

Standard Grimoire Report
OPNFV Project
2016-Q3



October 20, 2016

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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

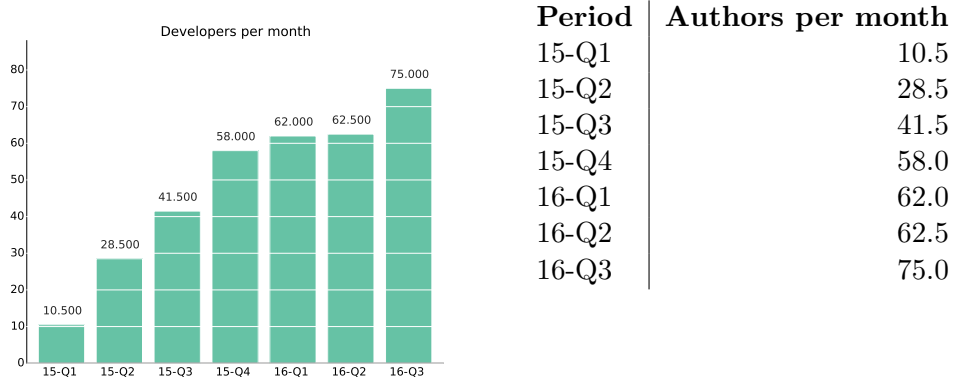
The report looks at activities across the OPNFV community during the third quarter of 2016, comparing it to previous quarters.¹.

Data source	Activity 90 days	Change (wrt to prev. 90 days)
Gits	3056 commits	68%
Tickets	1165 closed tickets	114%
Mailing Lists	2048 sent emails	-14%
Gerrit	2858 submitted reviews	42%
Askbot	24 posted questions	-45%
IRC	59285 messages	11%

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

The overall development activity has increased. Git and Gerrit activity has raised more than 40%. This increase is also in line with the Jira activity with an increase of 114%. On the other hand the communication channels keep decreasing such as 14% of mailing lists or 45% in the number of posted questions. On the other hand, IRC shows an 11% of activity increase.

¹The analyzed data sources are available in appendixB



In this quarter of 2016 the mean number of developers active per month has reached a total of 75. It is an increase when compared to the previous quarter.

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

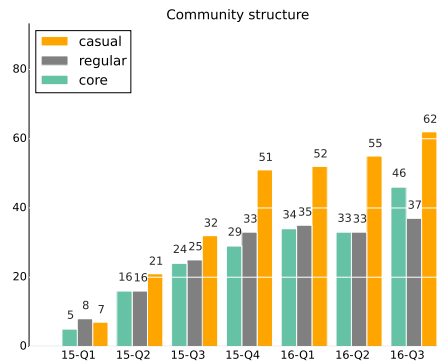


Figure 1.1: Evolution during the last quarters of core, regular and casual developers (based on git activity)

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-Q1	5	8	7
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	62

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
0.96	1.26	0.53 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)

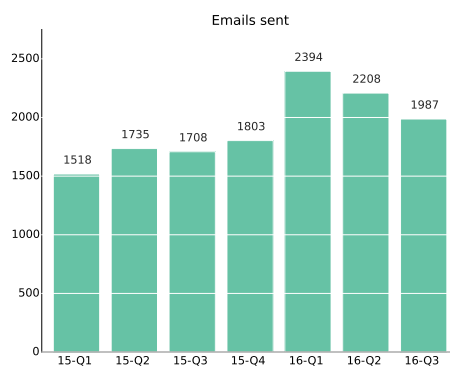
Chapter 2

Communication and support-related activities

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

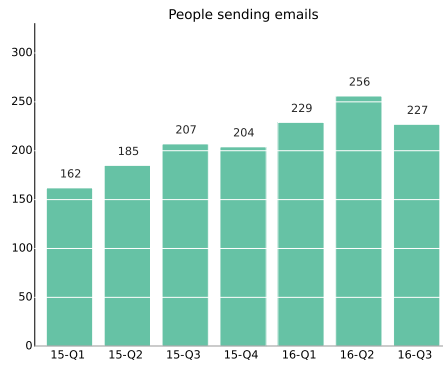
2.1 Mailing Lists

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.

