-config
Deployment	its	https://bugs.launchpad.net/os-apply-config
Deployment	scm	git://git.openstack.org/openstack/os-apply-config
Deployment	scm	git://git.openstack.org/openstack/tuskar
Deployment	scm	git://git.openstack.org/openstack/tripleo-puppet-elements
Deployment	scm	git://git.openstack.org/openstack/os-refresh-config
Deployment	scm	https://github.com/openstack/tripleo-incubator.git
Deployment	scm	git://git.openstack.org/openstack/dib-utils
Deployment	scm	git://git.openstack.org/openstack/os-cloud-config
Deployment	scm	https://github.com/openstack/tripleo-heat-templates.git
Deployment	scm	git://git.openstack.org/openstack/python-tuskarclient
Deployment	scm	git://git.openstack.org/openstack/os-net-config
Deployment	scm	git://git.openstack.org/openstack/os-collect-config
Deployment	scm	https://github.com/openstack/tripleo-image-elements.git
Deployment	scm	git://git.openstack.org/openstack/diskimage-builder
Deployment	scr	review.openstack.org_openstack/os-apply-config
Deployment	scr	review.openstack.org_openstack/tripleo-heat-templates
Deployment	scr	review.openstack.org_openstack/os-net-config
Deployment	scr	review.openstack.org_openstack/os-refresh-config
Deployment	scr	review.openstack.org_openstack/tuskar
Deployment	scr	review.openstack.org_openstack/os-cloud-config
Deployment	scr	review.openstack.org_openstack/tripleo-image-elements
Deployment	scr	review.openstack.org_openstack/dib-utils
Deployment	scr	review.openstack.org_openstack/diskimage-builder
Deployment	scr	review.openstack.org_openstack/python-tuskarclient
Deployment	scr	review.openstack.org_openstack/tripleo-puppet-elements
Deployment	scr	review.openstack.org_openstack/os-collect-config
Deployment	scr	review.openstack.org_openstack/tripleo-incubator
designate	its	https://bugs.launchpad.net/designate
designate	its	https://bugs.launchpad.net/python-designateclient
designate	scm	git://git.openstack.org/openstack/designate
designate	scm	git://git.openstack.org/openstack/python-designateclient
designate	scr	review.openstack.org_stackforge/python-designateclient
designate	scr	review.openstack.org_openstack/designate
Documentation	its	https://bugs.launchpad.net/openstack-manuals
Documentation	its	https://bugs.launchpad.net/openstack-api-site

Documentation	scm	git://git.openstack.org/openstack/openstackdocstheme
Documentation	scm	https://github.com/openstack/image-api.git
Documentation	scm	https://github.com/openstack/compute-api.git
Documentation	scm	https://github.com/openstack/openstack-manuals.git
Documentation	scm	git://git.openstack.org/openstack/ha-guide
Documentation	scm	git://git.openstack.org/openstack/operations-guide
Documentation	scm	https://github.com/openstack/netconn-api.git
Documentation	scm	git://git.openstack.org/openstack/training-guides
Documentation	scm	git://git.openstack.org/openstack/security-doc
Documentation	scm	https://github.com/openstack/identity-api.git
Documentation	scm	https://github.com/openstack/volume-api.git
Documentation	scm	git://git.openstack.org/openstack/openstack-doc-tools
Documentation	scm	https://github.com/openstack/api-site.git
Documentation	scm	https://github.com/openstack/object-api.git
Documentation	scr	review.openstack.org_openstack/ha-guide
Documentation	scr	review.openstack.org_openstack/api-site
Documentation	scr	review.openstack.org_openstack/object-api
Documentation	scr	review.openstack.org_openstack/training-guides
Documentation	scr	review.openstack.org_openstack/openstack-doc-tools
Documentation	scr	review.openstack.org_openstack/security-doc
Documentation	scr	review.openstack.org_openstack/image-api
Documentation	scr	review.openstack.org_openstack/volume-api
