

Standard Grimoire Report
OPNFV Project
2015-Q4



January 27, 2016

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.

(cc) 2015 Bitergia. Some rights reserved.
This work licensed under Creative Commons Attribution-ShareAlike 4.0
Unported License.
To view a copy of full license, see
<http://creativecommons.org/licenses/by-sa/4.0>,
or write to Creative Commons, 559 Nathan Abbott Way, Stanford,
California 94305, USA.

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.

Contents

1	Project overview	4
2	Communication and support-related activities	7
2.1	Mailing Lists	7
2.2	Questions and Answers	9
2.3	IRC	12
3	Details on OPNFV development community	14
3.1	Details of the project	15
3.2	Activity	15
3.3	Community	16
3.4	Process	17
A	Metrics Definitions	20
B	Source code and data sources	23

Chapter 1

Project overview

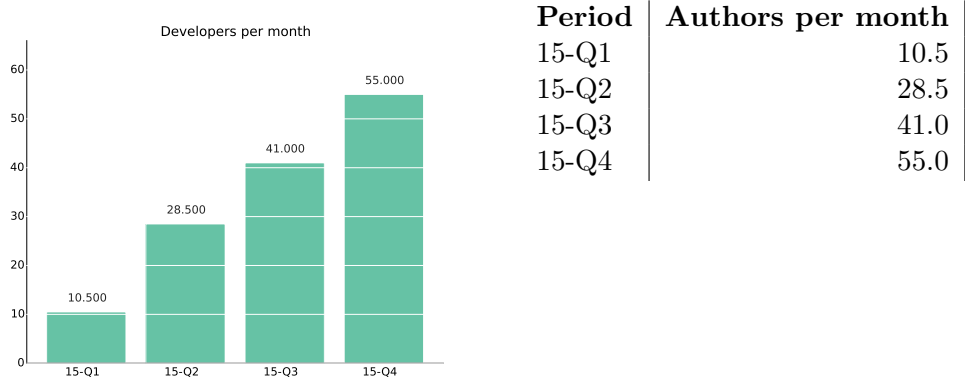
The report looks at activities across the OPNFV community during the fourth quarter of 2015, comparing it to previous three quarters.¹.

Data source	Activity 90 days	Change (wrt to prev. 90 days)
Gits	1309 commits	68%
Tickets	380 closed tickets	10%
Mailing Lists	600 sent emails	-63%
Gerrit	1543 submitted reviews	71%
IRC	18826 messages	-10%

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

The overall development activity has increased. Git and Gerrit activity show an increase of around 70%. On the other hand, communication channels seem to show a slowdown of activity with decreases of 63% in the case of the mailing lists and a 10% in the case of IRC channels.

¹The analyzed data sources are available in appendixB



In this quarter of 2015 the mean number of developers active per month has reached a total of 55. It is an increase when compared to previous quarters.

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

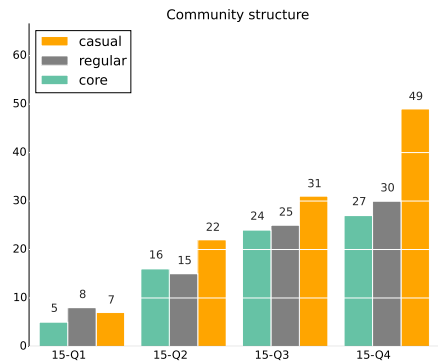


Figure 1.1: Evolution during the last quarters of core, regular and casual developers (based on git activity)

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-Q1	5	8	7
15-Q2	16	15	22
15-Q3	24	25	31
15-Q4	27	30	49

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
0.9	0.65	0.56 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)