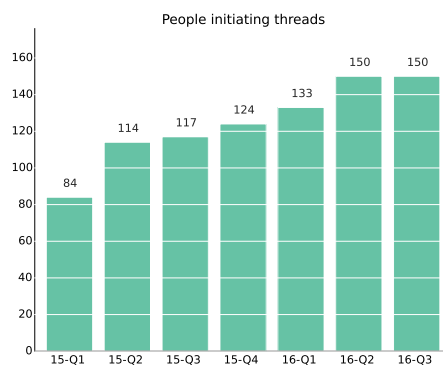


Period	Emails
15-Q1	1518
15-Q2	1735
15-Q3	1708
15-Q4	1803
16-Q1	2394
16-Q2	2208
16-Q3	1987

2.1. MAILING LISTS



Period	People
15-Q1	162
15-Q2	185
15-Q3	207
15-Q4	204
16-Q1	229
16-Q2	256
16-Q3	227



Period	People
15-Q1	84
15-Q2	114
15-Q3	117
15-Q4	124
16-Q1	133
16-Q2	150
16-Q3	150

Initial Author and Date	Subject	Number Messages
Daniel Smith 2016-08-30	[opnfv-tech-discuss] How are Documentation/Reference Projects Published in C release	25
shabrinath.motamary 2016-07-05	[opnfv-users] [opnfv-tech-discuss]RE: vIMS @Functest	22
Raymond Paik 2016-08-07	[opnfv-tech-discuss] Opening nominations for the Committers-at-Large TSC elections	20
christopher.price 2016-09-21	[opnfv-tsc] Vote by e-mail to release OPNFV Colorado 1.0 on September 22nd	20
David McBride 2016-09-08	[opnfv-project-leads] [release] D-release schedule	18
Raymond Paik 2016-08-29	[opnfv-tech-discuss] Following up on Project Health metrics discussion	17
Juraj Linkes -X jlinkes - PANTHEON TECHNOLO- GIES@Cisco 2016-07-20	[Fds-dev] Apex deployment issues on UCS-C CENGN setup	16
Juraj Linkes -X jlinkes - PANTHEON TECHNOLO- GIES@Cisco 2016-08-12	[Fds-dev] Network CRUD InterfaceService is not available	15
Prakash Ramchandran 2016-09-08	[opnfv-tech-discuss] Does any one have updates for OPNFV VNFs available for on-boarding and testing	14
David McBride 2016-08-26	[opnfv-project-leads] [release][jira] JIRA process status report	14

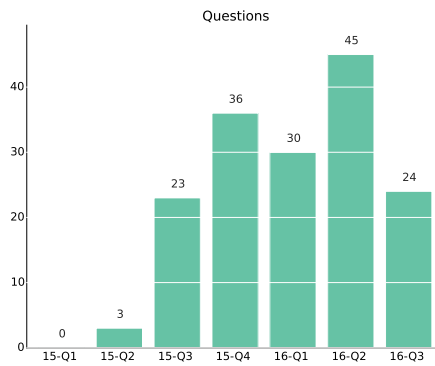
2.2 Questions and Answers

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

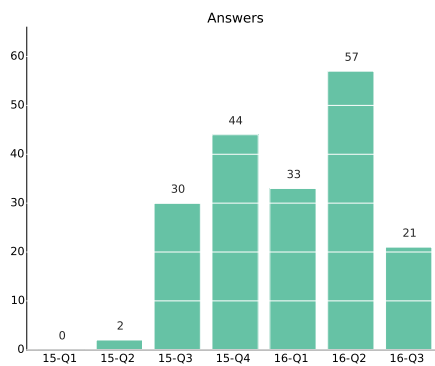
2.2. QUESTIONS AND ANSWERS



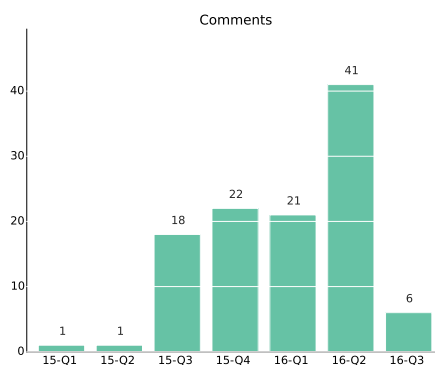
and questions with the highest number of people participating.



