

Standard Grimoire Report
OPNFV Project
2017-Q1



April 10, 2017

Daniel Izquierdo Cortázar
Chief Data Officer
dizquierdo@bitergia.com

This report would not exist without the effort of the people involved in the development of the Grimoire toolset.

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Executive Summary

This report provides a quantitative analysis of the current and past situation of the OPNFV project. All the data presented in it is based on information retrieved from the software development repositories of the project. The analysis includes a summary of the general situation of the project, and specific analysis of some of its development processes (issue tracking, code review) and communication channels (mailing lists, IRC, AskBot). For comparison with the past, most of the data is shown on a quarterly basis.

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Chapter 1

Project overview

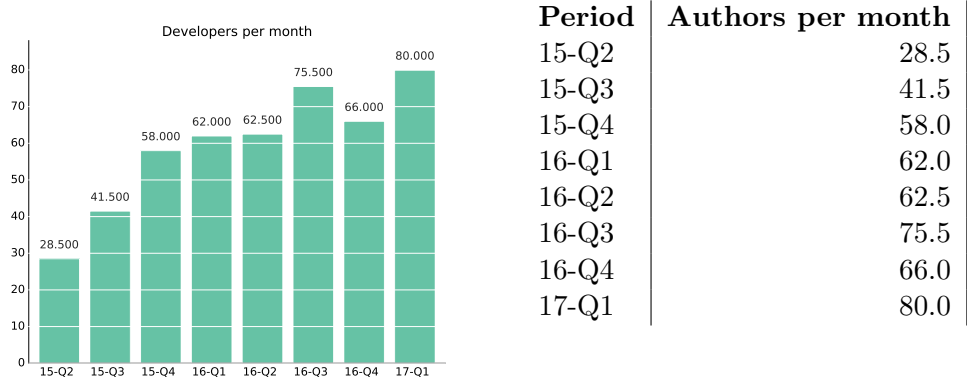
The report looks at activities across the OPNFV community during the first quarter of 2017, comparing it to previous quarters.¹.

Data source	Activity 90 days	Change (wrt to prev. 90 days)
Gits	3256 commits	86%
Tickets	841 closed tickets	125%
Mailing Lists	1694 sent emails	-3%
Gerrit	2782 submitted reviews	52%
Askbot	9 posted questions	-64%
IRC	50699 messages	14%

Table 1.1: Activity during the last 90 days and its evolution

The overall development activity has increased. Git and Gerrit activity has increased between a 52% and a 86%. This is also in line with the Jira activity with an increase closing tickets of 125%. On the other hand the mailing list activity has decreased a 3%, but communication through IRC has increased a 14%. Askbot shows an 64% of activity decrease. If compared to previous periods, this quarter shows a similar activity level than 2016-Q1 and 2016-Q3.

¹The analyzed data sources are available in appendixB



In this quarter of 2017 the mean number of developers active per month has reached a total of 80. It is an increase when compared to the previous quarter, and in line with the third quarter of 2016. This is the highest peak of different developers participating per month in mean of the whole analysis.

The total number of contributors divided into three sets (core, regular and casual²) follow a similar pattern.

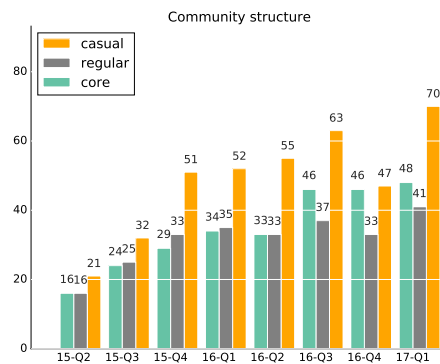


Figure 1.1: Evolution during the last quarters of core, regular and casual developers (based on git activity)

²Contributing 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.

Period	Core	Regular	Occasional
15-Q2	16	16	21
15-Q3	24	25	32
15-Q4	29	33	51
16-Q1	34	35	52
16-Q2	33	33	55
16-Q3	46	37	63
16-Q4	46	33	47
17-Q1	48	41	70

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

This report aims to provide some insight into the software development process of the OPNFV 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.