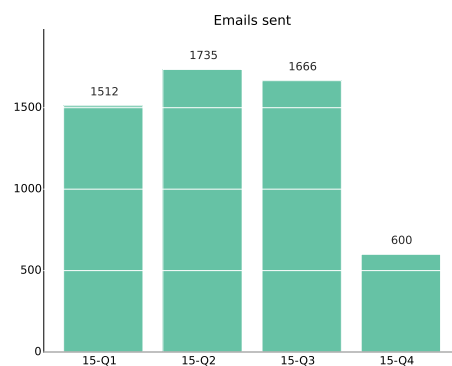
Chapter 2

Communication and support-related activities

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

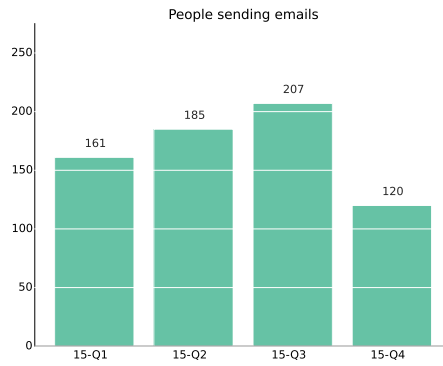
2.1 Mailing Lists

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.

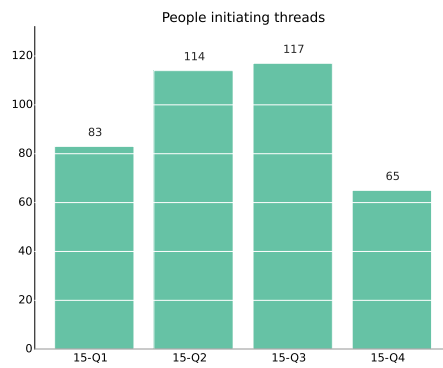


Period	Emails
15-Q1	1512
15-Q2	1735
15-Q3	1666
15-Q4	600

2.1. MAILING LISTS



Period	People
15-Q1	161
15-Q2	185
15-Q3	207
15-Q4	120



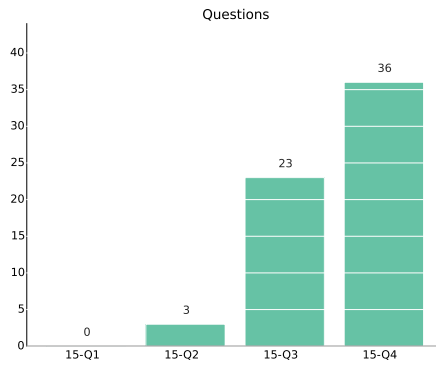
Period	People
15-Q1	83
15-Q2	114
15-Q3	117
15-Q4	65

Initial Author and Date	Subject	Number Messages
Dave Neary 2015-10-01	[opnfv-tsc] Election process - call for comments/discussion	22
joehuang 2015-10-07	[opnfv-tech-discuss] [multisite] new project no meeting this week	20
Debra Scott 2015-11-25	[opnfv-tsc] Action due by Dec 1: Milestone D Reports and process	18
Debra Scott 2015-11-30	[opnfv-tsc] Reminder: Milestone D reports due Dec 1	15
ERROR 2015-10-18	[opnfv-tech-discuss] [ovsnfv] ARNO Virtual deployment fails behind proxy during ODL plugin installation	10
Frank Brockners 2015-10-01	[opnfv-tsc] Arno SR1 - technically complete	9
zhoutianran 2015-10-13	[opnfv-tech-discuss] [Movie][RS] agenda for movie meeting	9
christopher.price 2015-10-09	[opnfv-tech-discuss] [opnfv-tsc] Minutes of Tech Discussion on 10/08/2015	8
Debra Scott 2015-12-18	[opnfv-tsc] Committee for Go/No Go Release Decisions	8
Raymond Paik 2015-10-05	[opnfv-tech-discuss] Upcoming OPNFV Design Summit + demo theater	8

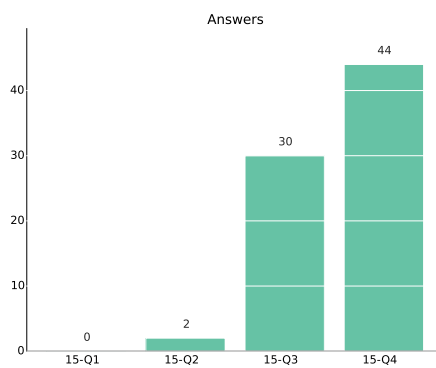
2.2 Questions and Answers

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. Those show information about the top visited questions and questions with the highest number of different people participating.