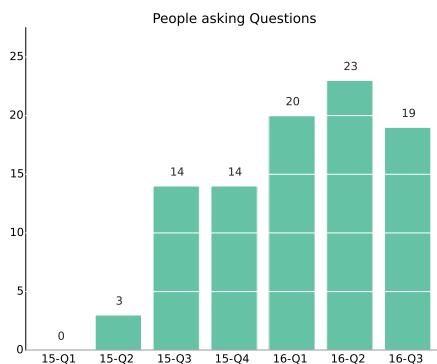
Period	Questions
15-Q1	0
15-Q2	3
15-Q3	23
15-Q4	36
16-Q1	30
16-Q2	45
16-Q3	24



Period	Answers
15-Q1	0
15-Q2	2
15-Q3	30
15-Q4	44
16-Q1	33
16-Q2	57
16-Q3	21



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



Period	People asking
15-Q1	0
15-Q2	3
15-Q3	14
15-Q4	14
16-Q1	20
16-Q2	23
16-Q3	19

- Top visited questions.

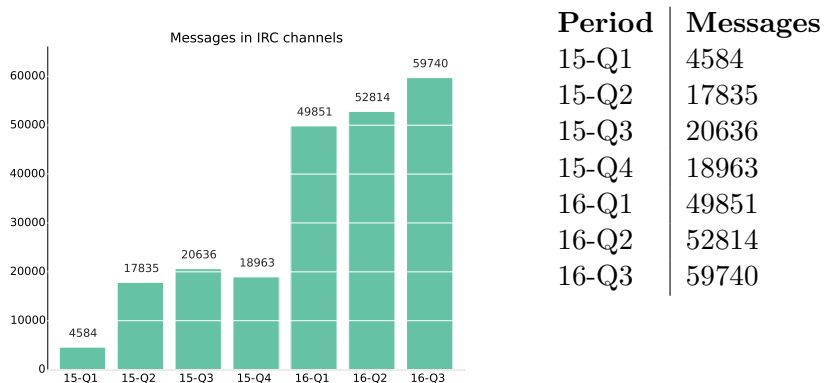
Question subject	Visits
problems compute node fuel+	1062
setting number of huge pages when+	337
enabling sahara component data processing on+	83
vping_ssh test case fails in functest+	32
requirements for opnfv installation+	15
brahmaputrafuel could not prefetch key-	13
stone_endpoint provider+	
deploy stucked when installing openstack fuel+	11
i presume that the orchestrator and+	9
unsupported nic in brahmaputra 30+	8
fail to install glance in control+	7

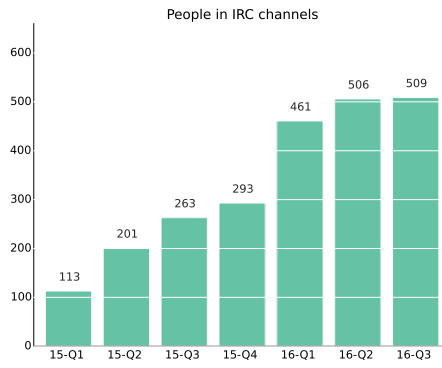
- Top questions with the highest number of people participating.

Question subject	People participating
enabling sahara component data processing on+ hardware requirements for opnfv fuel installation+	2
problems compute node fuel+ requirements for opnfv installation+	2
brahmaputrafuel could not prefetch keystone_endpoint provider+	2
failed to execute hook odl openstack+	2
what all features are supported in+	2
what is the difference between openstack+	2
setting number of huge pages when+	2
unsupported nic in brahmaputra 30+	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 7 quarters together with the number of people participating in such discussions.





Period	People
15-Q1	113
15-Q2	201
15-Q3	263
15-Q4	293
16-Q1	461
16-Q2	506
16-Q3	509

Chapter 3

Details on OPNFV development community

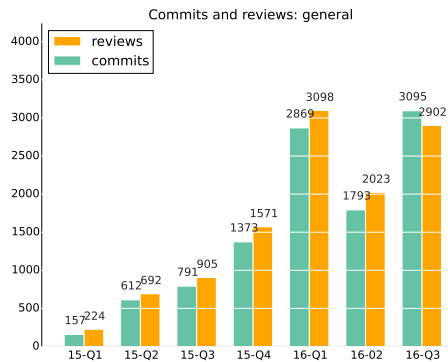
Each breakdown is divided into three sections with information from the last 6 quarters:

- 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.

