What does GitLab do?

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The TL;DR

GitLab is a somewhat contrarian take on DevOps: it's basically one giant tool for literally anything you'd want to do relating to building and deploying software.

- DevOps **spans the gamut** in software, from source control to performance monitoring
- Traditionally, teams have used **different tools** for each part of the DevOps pipeline
- GitLab brings the entire process together with a **single platform** for DevOps
- **Product lines** include source control, issue tracking, CI/CD, and monitoring

GitLab is a *very* non-traditional company – beyond their unusual approach to the market, they operate completely remotely, publicly publish their internal guidelines, and are open source. They also IPOd recently, and are now worth $15B – so it's an organization worth understanding.

Refresher: what's DevOps?

Understanding GitLab means understanding DevOps, which is thankfully the subject of this recent Technically post. Here's a quick refresher if you can't be bothered to click.

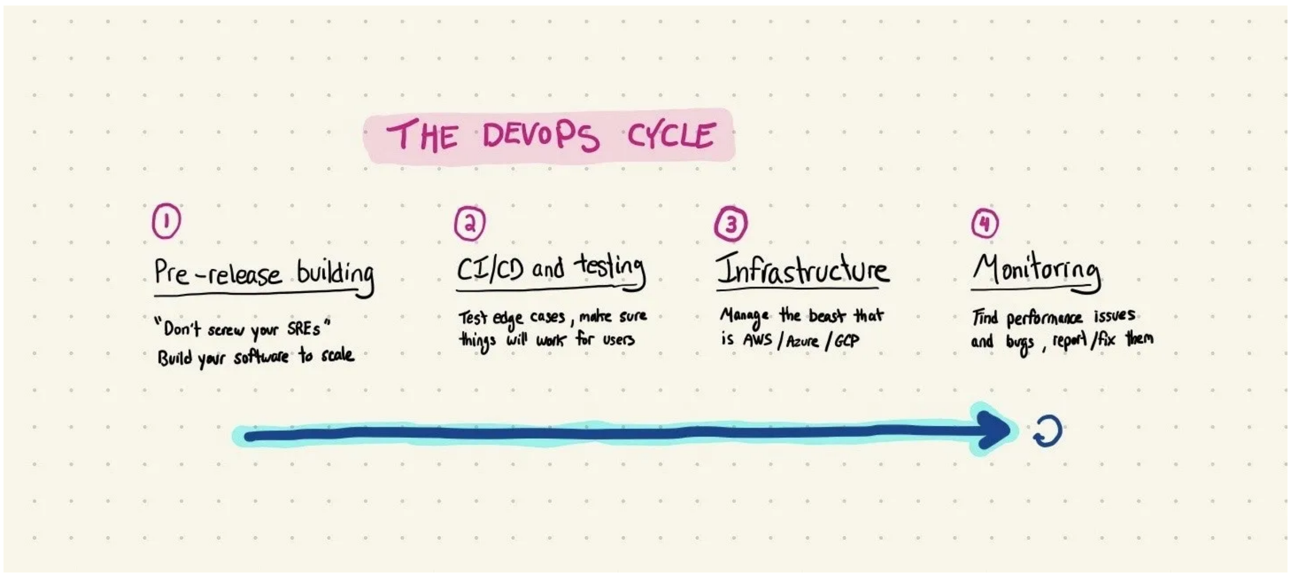
Much of the tedious process of building software is actually what happens *after* you write working code: testing that code to make sure it's going to work for your users, and then actually getting it out there into the wild, and monitoring it to make sure it's performing well. These three pieces are often categorized as:

- **CI**, or Continuous Integration – testing your code frequently
- **CD**, or Continuous Deployment – deploying your code frequently

- **APM, or Application Performance Monitoring – keeping an eye on your app's performance**

Imagine you're an engineer building a new feature for your company. You get the code working on your laptop and acting as it's supposed to. Now what? You've got two big steps left before your users can get a hold of it. First, you need to **merge that code** into the rest of the codebase, including testing it heavily across a few dimensions to make sure it doesn't break anything. Second, you need to push that updated codebase to your application's users. Finally, once it's in the wild, you want to make sure it performs well and doesn't break, for eternity.

This is basically what DevOps is, the operations of shipping software. And it's really a cycle, since this process happens all the time:


THE DEVOPS CYCLE
1
Pre-release building
"Don't screw your SREs" Build your software to scale
2
CI/CD and testing
Test edge cases, make sure things will work for users
3
Infrastructure
Manage the beast that is AWS / Azure / GCP
4
Monitoring
Find performance issues and bugs, report / fix them

A common "gotcha" when you hear the word "DevOps" – it could be referring to any number of permutations on the above idea: a philosophy, a series of tools, a process, you name it. The definition we're using here relates to workflows and tooling, which is the one you need to understand GitLab.

GitLab's philosophy: one stop shop

With that in mind, it's pretty easy to understand what GitLab does – they provide tools for **every step** of the DevOps process, from issue tracking to monitoring.

