GitLab

Preliminary Report

Contributing to an Open-Source Project
Practical Course WiSe 2020/21

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Terminology

GitLab is a large application, it consists of multiple components, many of them managed in their own dedicated Git repository.[1]

In this report, "GitLab" and "GitLab project" always refer to the whole project, not just the "GitLab" main repository[2] or any other subcomponent of GitLab. "GitLab Inc." (or its Dutch equivalent "GitLab B.V.") refers to the company maintaining GitLab. Its employees (together with the Core Team, see 6 GitLab Inc) are referred to as "GitLab team members" or just "team members"[3], in contrast to community contributors outside the company, which are referred to as "community contributors". These naming conventions follow those usually applied on GitLab's web pages hosted on gitlab.com.

1 Introduction

GitLab is an open core[1] DevOps lifecycle software.

As its name suggests, GitLab's key functionality revolves around the management of Git repositories and is extended by issue management, security checks, continuous integration and deployment, wiki, integrated software package, container and public pages hosting, and many other features. GitLab denotes itself as "The complete DevOps platform"[4] and over the past 9 years it has effectively grown from a small team collaboration tool to a large, feature-rich software providing extensive possibilities for software lifecycle management.

The GitLab project is currently led by GitLab Inc., a company founded by the

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[1]see 7 Legal and Licensing Information

initial creators of GitLab. GitLab Inc. also provides a hosted public GitLab instance (gitlab.com)[5] based on a freemium model, with many features available free of charge, such as unlimited private repositories and contributors, but also Enterprise Edition features for public open source projects.[6]

2   Technology

GitLab is web-based, the client-side application is based on HTML, SCSS and JavaScript with the Vue.js framework, whereas server-side code is written mainly in Ruby (the initial project's language of choice)[2], with some newer components written in Go[7, 8] for performance reasons[9] and because Go projects can be compiled to a single binary[10].

GitLab's continuous integration and deployment (CI/CD) features are completely environment- and language-agnostic thanks to the GitLab Runner (GitLab's CI job executor) being able to use, among others, Docker containers or remote SSH connections for executing its jobs.[11]

3   Release Management

GitLab releases a new milestone version every month on the 22nd. The company justifies this strict release plan by the fact that it makes it easier for managers to plan with human resources and that it increases predictability for developers, system administrators and users. In addition, GitLab hereby also tries to guarantee to always appear as a lively and vivid open source project, which they regard as crucial in order to attract potential community contributors.[12, 13]

With every new release, GitLab also provides packages for the most common Linux server distributions for self-hosted installations. Furthermore, they also provide official Docker images and support hosting on cloud providers: Amazon Web Services (AWS), Google Cloud Platform (GCP), and Microsoft Azure.[14]

4   Customers and Users

Many large corporations and organizations rely on GitLab, including Goldman Sachs, NVIDIA, Ticketmaster, Siemens, Wish, Thomson Reuters, the European Space Agency (ESA), and many others.[15]

The software is also widely used by universities, especially since GitLab Inc. started to provide free Enterprise Edition subscriptions for universities and open source projects (which are comfortable running on proprietary software parts, see 7 Legal and Licensing Information) in 2018.[6]

According to its website, GitLab is currently used by more than 100,000 organizations and millions of users all around the world.[16]

5   Motivations and History

GitLab was born from Dmitriy Zaporozhets' (the current CTO of GitLab Inc.) desire to create an efficient tool for collaboration management for his team. He started working on GitLab together with Valery Sizov in 2011 and they soon finished the first features, including an issue management prototype.[17].

The name "GitLab" was influenced by GitWeb and other Git-related solutions. In 2012, the two were joined by Sid Sijbrandij (current CEO of GitLab Inc.), who inspired the young team to make their project publicly available under a free software license. They accepted and opted for the MIT Expat License. Furthermore, Sid asked Hacker News users if they were interested in using GitLab for hosting their Git repositories and got positive feedback from many of them. Dmitriy, in the meantime, created the first version of GitLab CI.

During 2013, many organizations contacted the GitLab team asking for new features, which is how GitLab started its Enterprise Edition (EE) with a paid subscription model.

In 2014, GitLab Inc. was founded and soon became a fully remote company.[18] Furthermore, the team submitted a successful application to Y Combinator, an American seed funding startup accelerator, where they participated in 2015. In March 2015, their team already consisted of 9 people and it began to grow steadily with more and more people joining to work full-time on GitLab.