REI	BMI	TTM
0.94	1.22	0.75 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)

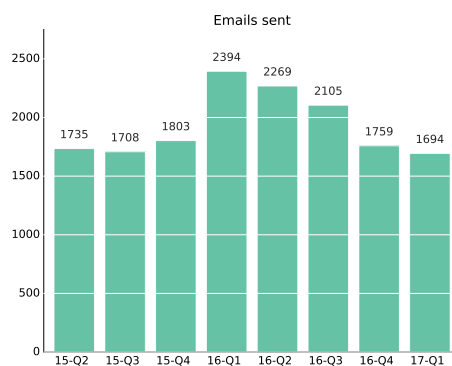
Chapter 2

Communication and support-related activities

Analysis of the communication channels used for communication and support-related activities.

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, a table is presented with the hot topics in the several analyzed mailing lists. This shows hot topics ordered by number of total posts in such thread.

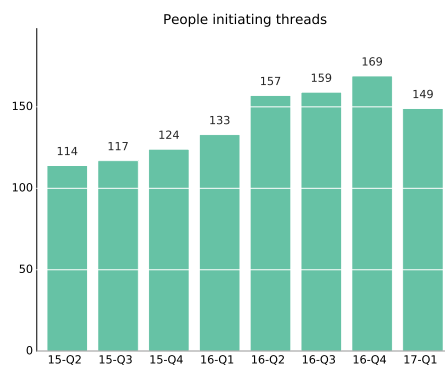


Period	Emails
15-Q2	1735
15-Q3	1708
15-Q4	1803
16-Q1	2394
16-Q2	2269
16-Q3	2105
16-Q4	1759
17-Q1	1694

2.1. MAILING LISTS



Period	People
15-Q2	185
15-Q3	207
15-Q4	204
16-Q1	229
16-Q2	267
16-Q3	251
16-Q4	252
17-Q1	210



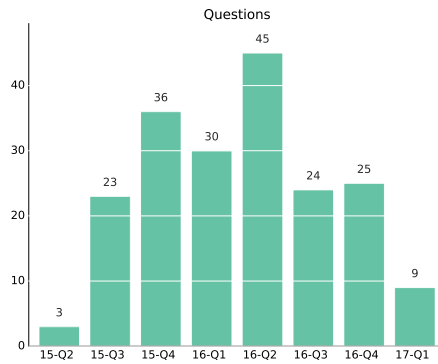
Period	People
15-Q2	114
15-Q3	117
15-Q4	124
16-Q1	133
16-Q2	157
16-Q3	159
16-Q4	169
17-Q1	149

Initial Author and Date	Subject	Number Messages
David McBride 2017-02-22	[opnfv-project-leads] [release][danube] MS6 compliance assessment	19
chen jiankun 2017-03-02	[opnfv-tech-discuss] [yardstick] Yardstick run-time issue	19
David McBride 2017-01-19	[opnfv-project-leads] Reminder - Danube Milestone 5 - Feature Freeze and Scenario Integration - Jan 27	18
Veena Lingadahalli 2017-01-09	[opnfv-tech-discuss] [Fuel9.0][vlan] Fuel9.0 deployment failing with br-aux not found	16
achivkun 2017-03-15	[opnfv-tech-discuss] [fuel][plugins][odl] SFC agent for SFs/SFFs/Classifiers creation	15
KA PDE 2017-02-13	[opnfv-tech-discuss] Functest ODL-SFC	13
hongbo tian 2017-01-14	[opnfv-tech-discuss] [dovetail]if the l3vpn feature is completed fully in C release	13
Sofia Wallin 2017-02-07	[opnfv-project-leads] [opnfv-tech-discuss] [opnfvdocs] Documentation update for Danube release	13
Srikanth Kumar Lingala 2017-02-07	[opnfv-tech-discuss] ODL SFC with single compute node and OVS 2.6.1 NSH patches	13
christopher.price 2017-01-25	[opnfv-tech-discuss] [dovetail]L3VPN for dovetail area	13