Documentation	scr	review.openstack.org_openstack/compute-api
Documentation	scr	review.openstack.org_openstack/openstack-manuals
Documentation	scr	review.openstack.org_openstack/openstackdocstheme
Documentation	scr	review.openstack.org_openstack/netconn-api
Documentation	scr	review.openstack.org_openstack/identity-api
Documentation	scr	review.openstack.org_openstack/operations-guide
glance	its	https://bugs.launchpad.net/python-glanceclient
glance	its	https://bugs.launchpad.net/glance
glance	scm	https://github.com/openstack/glance.git
glance	scm	https://github.com/openstack/python-glanceclient.git
glance	scm	git://git.openstack.org/openstack/glance_store
glance	scr	review.openstack.org_openstack/python-glanceclient
glance	scr	review.openstack.org_openstack/glance_store
glance	scr	review.openstack.org_openstack/glance
heat	its	https://bugs.launchpad.net/python-heatclient
heat	its	https://bugs.launchpad.net/heat-templates
heat	its	https://bugs.launchpad.net/heat-cfntools
heat	its	https://bugs.launchpad.net/heat

heat	scm	https://github.com/openstack/heat.git
heat	scm	git://git.openstack.org/openstack/heat-translator
heat	scm	git://git.openstack.org/openstack-dev/heat-cfnclient
heat	scm	git://git.openstack.org/openstack/heat-cfntools
heat	scm	https://github.com/openstack/python-heatclient.git
heat	scr	review.openstack.org_openstack/heat-cfntools
heat	scr	review.openstack.org_openstack/heat-translator
heat	scr	review.openstack.org_openstack/python-heatclient
heat	scr	review.openstack.org_openstack/heat-templates
heat	scr	review.openstack.org_openstack/heat
horizon	its	https://bugs.launchpad.net/django-openstack-auth
horizon	its	https://bugs.launchpad.net/tuskar-ui
horizon	its	https://bugs.launchpad.net/horizon
horizon	scm	git://git.openstack.org/openstack/django_openstack_auth
horizon	scm	https://github.com/openstack/horizon.git
horizon	scm	git://git.openstack.org/openstack/tuskar-ui
horizon	scr	review.openstack.org_openstack/horizon
Infrastructure	its	https://bugs.launchpad.net/openstack-ci
Infrastructure	scm	git://git.openstack.org/openstack-infra/puppet-sudoers
Infrastructure	scm	git://git.openstack.org/openstack-infra/project-config
Infrastructure	scm	git://git.openstack.org/openstack-infra/puppet-iptables
Infrastructure	scm	https://github.com/openstack-infra/statusbot.git
Infrastructure	scm	git://git.openstack.org/openstack-infra/elastic-recheck
Infrastructure	scm	git://git.openstack.org/openstack-infra/irc-meetings
Infrastructure	scm	git://git.openstack.org/openstack-infra/puppet-lodgeit
Infrastructure	scm	git://git.openstack.org/openstack-infra/storyboard
Infrastructure	scm	https://github.com/openstack-infra/config.git
Infrastructure	scm	git://git.openstack.org/openstack-infra/puppet-mediawiki
Infrastructure	scm	https://github.com/openstack-infra/gerritlib.git
Infrastructure	scm	git://git.openstack.org/openstack-infra/puppet-user
Infrastructure	scm	git://git.openstack.org/openstack-infra/puppet-openstackci
Infrastructure	scm	git://git.openstack.org/openstack-infra/puppet-asterisk
Infrastructure	scm	git://git.openstack.org/openstack-infra/puppet-project-config
Infrastructure	scm	git://git.openstack.org/openstack-infra/puppet-dashboard
Infrastructure	scm	git://git.openstack.org/openstack-infra/puppet-exim
Infrastructure	scm	git://git.openstack.org/openstack-infra/puppet-simpleproxy
Infrastructure	scm	git://git.openstack.org/openstack-infra/puppet-storyboard
Infrastructure	scm	git://git.openstack.org/openstack-infra/puppet-haveged

Infrastructure	scm	https://github.com/openstack-infra/releasestatus.git
Infrastructure	scm	git://git.openstack.org/openstack-dev/openstack-nose