In 2016, GitLab's number of contributors grew to 1,000 with more than 100,000 organizations and millions of users using the software.

As of 2020, GitLab Inc. is the largest remote-only company in the world, employing over 1,200 team members without any central headquarters or company-owned offices.[19]

6   GitLab Inc.

Team   The GitLab team consists of GitLab Inc.'s employees together with the Core Team. The Core Team is formed by volunteering members of the wider GitLab community, who have made significant contributions to GitLab in any form. The Core Team is an important interface to the wider GitLab community, as its members are in particular assigned the task of helping community contributors by triaging issues and reviewing proposed changes in merge requests.[20].

Structure   GitLab Inc. states to have six company structure layers: individual contributor, manager, director, senior leader, executive, and board member.[21] Individual contributors are regarded as "managers of one", meaning that they are largely responsible for themselves, for scheduling their work, taking responsibility for chosen or given tasks, and committing successfully while communicating with other team members, community contributors, and leaders.[22] By following this philosophy, GitLab Inc. transfers a considerable amount of

responsibility to its employees, which the company regards as a key factor for successful management in an all-remote organization.

Members belonging to higher layers are "people managers" entrusted to align the priorities of their assigned team members with the goals of the company, always following the company's values.[23][21]

GitLab team members maintain a public handbook[24] to document company processes and guidelines and follow a handbook-first approach when looking for information. This is in line with the company being international and all-remote, as the handbook can be consulted at any time, anywhere on earth.

GitLab Inc. also publishes an organizational chart with members and their corresponding reporting relations inside the company.[25]

Acquisitions   In 2013 (even before GitLab's incorporation), GitLab acquired Gitorious[26], a rivaling hosting service for Git repositories with about 822,000 registered users at that time[27].

In 2017, GitLab Inc. acquired the developer chat and networking platform Gitter and made its source code open by licensing it under the MIT Expat License. [28] Gitter remained a standalone service and was eventually sold to Element[2], the company behind Matrix[3], in September 2020. The corresponding blog post explains this decision as a step towards focusing more on GitLab's core products, while also positively shaping Gitter's future by finding a buyer with higher investment capabilities.[29]

7   Legal and Licensing Information

Source code   GitLab Inc. is following an open core approach for GitLab. The Community Edition (CE) is subject to the MIT Expat License, a well-known permissive and GPL-compatible free software license developed at the Massachusetts Institute of Technology.

GitLab's Enterprise Edition (EE), however, adds additional functionality on top of the Community Edition and the regarding source code is under a proprietary license[30] (even though it is publicly available[31]). One exception to this is the client-side (browser) code, which is completely licensed under the MIT Expat License (for both CE and EE features).[32, 30]

Regarding server-side code, the GitLab Enterprise Edition License clearly states that all of the code can only be used in production after agreeing to and when complying with the GitLab Subscription Terms of Service[33] (or any other form of agreement with GitLab Inc.). Furthermore, a valid subscription for the correct number of users is required. Given these preconditions, the subscribed entity is allowed to modify the source code. However, it is not allowed to publish, distribute, sublicense, copy or sell the software. Furthermore, all rights to the

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[2]https://element.io/
[3]https://matrix.org/

changes are granted to GitLab Inc. and/or its licensors.[30]

A thing worth noting: in the early days of the Enterprise Edition, its complete source code was licensed under the MIT Expat License. In one of the blog posts about the start of the Enterprise Edition, it was announced that its source code would not be published and that they would hope that subscribers of the Enterprise Edition would not make it publicly available.[34] After less than a year they decided to switch to a proprietary license for source code developed for the Enterprise Edition, arguing that the new licensing model would cause less confusion by being easier to understand for potential customers.[35]

Contributor License Agreement GitLab includes contributor license agreements for personal and corporate contributions in its source code repositories. They are based on those employed by the Google Open Source Programs Office.[36, 37]

By submitting a contribution, its author implicitly accepts GitLab's contributor license agreement, assures to comply with its requirements and grants copyright and patent license to GitLab B.V.[38, 39]

8   Editions

As already stated, GitLab comes in two different main editions: the free Community Edition (CE) and the paid Enterprise Edition (EE).

However, the Enterprise Edition itself also comes in different flavors which vary by number of features.

SaaS – Software as a Service GitLab Inc. hosts a large GitLab instance on gitlab.com, providing GitLab as software as a service (SaaS).[5] The corresponding editions, sorted in ascending order by number of included features, are: Free (Community Edition), Bronze, Silber, and Gold (free for universities and open source projects).