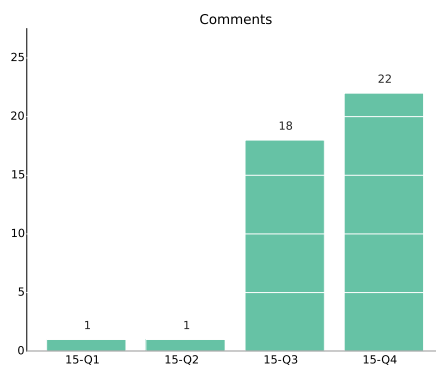
2.2. QUESTIONS AND ANSWERS



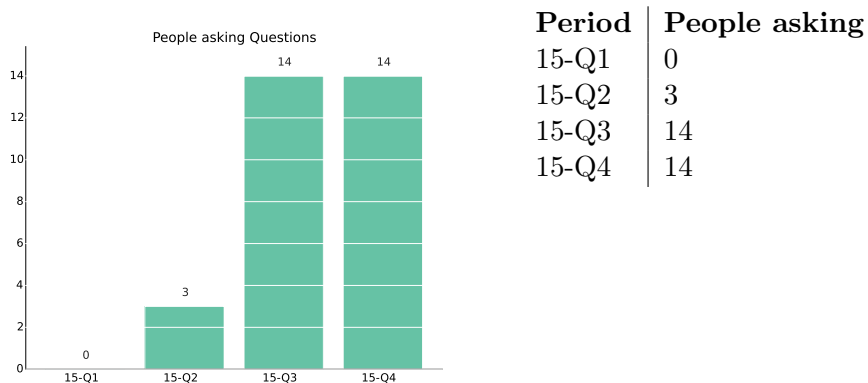
Period	Questions
15-Q1	0
15-Q2	3
15-Q3	23
15-Q4	36



Period	Answers
15-Q1	0
15-Q2	2
15-Q3	30
15-Q4	44



Period	Comments
15-Q1	1
15-Q2	1
15-Q3	18
15-Q4	22



- Top visited questions.

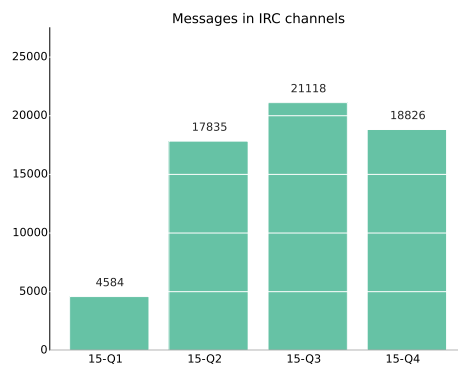
Question subject	Visits
failed to deploy opendaylight+	98
arno sr1 with odl deploy failed+	91
vnf deployment+	31
verifying network failure+	23
deployment failed with arno sr1 with+	20
deploy external compute node manually in+	17
deployment failed with arno sr1 with+	15
fuel master doesnt finish loading on+	13
fuel networks configuration+	11
running odl client fails+	11

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

Question subject	People participating
arno sr1 with odl deploy failed+	6
verifying network failure+	4
failed to deploy opendaylight+	3
duplicate host found with ip ip_address+	3
opnfv public network+	3
arno vs fuel+	2
node failed to reboot synchronizing scsi+	2
fuel master doesnt finish loading on+	2
fuel networks configuration+	2
deployment failed with arno sr1 with+	2

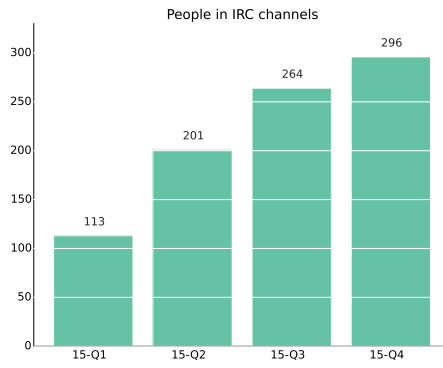
2.3 IRC

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 3 quarters together with the number of people participating in such discussions.