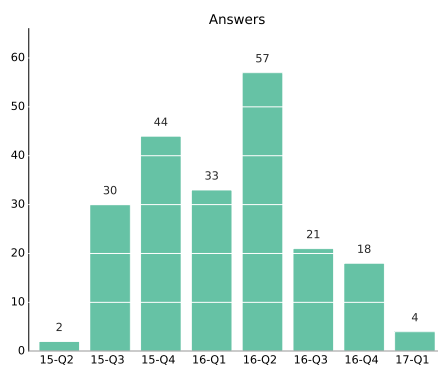
2.2 Questions and Answers

The following charts show activity in the Ask site. Total number of questions, number of answers, number of comments and people sending questions are depicted. In addition two tables represent the hot topics activity in the Ask OPNFV site. These show information about the top visited questions and questions with the highest number of people participating.

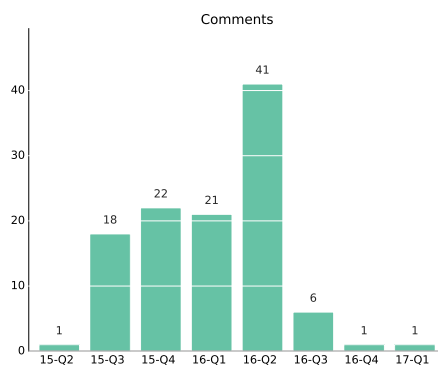
2.2. QUESTIONS AND ANSWERS



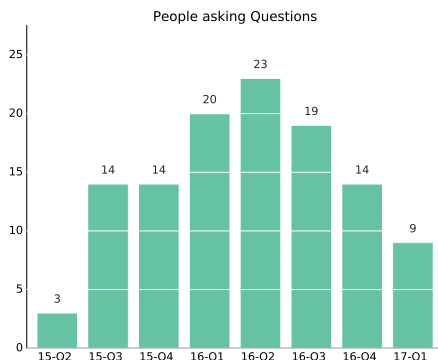
Period	Questions
15-Q2	3
15-Q3	23
15-Q4	36
16-Q1	30
16-Q2	45
16-Q3	24
16-Q4	25
17-Q1	9



Period	Answers
15-Q2	2
15-Q3	30
15-Q4	44
16-Q1	33
16-Q2	57
16-Q3	21
16-Q4	18
17-Q1	4



Period	Comments
15-Q2	1
15-Q3	18
15-Q4	22
16-Q1	21
16-Q2	41
16-Q3	6
16-Q4	1
17-Q1	1



Period	People asking
15-Q2	3
15-Q3	14
15-Q4	14
16-Q1	20
16-Q2	23
16-Q3	19
16-Q4	14
17-Q1	9

- Top visited questions.

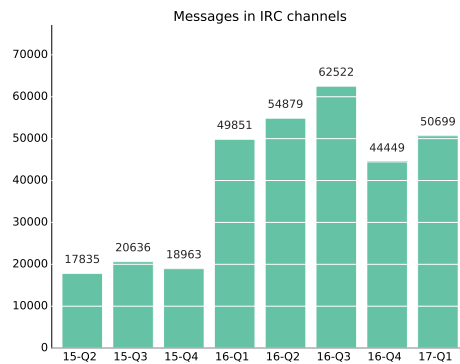
Question subject	Visits
swagger access+	10
fuel install fail in virtual environment+	6
10 innovative essay writing methods+	3
fail to build bootstrap image in+	2
opnfv node server bootstrap failure on+	1
network node in openstack+	0
unsuccessful execution of functest+	0
i am losing connectivity to horizon+	0
error when running basic tests in+	0

- Top questions with the highest number of people participating.

