

# Practical Course – Contributing to an Open-Source Project

## Preliminary Report

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Zulip is a hundred percent open source full-featured group chat that aims to increase productivity of teams that use it. According to the project’s creator and lead developer Tim Abbott, it has one of the most fascinating histories for an open source project.<sup>[1]</sup> The group chat is used by thousands of teams and is known to have a highly welcoming community for contributors.

## 1 History

### 1.1 Origin

Zulip’s story goes back to 2008, when four MIT students were working on the Ksplice software, which allows users to live-patch a running Linux kernel. The software is based on the master’s thesis authored by Jeff Arnold and is provided under an open source license.<sup>[2]</sup> Jessica McKellar, Tim Abbott and Waseem Daher joined forces with him in order to develop the software further.<sup>[3][4][5]</sup> In June 2008, they founded the company Ksplice, Inc. whose business model was to maintain the software and provide support for it.<sup>[6]</sup>

At the time, Ksplice’s founders were using an instant-messaging system called BarnOwl for internal communications. BarnOwl was a client that implemented the Zephyr protocol, one of the first IP-based chat protocols built in the late 80s which was hugely

popular at MIT.[7][1] BarnOwl's powerful user interface made it easy to read and write hundreds of messages a day, which meshed well with the Ksplice team's need for a highly productive tool. However, being a curses-based client normally run in a screen session, it was inaccessible to non-technical users.[8] The four founders saw an opportunity in that, and they started considering building a modern group chat tool that retains the benefits of BarnOwl but is usable for everyone.[1]

## 1.2 Founding Zulip, Inc.

In 2011, Ksplice was acquired by Oracle Corporation due to its great success.[6] The founders continued their work at Oracle for around a year before all four founded Zulip, Inc. together in August 2012 to work on their group chat idea.[4] At this point it was not an open source project, but just an ordinary for-profit startup. The founders chose the name Zulip because they wanted a free .com domain, easy spell-able and easy pronounce-able. Even though in their eyes all the best names were already taken, they were quite happy to have found a five letter domain.[1]

After one and a half years, they already had a beta version of the application and had gained a thousand users. Similarly to Ksplice, the company was unexpectedly acquired by another company: this time it was Dropbox. [9] McKellar, Abbott, Arnold and Daher joined Dropbox, but none of them continued working on Zulip after the acquisition.[9] Surprisingly, even though Dropbox did not actively maintain the group chat, most of the users stayed. Most who tried switching to other services like Slack ended up coming back to Zulip after a while.[1] Tim Abbott was pleasantly surprised by the users' loyalty and felt encouraged to work on the project again.

## 1.3 Open sourcing Zulip

Abbott tried to find a solution with Dropbox to revive development of Zulip so that users can have an up-to-date version. He worked out a plan to open source the software and Dropbox graciously agreed.[9] Dropbox organized a hack week in 2015, which was used to get the codebase ready for publishing. In September 2015, Tim Abbott announced the upcoming release of Zulip as an open source project under the Apache license, which then took place towards the end of the year.[10][9] Interestingly, this announcement was very popular and around 200,000 people read the blog post.[1]

One year later, the project already had more than 150 contributors and was moving

faster than when the original startup had 11 full-time engineers. Zulip participated in the PyCon sprints in 2015 and 2017, a big milestone for any Python project.<sup>[9]</sup> The open sourcing of Zulip was a great move for the project, and that is still true today. Dropbox no longer has any involvement in the project beyond being mentioned in the license.

## 1.4 Commercial (re-)launch

In Spring of 2016, Tim Abbott decided to leave Dropbox and dedicate himself full-time to Zulip.<sup>[11]</sup> A few months later, he founded Kandra Labs, Inc. to steward and financially sustain Zulip's development. The company launched a hosted Zulip server at zulip.com and an enterprise support product for on-premise deployments in 2017.<sup>[9]</sup> Ten people list Kandra Labs as their employer on LinkedIn.<sup>[12]</sup>

