This report would not exist without the effort of the people involved in the development of the Grimoire toolset.
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 and communication channels. Data from previous periods is also shown for comparison.
Contents

1 Project overview 5
2 Activity 6
3 Community 6
4 Process 8
A Metrics Definitions 9
1 Project overview

The report looks at activities across the OPNFV community during 18-Q3 (2018-07-01 to 2018-09-30), comparing it to previous period of analysis.

<table>
<thead>
<tr>
<th>Data source</th>
<th>Activity last quarter</th>
<th>Change (wrt to prev. quarter)</th>
</tr>
</thead>
<tbody>
<tr>
<td>git</td>
<td>3630 Commits</td>
<td>-36%</td>
</tr>
<tr>
<td>mailing lists</td>
<td>0 Sent Emails</td>
<td>-100%</td>
</tr>
<tr>
<td>gerrit</td>
<td>1843 Closed reviews</td>
<td>-23%</td>
</tr>
<tr>
<td>gerrit</td>
<td>1806 Submitted reviews</td>
<td>-26%</td>
</tr>
<tr>
<td>jira_issues</td>
<td>363 Closed tickets</td>
<td>-60%</td>
</tr>
<tr>
<td>jira_issues</td>
<td>508 Opened tickets</td>
<td>-34%</td>
</tr>
</tbody>
</table>

Table 1: Activity during the last period of analysis and its evolution

Table 1 shows development activity for each of the analyzed data sources. The activity column displays information about the net activity numbers, while the Change column displays information about the relative difference with respect to the previous period of analysis.

Gerrit data offers an interesting view on how software development process of OPNFV community is working from the point of view of efficiency and process. To analyze this, some metrics based on Gerrit changesets and reviews are presented below. In terms of Gerrit terminology, these metrics are calculated as follows:

- Review Efficiency Index (REI), measured as the number of closed changesets out of the new ones in a given period.
- Time to Merge (TTM), measured as the time since a review is submitted until this is closed.

<table>
<thead>
<tr>
<th>REI</th>
<th>TTM</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.02</td>
<td>0.55 days</td>
</tr>
</tbody>
</table>

Table 2: Closed out of opened changesets (REI) and median time to merge (TTM)

The rest of the document is divided into three sections with information from the last periods:

- Activity: focused on contributions.
• Community: focused on contributors.
• Process: focused on efficiency and timing.

2 Activity

This section covers contributions in the different data sources.

The bar chart below shows the evolution of the number of commits and authors in Git through time, grouped by quarters.

<table>
<thead>
<tr>
<th>Period</th>
<th>Commits</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>16-Q4</td>
<td>2355</td>
<td>197</td>
</tr>
<tr>
<td>17-Q1</td>
<td>4331</td>
<td>244</td>
</tr>
<tr>
<td>17-Q2</td>
<td>4141</td>
<td>220</td>
</tr>
<tr>
<td>17-Q3</td>
<td>6712</td>
<td>255</td>
</tr>
<tr>
<td>17-Q4</td>
<td>5250</td>
<td>183</td>
</tr>
<tr>
<td>18-Q1</td>
<td>4729</td>
<td>149</td>
</tr>
<tr>
<td>18-Q2</td>
<td>4947</td>
<td>132</td>
</tr>
<tr>
<td>18-Q3</td>
<td>3630</td>
<td>107</td>
</tr>
</tbody>
</table>

Following chart shows activity in Gerrit data source. It is based on comparing the number of opened and closed reviews grouped by quarters.

<table>
<thead>
<tr>
<th>Period</th>
<th>Opened</th>
<th>Closed</th>
</tr>
</thead>
<tbody>
<tr>
<td>16-Q4</td>
<td>1908</td>
<td>1808</td>
</tr>
<tr>
<td>17-Q1</td>
<td>2971</td>
<td>2889</td>
</tr>
<tr>
<td>17-Q2</td>
<td>1922</td>
<td>1998</td>
</tr>
<tr>
<td>17-Q3</td>
<td>3379</td>
<td>3303</td>
</tr>
<tr>
<td>17-Q4</td>
<td>2916</td>
<td>2894</td>
</tr>
<tr>
<td>18-Q1</td>
<td>2390</td>
<td>2452</td>
</tr>
<tr>
<td>18-Q2</td>
<td>2288</td>
<td>2284</td>
</tr>
<tr>
<td>18-Q3</td>
<td>1806</td>
<td>1843</td>
</tr>
</tbody>
</table>

3 Community

This section tries to help us to understand the evolution of OPNFV community by looking at active contributors and organizations in the last period of analysis, compared to previous ones.
Number of active authors in Git is shown below, giving us a quick look of contributors evolution in the last quarter compared to previous ones.

<table>
<thead>
<tr>
<th>Period</th>
<th>Active Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>16-Q4</td>
<td>197</td>
</tr>
<tr>
<td>17-Q1</td>
<td>244</td>
</tr>
<tr>
<td>17-Q2</td>
<td>220</td>
</tr>
<tr>
<td>17-Q3</td>
<td>255</td>
</tr>
<tr>
<td>17-Q4</td>
<td>183</td>
</tr>
<tr>
<td>18-Q1</td>
<td>149</td>
</tr>
<tr>
<td>18-Q2</td>
<td>132</td>
</tr>
<tr>
<td>18-Q3</td>
<td>107</td>
</tr>
</tbody>
</table>

In addition, table below offers a quick glance to the most active authors in Git in the whole period of time shown in the bar chart above.

