

Standard Grimoire Report  
OPNFV Project  
2018-Q2



August 9, 2018

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 second quarter of 2018, comparing it to previous quarters.<sup>1</sup>.

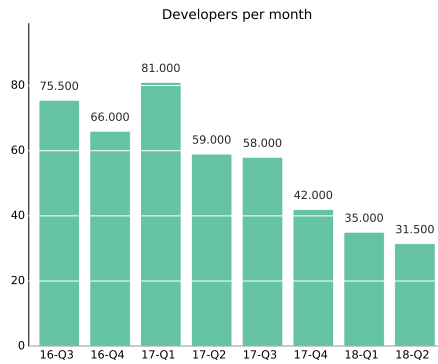
<b>Data source</b>	<b>Activity 90 days</b>	<b>Change (wrt to prev. 90 days)</b>
Gits	3497 commits	11%
Tickets	528 closed tickets	-3%
Mailing Lists	579 sent emails	-25%
Gerrit	1552 submitted reviews	-2%
Askbot	13 posted questions	116%
IRC	13361 messages	-12%

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

The overall development activity is stable with slightly increase in the number of commits of 11%, while the review processes and tickets have decreased 3% and 2% respectively. The big drop of activity is focused on the communication channels with 25% in the case of the mailing lists and 12% decrease in the case of the IRC messages.

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<sup>1</sup>The analyzed data sources are available in appendixB



Period	Authors per month
16-Q3	75.5
16-Q4	66.0
17-Q1	81.0
17-Q2	59.0
17-Q3	58.0
17-Q4	42.0
18-Q1	35.0
18-Q2	31.5

In this quarter of 2018 the mean number of developers active per month has reached a total of 31. It is a decrease when compared to the previous quarter, and a valley of activity for the last 8 quarters.

The total number of contributors divided into three sets (core, regular and casual<sup>2</sup>) follow a similar pattern.

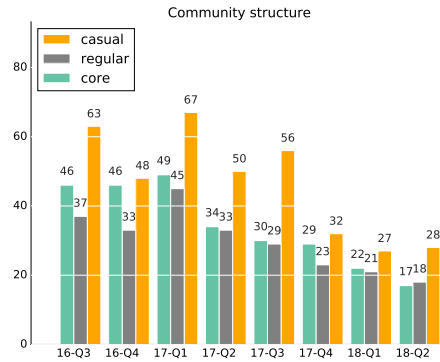


Figure 1.1: Evolution during the last quarters of core, regular and casual developers (based on git activity)

<sup>2</sup>Contributing 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.

<b>Period</b>	<b>Core</b>	<b>Regular</b>	<b>Occasional</b>
16-Q3	46	37	63
16-Q4	46	33	48
17-Q1	49	45	67
17-Q2	34	33	50
17-Q3	30	29	56
17-Q4	29	23	32
18-Q1	22	21	27
18-Q2	17	18	28

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.

<b>REI</b>	<b>BMI</b>	<b>TTM</b>
0.95	0.77	0.96 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)

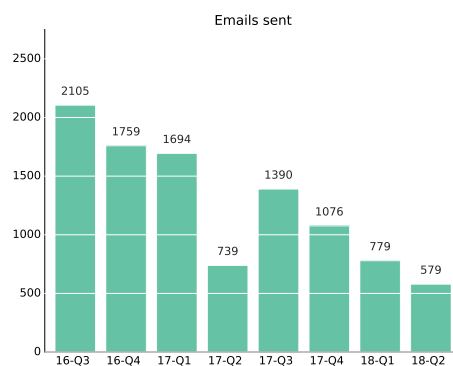
## Chapter 2

# 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.



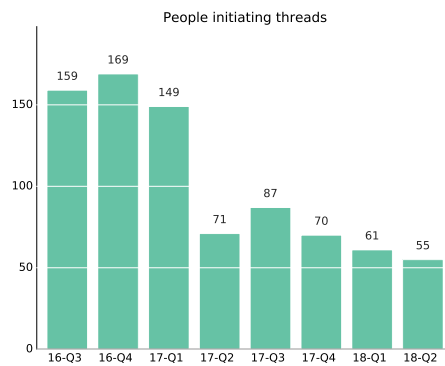
Period	Emails
16-Q3	2105
16-Q4	1759
17-Q1	1694
17-Q2	739
17-Q3	1390
17-Q4	1076
18-Q1	779
18-Q2	579