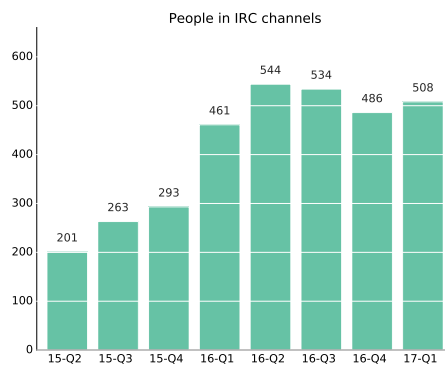
Question subject	People participating
swagger access+	3
fuel install fail in virtual environment+	1
opnfv node server bootstrap failure on+	1
10 innovative essay writing methods+	1
unsuccessful execution of functest+	1
network node in openstack+	1
i am losing connectivity to horizon+	1
error when running basic tests in+	1
fail to build bootstrap image in+	1

2.3 IRC

The community uses several IRC channels for asynchronous communication. This section shows information about the total number of messages sent in the community during the last 7 quarters together with the number of people participating in such discussions.



Period	Messages
15-Q2	17835
15-Q3	20636
15-Q4	18963
16-Q1	49851
16-Q2	54879
16-Q3	62522
16-Q4	44449
17-Q1	50699



Period	People
15-Q2	201
15-Q3	263
15-Q4	293
16-Q1	461
16-Q2	544
16-Q3	534
16-Q4	486
17-Q1	508

Chapter 3

Details on OPNFV development community

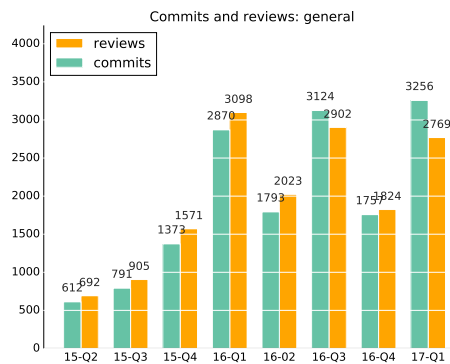
Each breakdown is divided into three sections with information from the last 6 quarters:

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

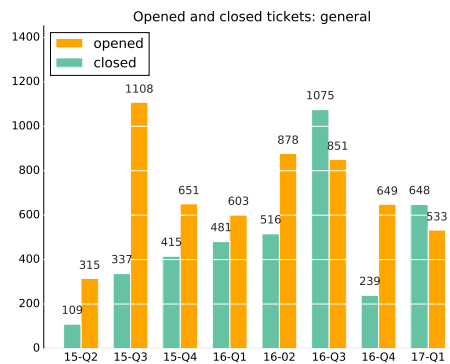
3.1 Details of the project

3.2 Activity

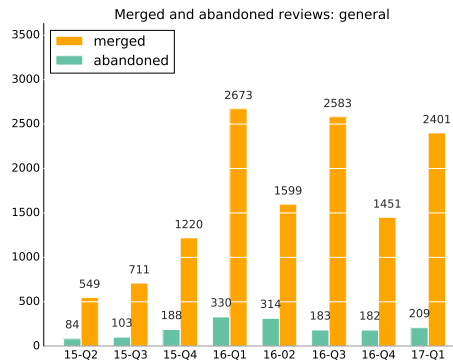
Commits in Git, submitted, merged and abandoned reviews in Gerrit and opened and closed issues in Jira.



Period	Commits	Reviews
15-Q2	612	692
15-Q3	791	905
15-Q4	1373	1571
16-Q1	2870	3098
16-Q2	1793	2023
16-Q3	3124	2902
16-Q4	1757	1824
17-Q1	3256	2769



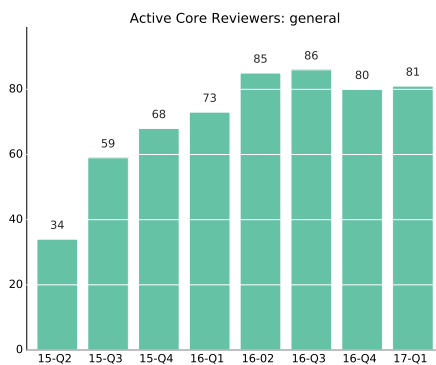
Period	Closed	Opened
15-Q2	109	315
15-Q3	337	1108
15-Q4	415	651
16-Q1	481	603
16-Q2	516	878
16-Q3	1075	851
16-Q4	239	649
17-Q1	648	533



