Open Source Networking Development: The Useful, The Scrap Heap, The Broken

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A Brief History of Networking

“For every thing, there is a season...”
Fast Forward ...
Open Source Is Eating the World

https://medium.com/@_jogy_/open-source-is-eating-the-world-e6aa105488eb
https://medium.com/@yusufhussain/software-is-eating-the-world-open-source-is-eating-software-how-do-we-fill-the-skills-gap-717e9e9c4f38
A pragmatic view of open source

We contribute to a project...

... and others contribute to a project, with common goals...

... and everyone’s problem is solved sooner.
But where do I start?
The Hype Cycle Of Open Source Networking Development

- Packet Precipitate
- Feed Box of Disaffection
- Tilt of Understanding
- Crest of Puffed Up Contributions
- Mesa of Assimilation
The Hype Cycle Of Open Source Networking Development

Peak excitement can be very peaky, and it does not guarantee overall success.
After the excitement, people move on to other newer, more exciting projects.
If the project solves problems and has value, it will recover and become long term sustainable. But if it doesn’t, it will never emerge from the trough.
The Hype Cycle Of Open Source Networking Development

Visibility

Time

Open Source Routing
A Project of The Network Device Education Foundation

P4.org
Open vSwitch
DPDK
DATA PLANE DEVELOPMENT KIT
What Does It Mean To Be “Useful”

● Does it help me? Does it do what I need? Does it work?
  ○ If not, how sure am I that it will work one day?
● Can I make it better?
● Can I fix it?
What Does It Mean To Be “Broken”

● Does it have a diverse community?
  ○ If it has one committer or source of committers, what happens when they get bored?
  ○ Does one committer gatekeep all commits or demand special IP rights?

● Does the community value my contributions?
  ○ If not, can I be certain I will never have to change it?

● Is it going in the right direction?
What Does It Mean To Be On the “Scrap Heap”

- The project has run its course and is no longer useful.
- It picked the wrong problem to solve
  - ... or the problem has changed.
- Developers have left the project and moved on to the new hotness so there is no longer a community to help add value.
Choosing projects that aren’t broken or on the scrap heap
Culture Is Important

- How easy is it to contribute to the project?
- Is there a code of conduct to handle bad actors, amongst others?
- Does the project have downtime?
  - *The difference between volunteering and thinking you’ve signed a lifetime contract.*
- Is it dominated by a single source of commits?
  - What happens when they lose interest?
Does It Do What I Want And Need?

- How useful is the project?
- Is the project ready for me to deploy and use?
- Is the project in development, but moving in the direction I want?
Project Direction Is Important

- Where is the project on the curve?
- Does it have a roadmap which matches my own roadmap?
  - Maybe it’s close but not quite the same … ok. Maybe I can help with that.
- How quickly does the project release new code?
Release and Versioning

- The most important thing about a project: Repeatability
- How often do they release?

Continuous Testing

- Continuous testing has to happen, hard stop.
  - On each commit? On each release?
  - Of lots of important things? Or one test for British English spelling?
- Bonus points: Does it test across repositories and with other projects?
Contributing To Open Source Networking: Being Part of the Solution Rather Than the Problem
Contributing:  Two Ways
“I want to contribute, please help me!”

“Your project is too hard to contribute to.”
“I want to contribute, please help me!”

- Open Source Networking Projects need more than code!
  - Documentation
  - QA
  - Infrastructure
  - Blogs
  - IRC

- But reliably tested and working code is still important
“I found a bug!”

“I am gonna complain about it, but I won’t tell you what it is!”
“I found a bug!”

- **Report the bug in the project's bug tracker**
  - Include all relevant information
  - Include steps on how to reproduce
  - Hardware you used
  - Network topologies being used

- **Wait**
  - Projects work through their bug backlog in different ways
  - If no word heard after a week, poke developers on IRC, Slack or the mailing list
“I found a bug and I have a fix for the bug!”

“You’re not merging my bug fix fast enough!”
“I found a bug and I have a fix for the bug!”

- **Report the bug in the project's bug tracker**
  - Include all relevant information
  - Include steps on how to reproduce
- **Post the patch**
  - Ensure the patch passes whatever CI the project uses
  - Respond in a timely manner to comments from reviewers
  - Be thorough:
    - consider regressions, upgrade/performance implications, etc.
“I have a fancy new feature based on the latest IETF draft!”

“You must accept my new feature based on the latest IETF draft!”
“I have a fancy new feature based on the latest IETF draft!”

- Is the project interested?
  - Does it align with the project's goals?
  - Is it within scope of the project?
- Add the feature to the project’s roadmap
  - Projects track these in different ways
  - Listen to feedback from other contributors
“I have a great project idea! Let's work together to figure out how to address common goals.”

“I have a great project idea! Can I replace you entirely but still be considered part of the same community?”
I have a great project idea! Let's work together to figure out how to address common goals.

- Evaluate how your project idea can fit with the existing project
  - Does it overlap?
  - Does it provide extra value?
  - Can something be abstracted?
- Is the community interested?
  - Does it fit the communities goals?
  - Do you have a plan for testing, documentation and support?
“Open Source networking is strategic, and I’d like to use it in my project.”