## 2.1. MAILING LISTS



Period	People
16-Q3	251
16-Q4	252
17-Q1	210
17-Q2	111
17-Q3	125
17-Q4	112
18-Q1	84
18-Q2	82



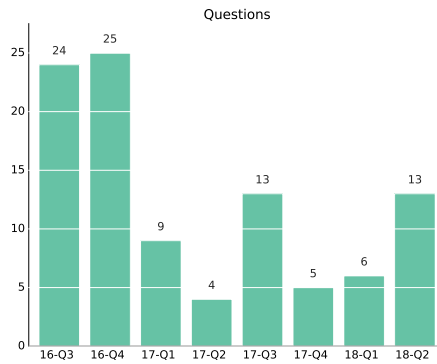
Period	People
16-Q3	159
16-Q4	169
17-Q1	149
17-Q2	71
17-Q3	87
17-Q4	70
18-Q1	61
18-Q2	55

Initial Author and Date	Subject	Number Messages
Aaron Smith 2018-04-20	[opnfv-tech-discuss] [barometer]	12
Thanh Ha 2018-04-05	[opnfv-tech-discuss] [docs] Cross Community Docu- mentation effort	11
Raymond Paik 2018-06-17	[opnfv-tech-discuss] [announce] moving on....	11
Mark.Beierl 2018-04-06	[opnfv-tech-discuss] [armband] [fuel] Deployment file for Fuel on LaaS ARM	10
David McBride 2018-04-25	[opnfv-project-leads] [release][documentation][fraser] MS9 - final documentation (TODAY)	9
Trevor Cooper 2018-04-23	[opnfv-tech-discuss] [vsperf] Agenda for VSPERF weekly meeting - 28 Feb 2018 (ww57)	9
David McBride 2018-04-11	[opnfv-project-leads] [release][gambia] review of dual- track release for Gambia?	8
Yuyang Gabriel 2018-04-03	[test-wg] Guideline for participants //RE: Discussion about Fraser Plugfest/Plugtest from Testperf	8
David McBride 2018-05-16	[opnfv-project-leads] [release][gambia] MS2 - Test case documentation in the test case database - May 25	8
Georg Kunz 2018-05-23	[opnfv-tech-discuss] [dovetail] Agenda for weekly meeting - 2018-05-23	6

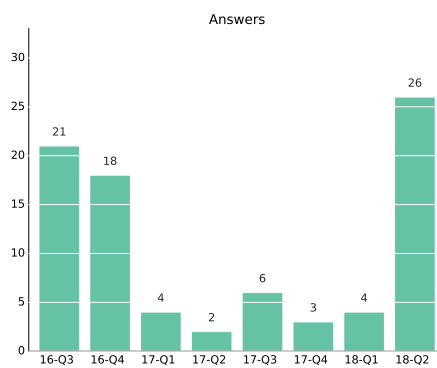
## 2.2 Questions and Answers

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.

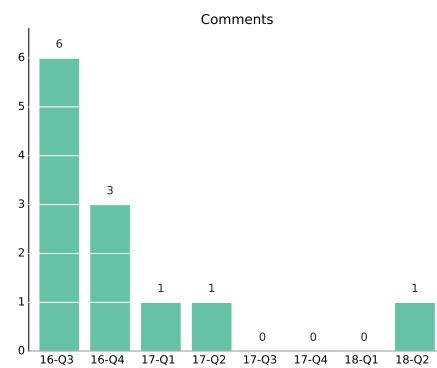
## 2.2. QUESTIONS AND ANSWERS



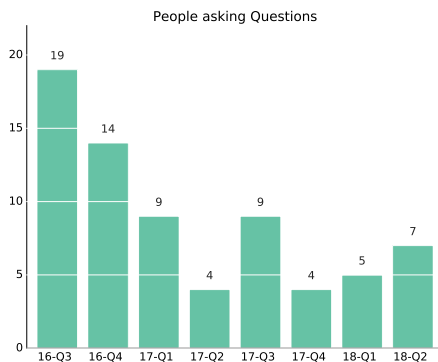
Period	Questions
16-Q3	24
16-Q4	25
17-Q1	9
17-Q2	4
17-Q3	13
17-Q4	5
18-Q1	6
18-Q2	13