Period	Messages
15-Q1	4584
15-Q2	17835
15-Q3	21118
15-Q4	18826

2.3. IRC



Period	People
15-Q1	113
15-Q2	201
15-Q3	264
15-Q4	296

Chapter 3

Details on OPNFV development community

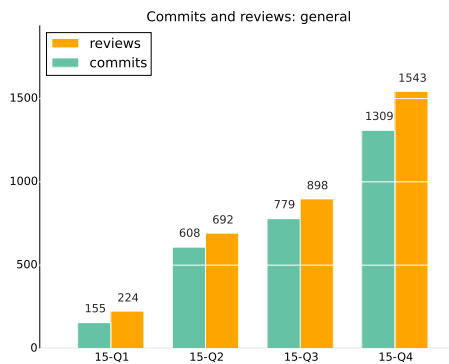
Each breakdown is divided into three sections with information from the last eight quarters:

- 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. of each project.
- 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.

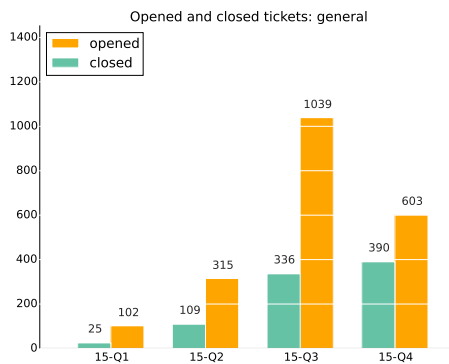
3.1 Details of the project

3.2 Activity

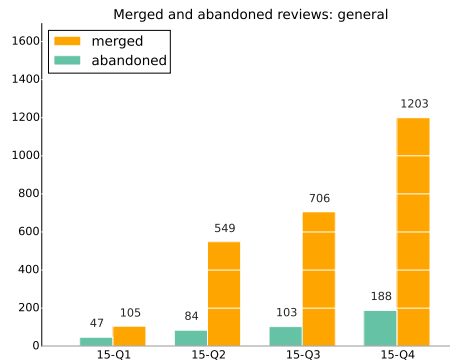
Commits in Git, submitted, merged and abandoned reviews in Gerrit and opened and closed issues in Jira.



Period	Commits	Reviews
15-Q1	155	224
15-Q2	608	692
15-Q3	779	898
15-Q4	1309	1543



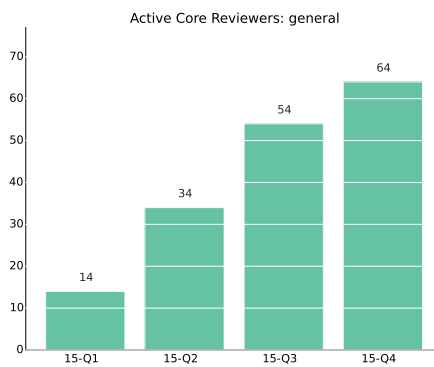
Period	Closed	Opened
15-Q1	25	102
15-Q2	109	315
15-Q3	336	1039
15-Q4	390	603



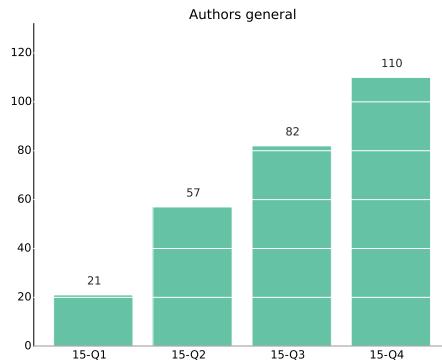
Period	Merged	Abandoned
15-Q1	105	47
15-Q2	549	84
15-Q3	706	103
15-Q4	1203	188

3.3 Community

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



Period	Active Core
15-Q1	14
15-Q2	34
15-Q3	54
15-Q4	64



Period	Authors
15-Q1	21
15-Q2	57
15-Q3	82
15-Q4	110

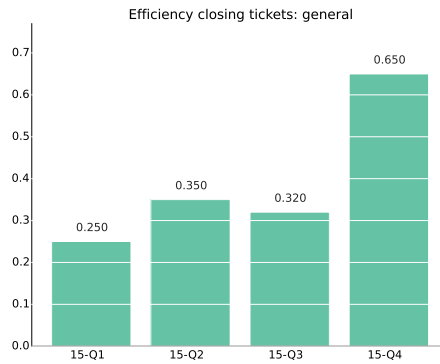
Commit (s)	Author
134	Jose Lausuch
107	Fatih Degirmenci
85	Morgan Richomme
81	Ryota MIBU
67	Narinder Gupta
64	Ashlee Young
62	Dan Radez
62	Tim Rozet
54	Thomas D
52	Bin Hu