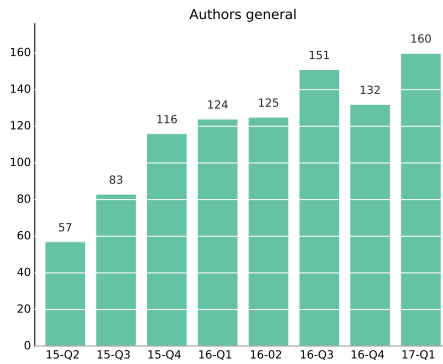
Period	Merged	Abandoned
15-Q2	549	84
15-Q3	711	103
15-Q4	1220	188
16-Q1	2673	330
16-Q2	1599	314
16-Q3	2583	183
16-Q4	1451	182
17-Q1	2401	209

3.3 Community

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



Period	Active Core
15-Q2	34
15-Q3	59
15-Q4	68
16-Q1	73
16-Q2	85
16-Q3	86
16-Q4	80
17-Q1	81



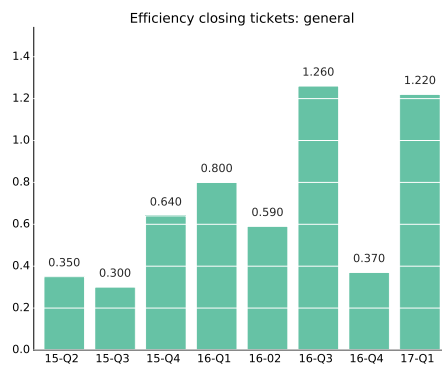
Period	Authors
15-Q2	57
15-Q3	83
15-Q4	116
16-Q1	124
16-Q2	125
16-Q3	151
16-Q4	132
17-Q1	160

Commit (s)	Author
217	Yujun Zhang
213	Morgan Richomme
192	Jose Lausuch
178	Tim Rozet
163	Shubham Rathi
159	Fatih Degirmenci
122	Alexandru Avadanii
122	Jing Lu
111	Narinder Gupta
108	zhihui wu

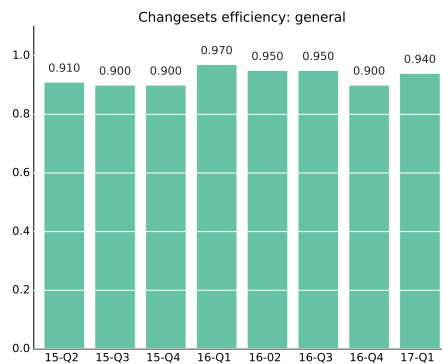
Commit (s)	Organizations
796	Huawei
693	Ericsson
582	ZTE Corporation
318	Intel
303	Red Hat
283	Orange
169	ENEA AB
131	SUSE
86	ATT
83	Linux Foundation
70	Mirantis
63	NEC
38	Dell
38	EMC
28	Cisco
17	Tata Consultancy
12	Nokia
7	Fraunhofer FOKUS
4	Hewlett Packard Enterprise Co.
2	Juniper
1	MontaVista

3.4 Process

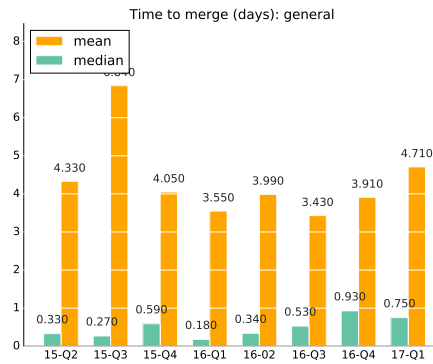
Efficiency closing changesets and tickets, time to review (mean and median), number of patchsets (iterations) per changeset and study on the time waiting for a reviewer or submitter action in the patchset review process.