Period	Answers
16-Q3	21
16-Q4	18
17-Q1	4
17-Q2	2
17-Q3	6
17-Q4	3
18-Q1	4
18-Q2	26



Period	Comments
16-Q3	6
16-Q4	3
17-Q1	1
17-Q2	1
17-Q3	0
17-Q4	0
18-Q1	0
18-Q2	1



Period	People asking
16-Q3	19
16-Q4	14
17-Q1	9
17-Q2	4
17-Q3	9
17-Q4	4
18-Q1	5
18-Q2	7

- Top visited questions.

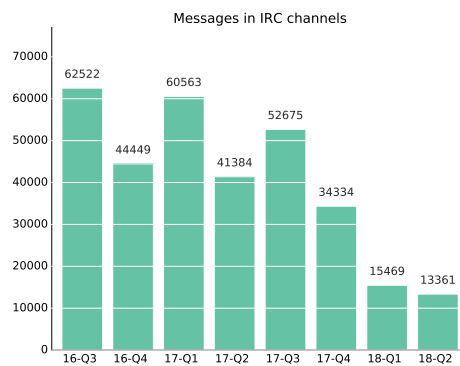
Question subject	Visits
openstack fails at pacemaker install+	48
what is the importance of academic+	44
economic problem+	28
pxe boot fails and stuck at+	3
i encountered such a problem i+	2
geometry homework help+	1
what is the purpose of online+	1
guys help me run into such+	1
help solve the task of chemistry+	0
is it possible to have a+	0

- Top questions with the highest number of people participating.

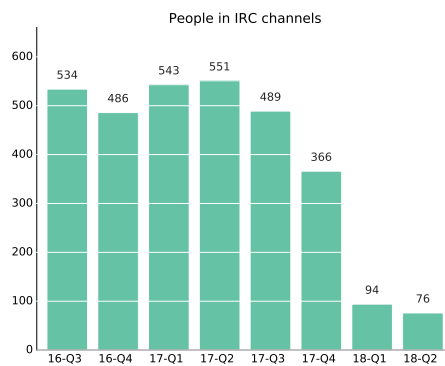
Question subject	People participating
openstack fails at pacemaker install+	3
what is the importance of academic+	2
economic problem+	2
pxe boot fails and stuck at+	2
what is the purpose of online+	1
geometry homework help+	1
fuel does not discover nodes after+	1
i encountered such a problem i+	1
how should you configure the pxemgmt+	1
is it possible to have a+	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
16-Q3	62522
16-Q4	44449
17-Q1	60563
17-Q2	41384
17-Q3	52675
17-Q4	34334
18-Q1	15469
18-Q2	13361



Period	People
16-Q3	534
16-Q4	486
17-Q1	543
17-Q2	551
17-Q3	489
17-Q4	366
18-Q1	94
18-Q2	76

## Chapter 3

# Details on OPNFV development community

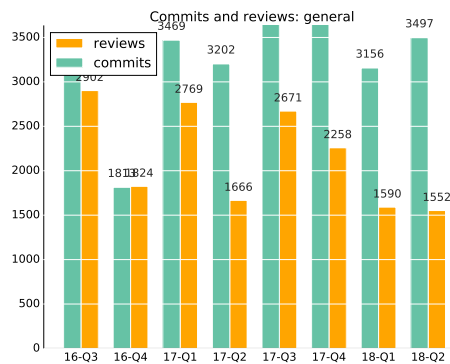
Each breakdown is divided into three sections with information from the last 6 quarters:

- 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.

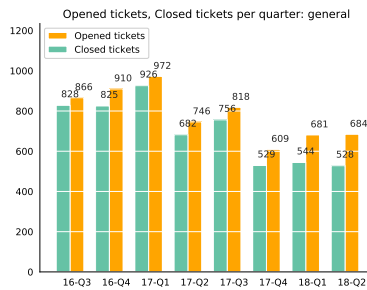
### 3.1 Details of the project

### 3.2 Activity

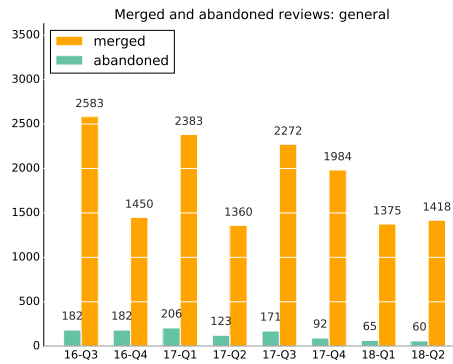
Commits in Git, submitted, merged and abandoned reviews in Gerrit and opened and closed issues in Jira.