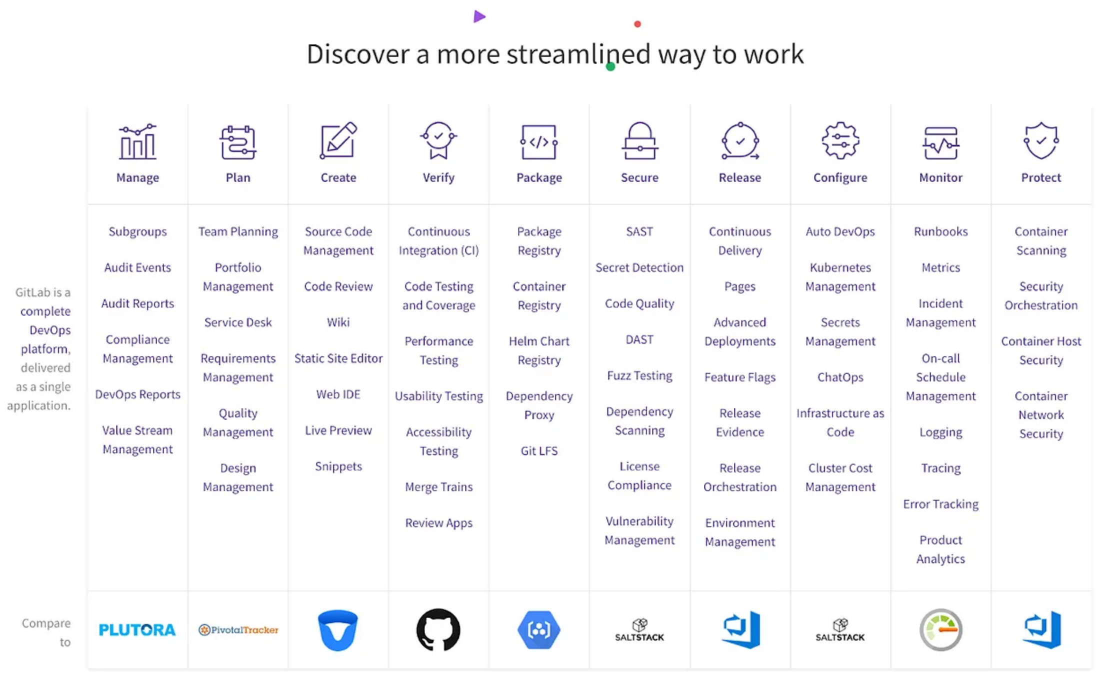
The norm – for sure at small to medium size companies – is that each part of this DevOps workflow requires a disparate tool. A normal stack might look something like this:

- *Issue tracking*
  - **What it is**: project management software for software engineering. Keep track of bugs and new features to build.
  - **What companies use**: JIRA, Linear, Shortcut
- *Source control*
  - **What it is**: hosting for your code, with features around branching and merging.
  - **What companies use: GitHub, Bitbucket**
- *CI/CD*
  - **What it is**: testing and deploying your code frequently and securely.
  - **What companies use: (too many to name) CircleCI, Jenkins, TravisCI, Harness, JFrog, etc.**
- *Monitoring*
  - **What it is**: monitoring your app's performance and scalability.
  - **What companies use: Datadog, Grafana, etc.**

Phew, that's a lot – and this is just for DevOps. Though there are benefits to customizing your stack with purpose-built tools for specific tasks, it's not hard to see that this can become annoying over time: each piece of software requires its own integrations, maintenance, and billing scheme.

> 🔍 **Deeper Look** 🔍
>
> Buying, integrating, and maintaining software – especially in developer tools, and especially at larger companies – can be a surprisingly resource intensive endeavor. Integrating a tool like Datadog requires changes to your application code, e.g. using tracers in Node. While the setup costs are usually up front, they can be non-negligible, hence GitLab's pitch.
>
> 🔍 **Deeper Look** 🔍

GitLab's take is that you should be doing all of this in one, single tool to consolidate your stack. This comical visualization on their homepage puts things into perspective:



Discover a more streamlined way to work

GitLab is a complete DevOps platform, delivered as a single application.

Manage	Plan	Create	Verify	Package	Secure	Release	Configure	Monitor	Protect
Subgroups	Team Planning	Source Code Management	Continuous Integration (CI)	Package Registry	SAST	Continuous Delivery	Auto DevOps	Runbooks	Container Scanning
Audit Events	Portfolio Management	Code Review	Code Testing and Coverage	Container Registry	Secret Detection	Pages	Kubernetes Management	Metrics	Security Orchestration
Audit Reports	Service Desk	Wiki	Performance Testing	Helm Chart Registry	Code Quality	Advanced Deployments	Secrets Management	Incident Management	Container Host Security
Compliance Management	Requirements Management	Static Site Editor	Usability Testing	Dependency Proxy	DAST	Feature Flags	ChatOps	On-call Schedule Management	Container Network Security
DevOps Reports	Quality Management	Web IDE	Accessibility Testing	Git LFS	Fuzz Testing	Release Evidence	Infrastructure as Code	Logging	
Value Stream Management	Design Management	Live Preview	Merge Trains		Dependency Scanning	Release Orchestration	Cluster Cost Management	Tracing	
		Snippets	Review Apps		License Compliance	Environment Management		Error Tracking	
					Vulnerability Management			Product Analytics	