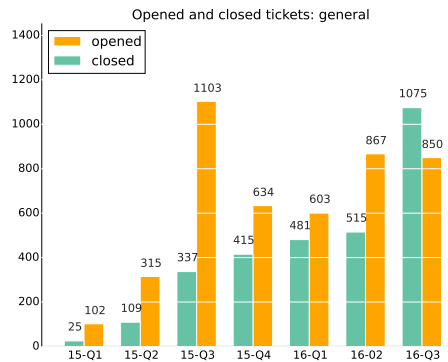
3.1 Details of the project

3.2 Activity

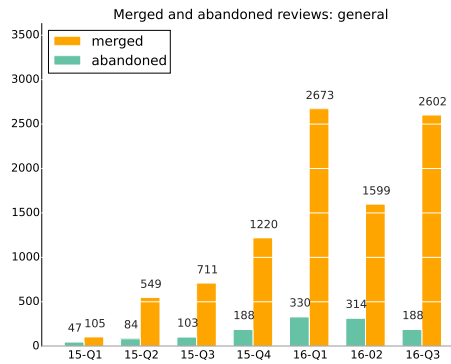
Commits in Git, submitted, merged and abandoned reviews in Gerrit and opened and closed issues in Jira.



Period	Commits	Reviews
15-Q1	157	224
15-Q2	612	692
15-Q3	791	905
15-Q4	1373	1571
16-Q1	2869	3098
16-Q2	1793	2023
16-Q3	3095	2902



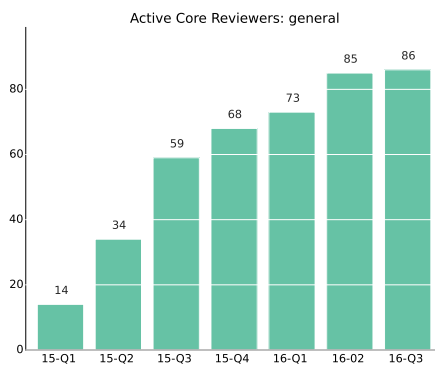
Period	Closed	Opened
15-Q1	25	102
15-Q2	109	315
15-Q3	337	1103
15-Q4	415	634
16-Q1	481	603
16-Q2	515	867
16-Q3	1075	850



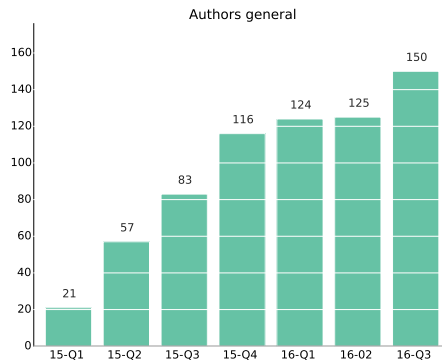
Period	Merged	Abandoned
15-Q1	105	47
15-Q2	549	84
15-Q3	711	103
15-Q4	1220	188
16-Q1	2673	330
16-Q2	1599	314
16-Q3	2602	188

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	59
15-Q4	68
16-Q1	73
16-Q2	85
16-Q3	86



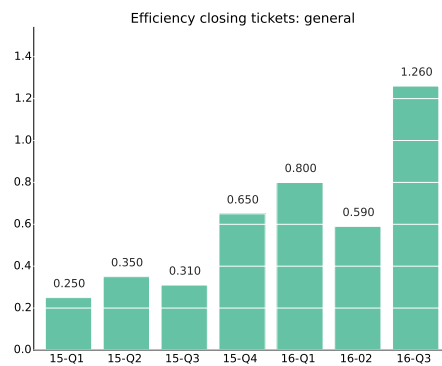
Period	Authors
15-Q1	21
15-Q2	57
15-Q3	83
15-Q4	116
16-Q1	124
16-Q2	125
16-Q3	150

Commit (s)	Author
221	liang gao
196	Morgan Richomme
185	Alexandru Avadanii
184	Tim Rozet
177	Michal Skalski
160	Jose Lausuch
147	Fatih Degirmenci
115	Narinder Gupta
108	Jonas Bjurel
102	bs3131