Period	Commits	Reviews
16-Q3	3155	2902
16-Q4	1813	1824
17-Q1	3469	2769
17-Q2	3202	1666
17-Q3	5185	2671
17-Q4	4167	2258
18-Q1	3156	1590
18-Q2	3497	1552



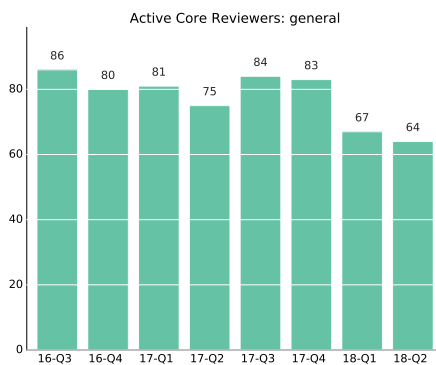
Period	Closed	Opened
16-Q3	828	866
16-Q4	825	910
17-Q1	926	972
17-Q2	682	746
17-Q3	756	818
17-Q4	529	609
18-Q1	544	681
18-Q2	528	684



Period	Merged	Abandoned
16-Q3	2583	182
16-Q4	1450	182
17-Q1	2383	206
17-Q2	1360	123
17-Q3	2272	171
17-Q4	1984	92
18-Q1	1375	65
18-Q2	1418	60

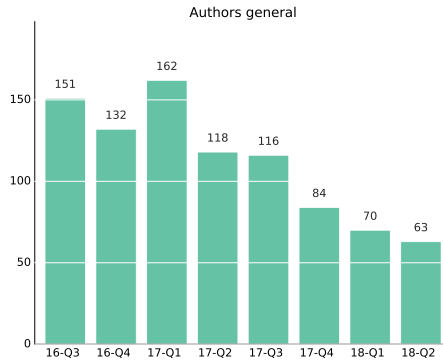
### 3.3 Community

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



Period	Active Core
16-Q3	86
16-Q4	80
17-Q1	81
17-Q2	75
17-Q3	84
17-Q4	83
18-Q1	67
18-Q2	64





Period	Authors
16-Q3	151
16-Q4	132
17-Q1	162
17-Q2	118
17-Q3	116
17-Q4	84
18-Q1	70
18-Q2	63

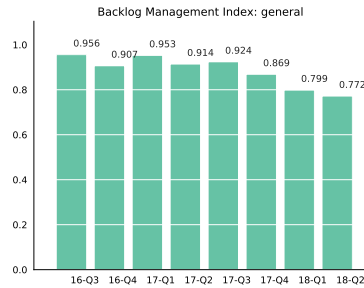
Commit (s)	Author
633	Trevor Bramwell
559	cedric.ollivier
369	Aric Gardner
368	Alexandru Avadani
299	Tim Rozet
186	Markos Chandras
105	Georg Kunz
97	Michael Polenchuk
93	Manuel Buil
75	Ross Brattain

Commit (s)	Organizations
1003	Linux Foundation
587	Orange
414	ENEA AB
408	Huawei
370	Red Hat
279	SUSE
245	Ericsson
186	ZTE Corporation
161	Intel
101	Mirantis
43	Dell
43	EMC
42	Nokia
29	ATT
25	NEC
11	Juniper

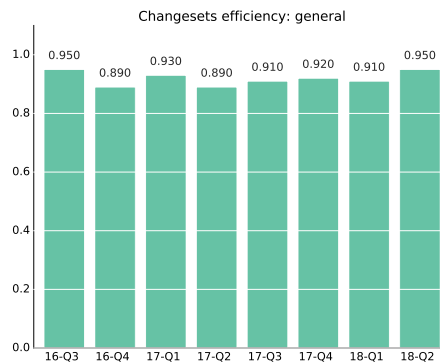
### 3.4 Process

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.