Commit (s)	Organizations
377	Huawei
360	Ericsson
197	Orange
127	Red Hat
97	Intel
85	ATT
81	NEC
18	Dell
17	ZTE Corporation
16	Nokia
14	Linux Foundation
7	Cisco
3	EMC
3	Mirantis
1	Freescale

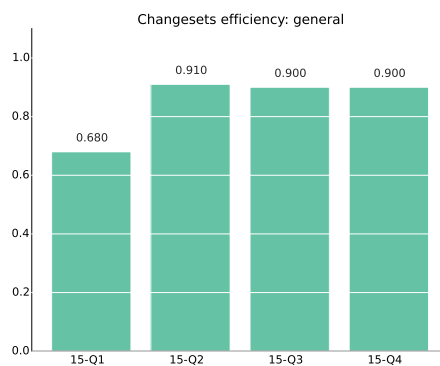
3.4 Process

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.

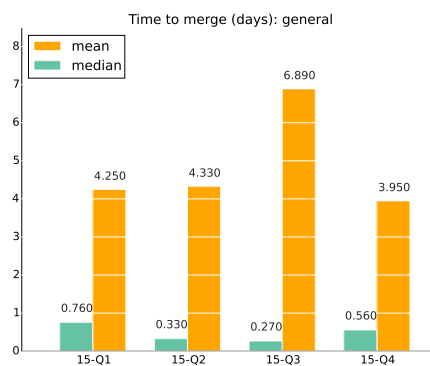
3.4. PROCESS



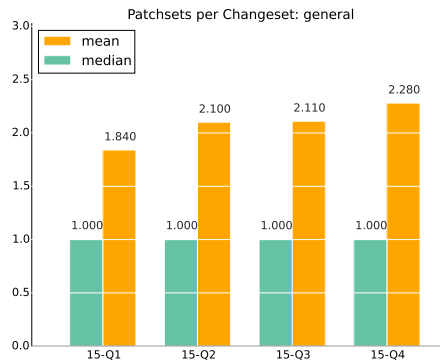
Period	Closed/Opened
15-Q1	0.25
15-Q2	0.35
15-Q3	0.32
15-Q4	0.65



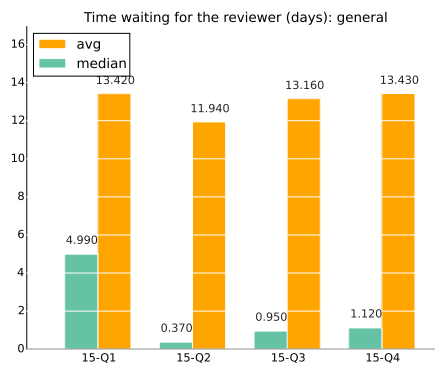
Period	(Aband. and Merg.)/Subm.
15-Q1	0.68
15-Q2	0.91
15-Q3	0.9
15-Q4	0.9



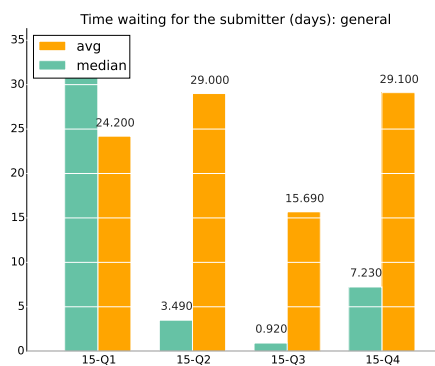
Period	Median	Mean
15-Q1	0.76	4.25
15-Q2	0.33	4.33
15-Q3	0.27	6.89
15-Q4	0.56	3.95



Period	Median	Mean
15-Q1	1.0	1.84
15-Q2	1.0	2.1
15-Q3	1.0	2.11
15-Q4	1.0	2.28



Period	Median	Mean
15-Q1	4.99	13.42
15-Q2	0.37	11.94
15-Q3	0.95	13.16
15-Q4	1.12	13.43



Period	Median	Mean
15-Q1	32.55	24.2
15-Q2	3.49	29.0
15-Q3	0.92	15.69
15-Q4	7.23	29.1

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 changesets: 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/>