Self-hosted GitLab can also be self-hosted, which is a very attractive option many of GitLab's competitors do not provide.[40] The corresponding editions are Core (Community Edition), Starter, Premium, and Ultimate (free for universities and open source projects). They largely correspond to the SaaS editions on the same features level.

GitLab publishes an extensive list of provided features together with a list of editions including them on its website.[41]

9   Funding

Donations GitLab already started a donation campaign back in 2012[42] and soon found supporters all around the world.[43] As of today, the project does

not actively ask for donations anymore.

Investor funding rounds   In 2015, GitLab Inc. successfully raised $1.5 million in seed funding after participating in Y Combinator (see 5 Motivations and History).[44] They decided to start yearly funding rounds, the first one (series A) leading to raising $4 million still in 2015.[45] 2016's series B and 2017's series C funding rounds both led to $20 million.[46, 47] In 2018, GitLab's series D round raised $100 million[48] and they successfully managed to continue the upwards trend by raising $268 million in 2019's series E funding round[49].

Enterprise Edition subscriptions   With version 6.0 (Aug 2013), the initial GitLab project was split into a Community Edition (CE) and an Enterprise Edition (EE), the latter coming with a user-based subscription model. The accompanying blog post argues that the additional revenue generated with GitLab Enterprise Edition is needed in order to pay full-time employees' salaries.[34, 50] Enterprise Edition subscriptions can be purchased for both GitLab.com (SaaS) and self-hosted instances (also see 8 Editions).[51]
GitLab Inc. does not directly publish its revenue generated with Enterprise Edition subscriptions, but the company was expected to reach $100 million in annual recurring revenue (ARR) in 2020.[52]

10   Community Contribution Management

With GitLab being a very comprehensive project, there are multiple ways to contribute: development, documentation, translation, UX design, and project templates.[53]

Workflow   Most community contributions (contributions by members outside GitLab Inc.), especially development contributions, are managed using issues and merge requests. Contributors are advised to always start from an issue, which represents the starting point for communication with GitLab team members to find out whether the suggested changes are in line with the company plans. After choosing an issue to work on, contributors need to fork the corresponding repository and create a merge request (MR) for their fork as soon as the changes are ready (work-in-progress merge requests are also allowed). In the next step, GitLab team members (see 6 GitLab Inc) review the changes, further conceptual and code discussion is done directly on the corresponding merge request.[54]

Communication   The vast majority of communication at GitLab takes place publicly on issue and merge request pages. This applies in particular to community contributions, as they are usually not part of internal GitLab team communicaton structures.

For GitLab team members, the GitLab handbook provides very detailed communication guidelines. They regard clear and efficient communication as essential for successful operation, especially being an all-remote company. GitLab members are advised to use asynchronous and open communication by default, mainly through issues, merge requests, and Slack channels.[55]

If members have the feeling of not getting any further via asynchronous communication, personal conversations via video call are recommended. The same applies to negative feedback in general.[56]

Code of Conduct   GitLab's code of conduct[57] is an adaption of the well-known Contributor Covenant, version 1.4.[58] Contributors should always make sure to comply with it and to internalize its principles before any kind of public contribution.

11   Contribution Statistics

The following statistics refer to all GitLab repositories combined, as listed on GitLab's Bitergia Analytics page.[59]

The GitLab project in total has more than 6,700 contributors, with over 180,600 merge requests merged.

As of today, more than 3,500 (about 53%) of the contributors mentioned above are community contributors outside GitLab Inc., which together have submitted over 7,400 successful merge requests. This makes it clear that single community contributors tend to make much fewer contributions compared to GitLab team members. The same applies to the number of commits: more than 83% of all commits originate from GitLab team members.

Over the time period of the last 18 project milestone versions (12.0 - 13.6), GitLab had 966 first time community contributors (more than 53 per milestone on average).[59]

12   Relationships with other Projects

Package Dependencies   The core GitLab project alone depends on more than 2,400 Ruby dependencies[60], with similar numbers found for GitLab's other repositories. Library packages are usually licensed under permissive free software licenses which do not interfere with GitLab Enterprise Edition licensing.

Integration with other Tools and Services   GitLab includes an extensive integration ecosystem which makes it possible to let GitLab interact with external tools and services to further extend its functionality.[61]

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