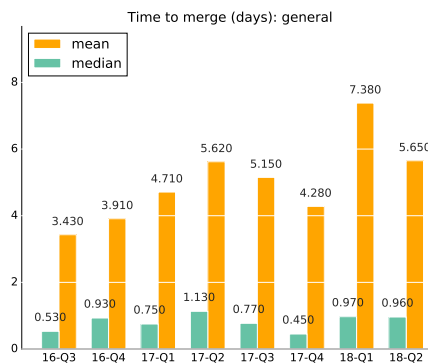
### 3.4. PROCESS



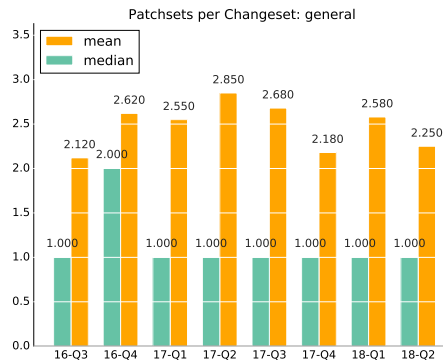
Period	Closed/Opened
16-Q3	0.96
16-Q4	0.91
17-Q1	0.95
17-Q2	0.91
17-Q3	0.92
17-Q4	0.87
18-Q1	0.80
18-Q2	0.77



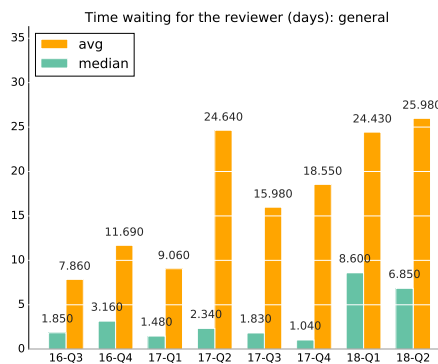
Period	(Aband. and Merg.)/Subm.
16-Q3	0.95
16-Q4	0.89
17-Q1	0.93
17-Q2	0.89
17-Q3	0.91
17-Q4	0.92
18-Q1	0.91
18-Q2	0.95



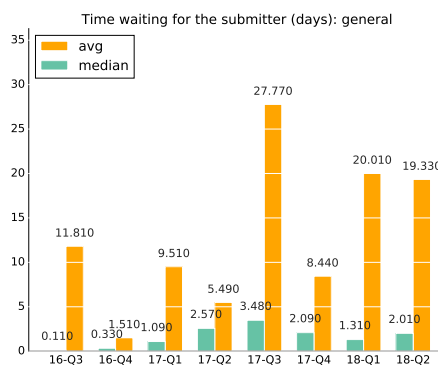
Period	Median	Mean
16-Q3	0.53	3.43
16-Q4	0.93	3.91
17-Q1	0.75	4.71
17-Q2	1.13	5.62
17-Q3	0.77	5.15
17-Q4	0.45	4.28
18-Q1	0.97	7.38
18-Q2	0.96	5.65



Period	Median	Mean
16-Q3	1.0	2.12
16-Q4	2.0	2.62
17-Q1	1.0	2.55
17-Q2	1.0	2.85
17-Q3	1.0	2.68
17-Q4	1.0	2.18
18-Q1	1.0	2.58
18-Q2	1.0	2.25



Period	Median	Mean
16-Q3	1.85	7.86
16-Q4	3.16	11.69
17-Q1	1.48	9.06
17-Q2	2.34	24.64
17-Q3	1.83	15.98
17-Q4	1.04	18.55
18-Q1	8.6	24.43
18-Q2	6.85	25.98



Period	Median	Mean
16-Q3	0.11	11.81
16-Q4	0.33	1.51
17-Q1	1.09	9.51
17-Q2	2.57	5.49
17-Q3	3.48	27.77
17-Q4	2.09	8.44
18-Q1	1.31	20.01
18-Q2	2.01	19.33

# 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 repository<sup>1</sup>.

The databases used for the analysis can be obtained from the “Data sources” panel<sup>2</sup> of the Grimoire Dashboard for the project<sup>3</sup>.

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

<sup>2</sup>[http://projects.bitergia.com/opnfv/browser/data\\_sources.html](http://projects.bitergia.com/opnfv/browser/data_sources.html)

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