Infrastructure	scm	git://git.openstack.org/openstack-infra/puppet-kerberos
Infrastructure	scm	https://github.com/openstack/openstack-planet.git
Infrastructure	scm	git://git.openstack.org/openstack-infra/odsreg
Infrastructure	scm	git://git.openstack.org/openstack-infra/puppet-logstash
Infrastructure	scm	git://git.openstack.org/openstack-infra/zuul-packaging
Infrastructure	scm	https://github.com/openstack-infra/gearman-plugin.git
Infrastructure	scm	git://git.openstack.org/openstack-infra/puppet-unattended-upgrades
Infrastructure	scm	git://git.openstack.org/openstack-infra/puppet-nodepool
Infrastructure	scm	git://git.openstack.org/openstack-infra/puppet-apparmor
Infrastructure	scm	git://git.openstack.org/openstack-infra/puppet-yum
Infrastructure	scm	git://git.openstack.org/openstack-infra/puppet-pip
Infrastructure	scm	git://git.openstack.org/openstack-infra/puppet-bup
Infrastructure	scm	git://git.openstack.org/openstack-infra/puppet-elasticsearch
Infrastructure	scm	git://git.openstack.org/openstack-infra/puppet-releasestatus
Infrastructure	scm	git://git.openstack.org/openstack-infra/puppet-github
Infrastructure	scm	https://github.com/openstack-infra/jenkins-job-builder.git
Infrastructure	scm	git://git.openstack.org/openstack-infra/puppet-ssl_cert_check
Infrastructure	scm	git://git.openstack.org/openstack-infra/puppet-tmpreaper
Infrastructure	scm	git://git.openstack.org/openstack-infra/puppet-jeepyb
Infrastructure	scm	https://github.com/openstack-infra/zmq-event-publisher.git
Infrastructure	scm	git://git.openstack.org/openstack-infra/groups
Infrastructure	scm	git://git.openstack.org/openstack-infra/puppet-log_processor
Infrastructure	scm	git://git.openstack.org/openstack-infra/storyboard-webclient
Infrastructure	scm	https://github.com/openstack-infra/devstack-gate.git
Infrastructure	scm	git://git.openstack.org/openstack-infra/puppet-meetbot
Infrastructure	scm	git://git.openstack.org/openstack-infra/puppet-accessbot
Infrastructure	scm	https://github.com/openstack-infra/git-review.git
Infrastructure	scm	git://git.openstack.org/openstack-infra/puppet-vcsrepo
Infrastructure	scm	git://git.openstack.org/openstack-infra/puppet-openstackid

Infrastructure	scm	git://git.openstack.org/openstack-infra/puppet-bandersnatch
Infrastructure	scm	git://git.openstack.org/openstack-infra/puppet-drupal
Infrastructure	scm	git://git.openstack.org/openstack-infra/puppet-puppet
Infrastructure	scm	git://git.openstack.org/openstack-infra/puppet-gerrit
Infrastructure	scm	git://git.openstack.org/openstack-infra/puppet-snmpd
Infrastructure	scm	git://git.openstack.org/openstack-infra/puppet-subunit2sql
Infrastructure	scm	git://git.openstack.org/openstack-infra/puppet-httpd
Infrastructure	scm	https://github.com/openstack-infra/reviewday.git
Infrastructure	scm	git://git.openstack.org/openstack-infra/activity-board
Infrastructure	scm	git://git.openstack.org/openstack-infra/puppet-kibana
Infrastructure	scm	git://git.openstack.org/openstack-infra/os-loganalyze
Infrastructure	scm	git://git.openstack.org/openstack-infra/puppet-mailman
Infrastructure	scm	https://github.com/openstack-infra/askbot-theme.git
Infrastructure	scm	https://github.com/openstack-infra/gerritbot.git
Infrastructure	scm	git://git.openstack.org/openstack-infra/puppet-unbound
Infrastructure	scm	git://git.openstack.org/openstack-infra/puppet-openafs
Infrastructure	scm	git://git.openstack.org/openstack-infra/puppet-askbot
Infrastructure	scm	git://git.openstack.org/openstack-infra/puppet-zanata
Infrastructure	scm	git://git.openstack.org/openstack-infra/puppet-planet
Infrastructure	scm	git://git.openstack.org/openstack-infra/puppet-cgit