## 2 Motivation

One might ask: why do we need yet another group chat? Tim Abbott has a clear answer for that: many chat applications are not optimized for productivity; Zulip is. Take Slack as an example. As channels get larger, it becomes hard to follow different discussions at the same time, due to the lack of organization and context. Slack users have to scroll through hundreds of messages to find the relevant content for them. It has been shown that many executives in a company do not read their channel messages. This seems problematic: what is the purpose of a company communication tool if key company decision-makers do not use it? This is not only a problem for busy managers, but also for remote workers. Due to different time zones they cannot react to channel messages right away but have to go through the whole unsorted block that has been building up during the day.<sup>[13]</sup>

Zulip's goal is to make group chat productive. Every channel message has a topic, similar to the subject of an email. Topics group all messages so that users can effectively process them, allowing different discussions to smoothly coexist inside one channel. The Zulip developer community itself uses Zulip to communicate effectively even with channels that have 16,000 members. Additionally the users productivity is increased by useful keyboard shortcuts, a lot of integrations with external services, markdown formatting is supported and many other features.<sup>[13][14][15]</sup>

## 3 Structure

### 3.1 Governance structure

Tim Abbott is the lead developer and his employees at Kandra Labs can be considered the core team. The code is hosted on GitHub and has almost 13,000 stars. The core team is mainly responsible for leadership in the community and to approve pull requests. 59 PRs have been merged in November 2020, 41 of which were approved by Tim Abbott himself and the others by three other Kandra Labs employees.[16] Newer volunteers who have a few contributions under their belt but do not have merge rights yet can still contribute to the project by reviewing code or answering questions in the community chat.

Keeping the maintenance effort of the project low has always been a priority. From early on, Abbott mainly responded to questions by writing documentation to answer the question and then just sending the link. As a result, the developer documentation already had 100,000 words by 2017, now increased to 150,000.[1][17] Also, most of the discussions between developers are visible to everyone in the community Zulip chat, so that everyone can benefit from them. The chat has a large amount of channels and topics, which might seem overwhelming at first, but it also allows you to find specific information much faster as well as reaching the right people for your question.

Another way that Zulip makes life easier for its maintainers is the use of continuous integration tests for every pull request. Until all of them are passed, the code will not be reviewed. It is also worth mentioning zulipbot which automates processes like assigning labels and people to Issues.

Zulip as open source software relies on an active contributor community for its existence. In a recent interview, Abbott said that he thinks of the contribution process as a part of the product he builds.[18] This can also be seen in many practical aspects like the fast set-up of the development environment, good code readability, and most importantly fast response times.

### 3.2 License

Zulip is licensed under the Apache License Version 2.0. The copyright belongs to Dropbox, Inc., Kandra Labs, Inc., and the contributors.[19]

### 3.3 Funding

When the project was open sourced in 2015, Tim Abbott was still employed at Dropbox. Accordingly, he only had the nights and weekends for Zulip, but also still earned a salary. Soon this became unsustainable which was one of the main reasons Tim Abbott left Dropbox. He mentioned in an interview that during that time it was not strictly necessary for him to earn a salary because he had sold two startups within the last years and his wife had a well-paid job.[1] Regardless, Abbott still founded a Kandra Labs to financially sustain Zulip.

The US National Science Foundation has funded Kandra Labs with nearly \$1M in Small Business Innovation Research grants.[9] The funding is especially founder-friendly and does not influence the direction of the funded companies. The highest funding is up to \$1M which is distributed over two years.[20] Only commercial businesses may apply, which means that Zulip as an open source project would not have been eligible by itself.

In line with Tim Abbott's values, Zulip is not only open core but 100% open source. Nevertheless, they charge for many of their products. Zulip offers a Free and Standard plan on Zulip Cloud, which is the server hosted on zulip.com. The Free plan has a search history limit of 10,000 messages, while Standard keeps full search history for a monthly fee per active user. Zulip additionally offers two on-premise plans, Community Support (free) and Enterprise. Non-profits, educational institutions, and even groups of friends get steep discounts (usually 85%-100%).[21] For any open source project, all Zulip products are free of charge.[22]