<table>
<thead>
<tr>
<th>Author</th>
<th>Commit (s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cedric Ollivier</td>
<td>698</td>
</tr>
<tr>
<td>Tim Rozet</td>
<td>401</td>
</tr>
<tr>
<td>Alexandru Avadanii</td>
<td>368</td>
</tr>
<tr>
<td>Trevor Bramwell</td>
<td>168</td>
</tr>
<tr>
<td>Fatih Degirmencı</td>
<td>145</td>
</tr>
<tr>
<td>Rodolfo Alonso Hernandez</td>
<td>145</td>
</tr>
<tr>
<td>Aric Gardner</td>
<td>125</td>
</tr>
<tr>
<td>Dan Xu</td>
<td>114</td>
</tr>
<tr>
<td>huangxiangyu</td>
<td>90</td>
</tr>
<tr>
<td>Michael Polenchuk</td>
<td>89</td>
</tr>
<tr>
<td>Yang (Gabriel) Yu</td>
<td>78</td>
</tr>
<tr>
<td>Georg Kunz</td>
<td>70</td>
</tr>
<tr>
<td>rexlee8776</td>
<td>61</td>
</tr>
<tr>
<td>Markos Chandras</td>
<td>59</td>
</tr>
<tr>
<td>m00133142</td>
<td>59</td>
</tr>
<tr>
<td>wenjuan dong</td>
<td>57</td>
</tr>
<tr>
<td>Manuel Buil Mur</td>
<td>53</td>
</tr>
<tr>
<td>Serena Feng</td>
<td>38</td>
</tr>
<tr>
<td>Jamo Luhrsren</td>
<td>37</td>
</tr>
<tr>
<td>Emma Foley</td>
<td>34</td>
</tr>
<tr>
<td>Mark Beierl</td>
<td>33</td>
</tr>
</tbody>
</table>

In a similar way, table below shows the same information groped by organization instead of author.
<table>
<thead>
<tr>
<th>Organization</th>
<th>Commit (s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Orange</td>
<td>711</td>
</tr>
<tr>
<td>Red Hat</td>
<td>474</td>
</tr>
<tr>
<td>Huawei</td>
<td>463</td>
</tr>
<tr>
<td>ENEA AB</td>
<td>429</td>
</tr>
<tr>
<td>Intel</td>
<td>333</td>
</tr>
<tr>
<td>Ericsson</td>
<td>295</td>
</tr>
<tr>
<td>Linux Foundation</td>
<td>293</td>
</tr>
<tr>
<td>Unknown</td>
<td>134</td>
</tr>
<tr>
<td>ZTE Corporation</td>
<td>120</td>
</tr>
<tr>
<td>Mirantis</td>
<td>89</td>
</tr>
<tr>
<td>SUSE</td>
<td>59</td>
</tr>
<tr>
<td>Nokia</td>
<td>57</td>
</tr>
<tr>
<td>Dell</td>
<td>35</td>
</tr>
<tr>
<td>ARM</td>
<td>27</td>
</tr>
<tr>
<td>AT&amp;T</td>
<td>22</td>
</tr>
<tr>
<td>CableLabs</td>
<td>19</td>
</tr>
<tr>
<td>NEC</td>
<td>15</td>
</tr>
<tr>
<td>Kontron</td>
<td>14</td>
</tr>
<tr>
<td>Cisco</td>
<td>12</td>
</tr>
<tr>
<td>Freescale</td>
<td>10</td>
</tr>
<tr>
<td>Wipro</td>
<td>9</td>
</tr>
</tbody>
</table>

4 Process

This section intends to show the evolution of efficiency and timing when dealing with tasks related with code review processes.

For Gerrit data source, we use REI, that was defined in section 1, to measure the efficiency in code review process. Chart below shows evolution of REI by quarters in order to visualize how changesets are being managed by the community.
In terms of time and again for Gerrit, the chart below shows the evolution of mean and median times—in days—to close a review (TTM, defined in section 1).

<table>
<thead>
<tr>
<th>Period</th>
<th>Closed/Subm.</th>
</tr>
</thead>
<tbody>
<tr>
<td>16-Q4</td>
<td>0.95</td>
</tr>
<tr>
<td>17-Q1</td>
<td>0.97</td>
</tr>
<tr>
<td>17-Q2</td>
<td>1.04</td>
</tr>
<tr>
<td>17-Q3</td>
<td>0.98</td>
</tr>
<tr>
<td>17-Q4</td>
<td>0.99</td>
</tr>
<tr>
<td>18-Q1</td>
<td>1.03</td>
</tr>
<tr>
<td>18-Q2</td>
<td>1.00</td>
</tr>
<tr>
<td>18-Q3</td>
<td>1.02</td>
</tr>
</tbody>
</table>

### 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 changesets**: a code review 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. A submitted code review is defined as any changeset submitted to the Gerrit system.

- **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 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 out of the total number of new changesets in a given period.

- Time to Merge: this time consists of the time between the first upload of the first changeset till the last iteration of the code review process is merged into the code. This metric is provided in number of days.

- Developer per period: average of developers per period ignoring bots and merges.

- 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.