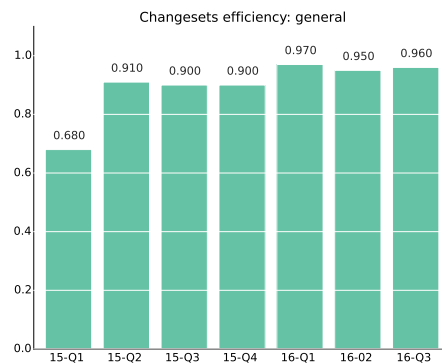
Commit (s)	Organizations
762	Huawei
658	Ericsson
442	Red Hat
373	ZTE Corporation
368	Orange
291	Intel
245	ENEA AB
216	Mirantis
146	ATT
83	NEC
56	Linux Foundation
42	Nokia
31	Cisco
13	Dell
12	EMC
8	Hewlett Packard Enterprise Co.
5	Juniper
4	SUSE
1	Tata Consultancy
1	VMWare
1	Wind River

3.4 Process

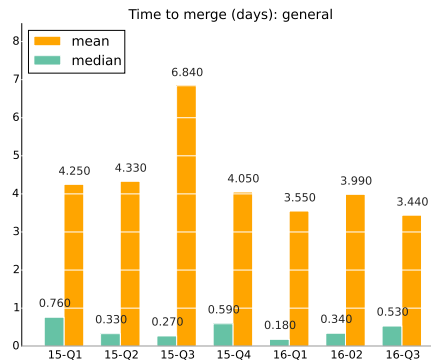
Efficiency closing changesets and tickets, time to review (mean and median), number of patchsets (iterations) per changeset and study on the time waiting for a reviewer or submitter action in the patchset review process.



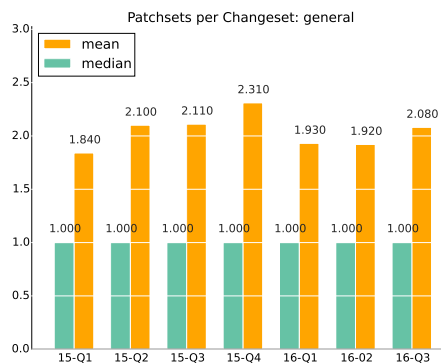
Period	Closed/Opened
15-Q1	0.25
15-Q2	0.35
15-Q3	0.31
15-Q4	0.65
16-Q1	0.8
16-Q2	0.59
16-Q3	1.26



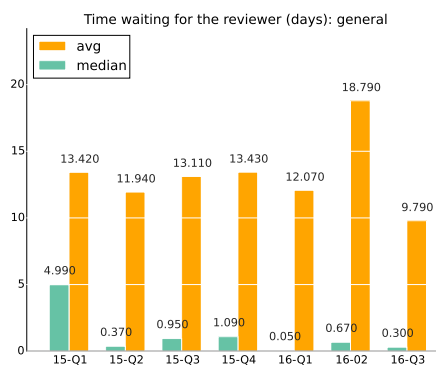
Period	(Aband. and Merg.)/Subm.
15-Q1	0.68
15-Q2	0.91
15-Q3	0.9
15-Q4	0.9
16-Q1	0.97
16-Q2	0.95
16-Q3	0.96



Period	Median	Mean
15-Q1	0.76	4.25
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	3.44

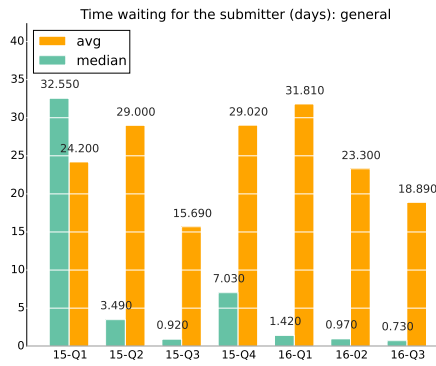


Period	Median	Mean
15-Q1	1.0	1.84
15-Q2	1.0	2.1
15-Q3	1.0	2.11
15-Q4	1.0	2.31
16-Q1	1.0	1.93
16-Q2	1.0	1.92
16-Q3	1.0	2.08



Period	Median	Mean
15-Q1	4.99	13.42
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

3.4. PROCESS



Period	Median	Mean
15-Q1	32.55	24.2
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

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/>