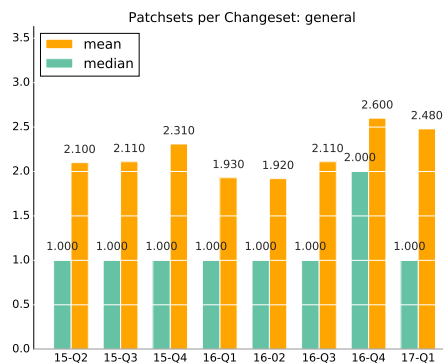
Period	Closed/Opened
15-Q2	0.35
15-Q3	0.3
15-Q4	0.64
16-Q1	0.8
16-Q2	0.59
16-Q3	1.26
16-Q4	0.37
17-Q1	1.22



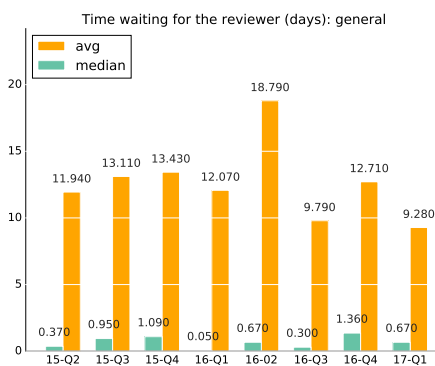
Period	(Aband. and Merg.)/Subm.
15-Q2	0.91
15-Q3	0.9
15-Q4	0.9
16-Q1	0.97
16-Q2	0.95
16-Q3	0.95
16-Q4	0.9
17-Q1	0.94



Period	Median	Mean
15-Q2	0.33	4.33
15-Q3	0.27	6.84
15-Q4	0.59	4.05
16-Q1	0.18	3.55
16-Q2	0.34	3.99
16-Q3	0.53	3.43
16-Q4	0.93	3.91
17-Q1	0.75	4.71

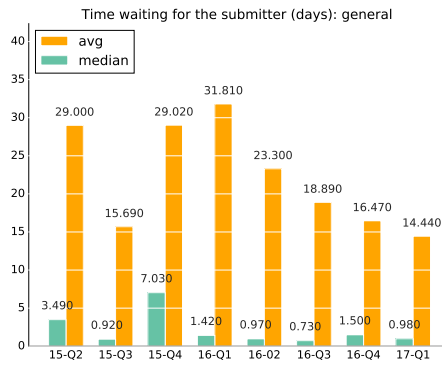


Period	Median	Mean
15-Q2	1.0	2.1
15-Q3	1.0	2.11
15-Q4	1.0	2.31
16-Q1	1.0	1.93
16-Q2	1.0	1.92
16-Q3	1.0	2.11
16-Q4	2.0	2.6
17-Q1	1.0	2.48



Period	Median	Mean
15-Q2	0.37	11.94
15-Q3	0.95	13.11
15-Q4	1.09	13.43
16-Q1	0.05	12.07
16-Q2	0.67	18.79
16-Q3	0.3	9.79
16-Q4	1.36	12.71
17-Q1	0.67	9.28

3.4. PROCESS



Period	Median	Mean
15-Q2	3.49	29.0
15-Q3	0.92	15.69
15-Q4	7.03	29.02
16-Q1	1.42	31.81
16-Q2	0.97	23.3
16-Q3	0.73	18.89
16-Q4	1.5	16.47
17-Q1	0.98	14.44

Appendix A

Metrics Definitions

- 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). In addition, all branches are aggregated to the analysis.
- Submitted changeset: a changeset is the process of peer reviewing source code changes. A submitted code 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.
- 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 Jira is counted as closed if the status of such ticket is defined as 'Closed'. 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.
- 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 source code of the scripts and templates used to produce this report are available from the GrimoireReports repository¹.

The databases used for the analysis can be obtained from the “Data sources” panel² of the Grimoire Dashboard for the project³.

¹<https://github.com/VizGrimoire/GrimoireReports>

²http://projects.bitergia.com/opnfv/browser/data_sources.html

³<http://projects.bitergia.com/opnfv/>