Infrastructure	scm	git://git.openstack.org/openstack-infra/puppet-etherpad_lite
Infrastructure	scm	git://git.openstack.org/openstack-infra/puppet-reviewday
Infrastructure	scm	git://git.openstack.org/openstack-infra/puppet-statusbot
Infrastructure	scm	git://git.openstack.org/openstack-infra/puppet-graphite
Infrastructure	scm	https://github.com/openstack-infra/nose-html-output.git
Infrastructure	scm	git://git.openstack.org/openstack-infra/subunit2sql
Infrastructure	scm	git://git.openstack.org/openstack-infra/puppet-jenkins
Infrastructure	scm	https://github.com/openstack-infra/zuul.git
Infrastructure	scm	git://git.openstack.org/openstack-infra/nodepool
Infrastructure	scm	git://git.openstack.org/openstack-infra/puppet-logrotate
Infrastructure	scm	git://git.openstack.org/openstack-infra/tripleo-ci
Infrastructure	scm	https://github.com/openstack-infra/gear.git
Infrastructure	scm	git://git.openstack.org/openstack-infra/puppet-ulimit
Infrastructure	scm	git://git.openstack.org/openstack-infra/puppet-mysql_backup
Infrastructure	scm	git://git.openstack.org/openstack-infra/puppet-ansible
Infrastructure	scm	https://github.com/openstack-infra/jeepyb.git
Infrastructure	scm	git://git.openstack.org/openstack-infra/puppet-vinz

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OpenStackClient	its	https://bugs.launchpad.net/python-openstackclient
OpenStackClient	its	https://bugs.launchpad.net/python-cliff
OpenStackClient	its	https://bugs.launchpad.net/os-client-config
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PuppetOpenStack	its	https://bugs.launchpad.net/puppet-sahara
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PuppetOpenStack	its	https://bugs.launchpad.net/puppet-nova
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PuppetOpenStack	its	https://bugs.launchpad.net/puppet-swift
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PuppetOpenStack	its	https://bugs.launchpad.net/puppet-keystone
PuppetOpenStack	its	https://bugs.launchpad.net/puppet-openstacklib
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PuppetOpenStack	its	https://bugs.launchpad.net/puppet-horizon
PuppetOpenStack	its	https://bugs.launchpad.net/puppet-neutron

PuppetOpenStack	its	https://bugs.launchpad.net/puppet-trove
PuppetOpenStack	scm	git://git.openstack.org/openstack/puppet-openstack_extras
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PuppetOpenStack	scm	git://git.openstack.org/openstack/puppet-designate
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Quality Assurance	its	https://bugs.launchpad.net/devstack
Quality Assurance	scm	git://git.openstack.org/openstack/tempest-lib
Quality Assurance	scm	git://git.openstack.org/openstack-dev/grenade
Quality Assurance	scm	git://git.openstack.org/openstack-dev/devstack
Quality Assurance	scm	https://github.com/openstack/tempest.git
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Quality Assurance	scr	review.openstack.org_openstack-dev/devstack
Rally	its	https://bugs.launchpad.net/rally
Rally	scm	git://git.openstack.org/openstack/rally
Rally	scr	review.openstack.org_openstack/rally
Release cycle management	scm	git://git.openstack.org/openstack-infra/release-tools
Release cycle management	scm	git://git.openstack.org/openstack/requirements
Release cycle management	scr	review.openstack.org_openstack/requirements
sahara	its	https://bugs.launchpad.net/python-saharaclient
sahara	its	https://bugs.launchpad.net/sahara
sahara	scm	git://git.openstack.org/openstack/sahara-image-elements
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swift	scr	review.openstack.org_openstack/swift
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