“We plan to leverage Open Source networking software.”
“Open Source networking is strategic, and I’d like to use it in my project.”

- Evaluate the upstream project and how you can integrate it
  - How strategic is it?
  - What value can you provide back for the value you’re receiving?
“I want to start a new Open Source Networking project!”

“Let's get it on the conference track as soon as we can!”
“I want to start a new Open Source Networking project!”

- Focus on quality over splashy presentations!
  - Is it clearly written down what the project is?
  - Is there a clearly understood architecture document?
  - Have you written working code, with a robust CI/CD system, focusing on deployment and operations?
Comparing Open Source Contributions: FD.io, Istio, and Calico
## Project Communication

<table>
<thead>
<tr>
<th>Project</th>
<th>Mailing Lists</th>
<th>IRC / Slack</th>
<th>Other?</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Project 1</td>
<td>Found <a href="#">here</a></td>
<td>IRC, found <a href="#">here</a></td>
<td><a href="#">Weekly meetings</a></td>
</tr>
<tr>
<td>Project 2</td>
<td>Discussion board found <a href="#">here</a></td>
<td>Slack, found <a href="#">here</a></td>
<td><a href="#">Other ways to get involved</a></td>
</tr>
<tr>
<td>Project 3</td>
<td>Found <a href="#">here</a></td>
<td>Slack and #calico on Freenode</td>
<td><a href="#">Project Calico community</a></td>
</tr>
</tbody>
</table>
# Infra and Docs

<table>
<thead>
<tr>
<th>Project</th>
<th>Infra</th>
<th>Docs</th>
<th>New Contributors Docs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gerrit.io</td>
<td>Gerrit</td>
<td>Mostly on readthedocs.io</td>
<td>Yes, but spread across website and youtube</td>
</tr>
<tr>
<td>GitHub</td>
<td>GitHub</td>
<td>Mostly in-tree docs and devref, some wiki articles remain</td>
<td>Yes</td>
</tr>
<tr>
<td>GitHub</td>
<td>GitHub</td>
<td>Wiki articles</td>
<td>Yes</td>
</tr>
</tbody>
</table>
### I Want to File a Bug

<table>
<thead>
<tr>
<th>Project</th>
<th>Where To Go</th>
<th>Where Bug Tracked</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>🚀</td>
<td>Wiki has instructions</td>
<td>Jira</td>
<td>Excellent instructions</td>
</tr>
<tr>
<td>🚀</td>
<td>GitHub Issues</td>
<td>GitHub Issues and PRs</td>
<td>More instructions found <a href="#">here</a></td>
</tr>
<tr>
<td>🐯</td>
<td>GitHub Issues</td>
<td>GitHub Issues and PRs</td>
<td>Not obvious when searching</td>
</tr>
</tbody>
</table>
# I Want to Add a Feature

<table>
<thead>
<tr>
<th>Project</th>
<th>Where To Go</th>
<th>Where Feature Is Tracked</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>io</td>
<td>Mailing list</td>
<td>Mailing list and Jira</td>
<td>Discussions also happen on IRC</td>
</tr>
<tr>
<td></td>
<td><strong>Discussion board</strong></td>
<td><strong>PRs in GitHub</strong></td>
<td><strong>Like newer most CNCF projects, Slack is critical here</strong></td>
</tr>
<tr>
<td></td>
<td>and <strong>Slack</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>calico</td>
<td>Mailing lists and slack</td>
<td>PRs in GitHub</td>
<td>IRC also an option</td>
</tr>
</tbody>
</table>
## Project Evolution

<table>
<thead>
<tr>
<th>Project</th>
<th>Started</th>
<th>Evolved To</th>
<th>Foundation</th>
</tr>
</thead>
<tbody>
<tr>
<td>vxlan.io</td>
<td>Seeded with VPP technology from Cisco</td>
<td>Squeezing more out of less, but with various control planes</td>
<td>Linux Foundation</td>
</tr>
<tr>
<td>Project Calico</td>
<td>Started by Google, IBM and the Envoy team from Lyft</td>
<td>“Service Mesh of the Moment”</td>
<td>None, <a href="http://www.google.com">Google CLA</a> required to contribute code</td>
</tr>
<tr>
<td></td>
<td>Began life as pure L3 networking for OpenStack, written in Python</td>
<td>Pure L3 for bare metal, VMs and containers re-written in golang</td>
<td>No, <a href="http://www.changes-list.org">CLA</a> required for PRs</td>
</tr>
</tbody>
</table>
Practical Advice on Succeeding Upstream
Pick the Correct Project
ALWAYS PLAN AHEAD

https://www.flickr.com/photos/eddale/6925936070
respect and diversity in our community
CURB YOUR EGO
A LIFE LIVED FOR OTHERS
IS A LIFE WORTHWHILE.

https://www.flickr.com/photos/mckaysavage/3986896319
It's the little things in life that matter the most. Appreciate what you have. Be grateful.

LiveLifeHappy.com
Empower your Open Source Developers!

https://www.pinterest.com/rodialovit/empower-people/
Be Excellent To Each Other!

Thank you!