Yet another source of support is Google Summer of Code (GSoC) and Google Code-in. GSoC is a 16 weeks long program administered by Google to promote open source development among students. They pay their students up to \$3300 for these four months.[23] Since 2016, Zulip is a mentoring organization for GSoC and targets 10-20 students every year.[17] Zulip has to provide mentors for every student but also benefits greatly from getting talented people to contribute. In contrast to GSoC, Google Code-in is a program for pre-university students of age 13-17 which aims to introduce them to open source.[24] Hundreds of participants of Google Code-in were mentored by Zulip, and quite a few of them are now major contributors to the project.[17]

Zulip also uses GitHub Sponsors, a feature that allows people to contribute money to the project, but so far that has not been a successful source of funding.[25]

## 4 Releases

Zulip releases a new version every few months, usually with a lot of new features and fixes. The next version will be 4.0 and its feature log, upgrade notes and highlights are already published in the documentation.<sup>[26]</sup> A week before a new release all Python packages are being updated, strings translated, a list of bugs created that still need to be fixed and a blog post drafted. For the execution of the release a commit is created on the master branch for major releases or on the release branch for minor ones. It gets tagged with the release number. Finally the tag and release commit are being pushed to make the release happen. The blog post will then get published, a tweet sent, a post done in the “#announce” channel in the Zulip community chat and people on the mailing list will get informed via email. For the next release a new release branch will be created.<sup>[27]</sup>

## 5 Contributing

### 5.1 Managing contributions

Zulip is famous for its great community of contributors. The CONTRIBUTING.md file is written well and there is a lot more information on the documentation page. Generally everyone is welcome to make a contribution, either as code or by reporting an issue, giving feedback, translating or outreach. Some of the work of managing contributions is done by zulipbot. If you want to work on an Issue, you can write “@zulipbot claim” in the comments, which will automatically assign you to the Issue and attach the “In progress” label. If you do not make a pull request or reference the issue in a comment, you will get unassigned after 14 days. For your first contribution, zulipbot will only assign you to Issues that are labeled with “Help wanted” or “Good first issue”. Otherwise, you can work on any Issue.<sup>[28]</sup>

When your code is ready, you can make a pull request. The code will be subjected to automatic checks, and will only be reviewed after all those checks are passed. It is recommended to @mention in the PR the person that should review your contribution or write in the Zulip community chat. The reviewer does not need to have any special permission; it can be anyone who already contributed to the project.<sup>[29]</sup>

Merging the PR to the master branch can only be done by a limited set of contributors. There is no publicly available information about who exactly has those merge rights, but it seems to be limited to Kandra Labs employees.

## 5.2 Contribution history

Tim Abbott is by far the most active developer of Zulip with almost 9,000 commits. However, Zulip has a large and active contributor base beyond Abbott. Over 600 people have contributed to the project so far, and over 60 of those have more than 50 commits.[30]

## 5.3 Internal communication

For internal communication, Zulip uses GitHub’s issue tracker and the community Zulip chat.[31][32] While Issues are only used for describing tasks and assigning contributors, all further discussions are done in the Zulip chat. Channels like “#new members”, “#development help” and “#code review” are useful resources to gather information and ask questions. Other channels like “#checkins” are rather dedicated to share some personal information and life updates. This fosters team spirit and is useful for figuring out whether someone will be offline for a while.

The main repository includes a code of conduct, but apparently Zulip has such a welcoming and friendly community that it rarely attracts troublemakers. During the first one and a half years, there has not been a single violation of the code of conduct and it does not seem that this has changed over the last years.[1]

## 6 Users of the project

Zulip is used by a variety of people, many open source projects, some Fortune 500 companies and large standards bodies.[31] A few well-known users are Akamai, Wikimedia Foundation, MariaDB Foundation, Dr. on demand, Level up, Recurse Center, Cambridge Mobile Telematics, Layershift and Panjina.[33] Many users benefit from more than 110 native integrations with external services and the optimized channel structure. Every user is also free in implementing their own integration if needed.[34]

Zulip is also used at TUM. According to a survey in the Informatics department this summer, 36% of the students have used Zulip as a group chat for university. RocketChat and Slack were just a few percent ahead.[35]

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