Compare to

PLUTORA	PivotalTracker				SALTSTACK		SALTSTACK		

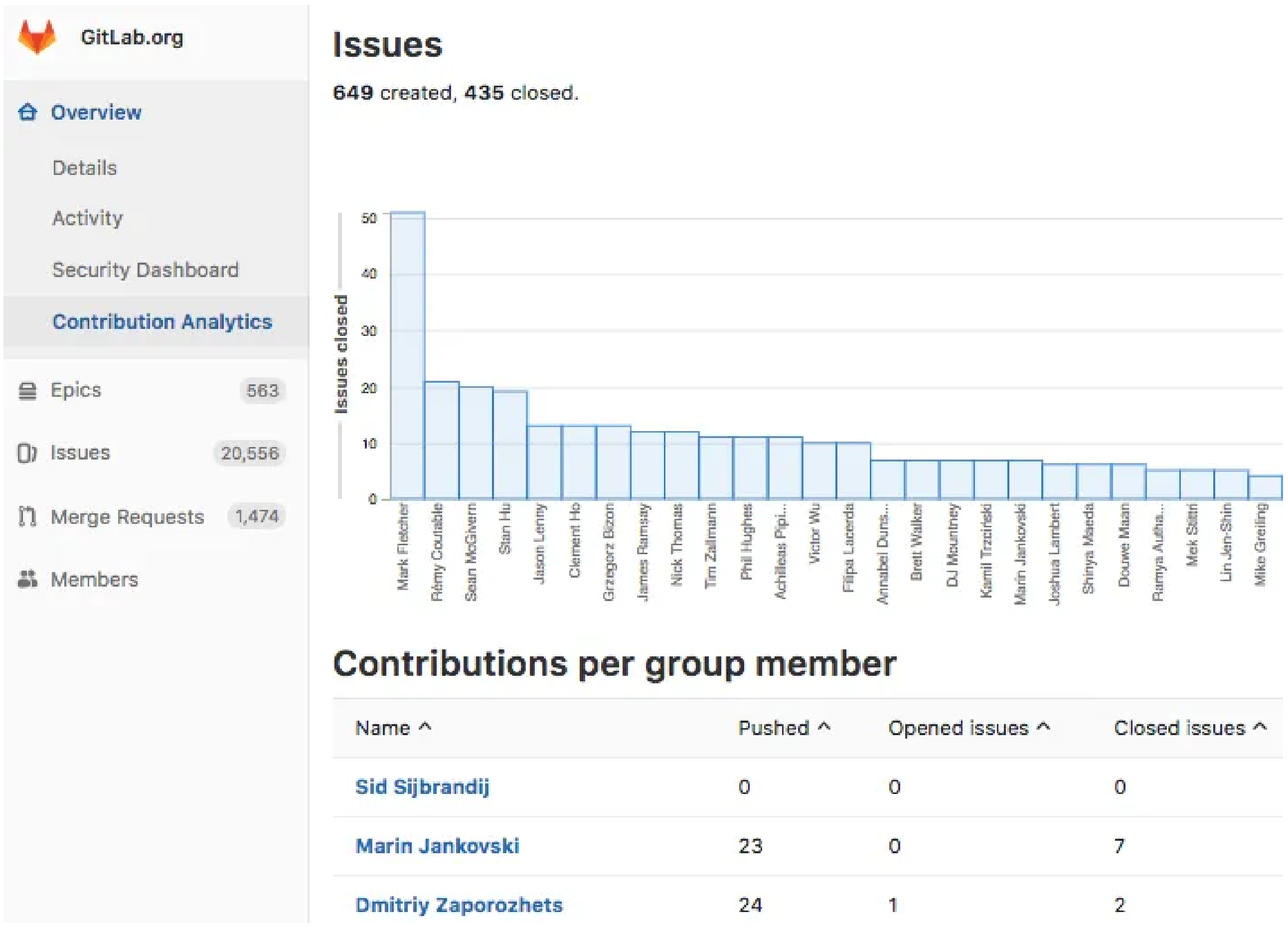
With that in mind, let's dive a bit deeper into what their product offerings look like.

GitLab's product lines

GitLab wants you to use them for everything you'd do that relates to DevOps, from tracking what you're working on all the way to monitoring your application's performance. We'll cover the important ones:

1. **Issue tracking**

You can use GitLab to project manage software engineering, like you'd use Jira. Each feature you want to build, bug you need to fix, or even small cosmetic "let's get to this when we have time" things get what's called an *issue* or a *ticket*. If you've heard the phrase "pick a ticket off the backlog" from an engineer, that's what they're referring to.



Issues

649 created, **435** closed.

Contributions per group member

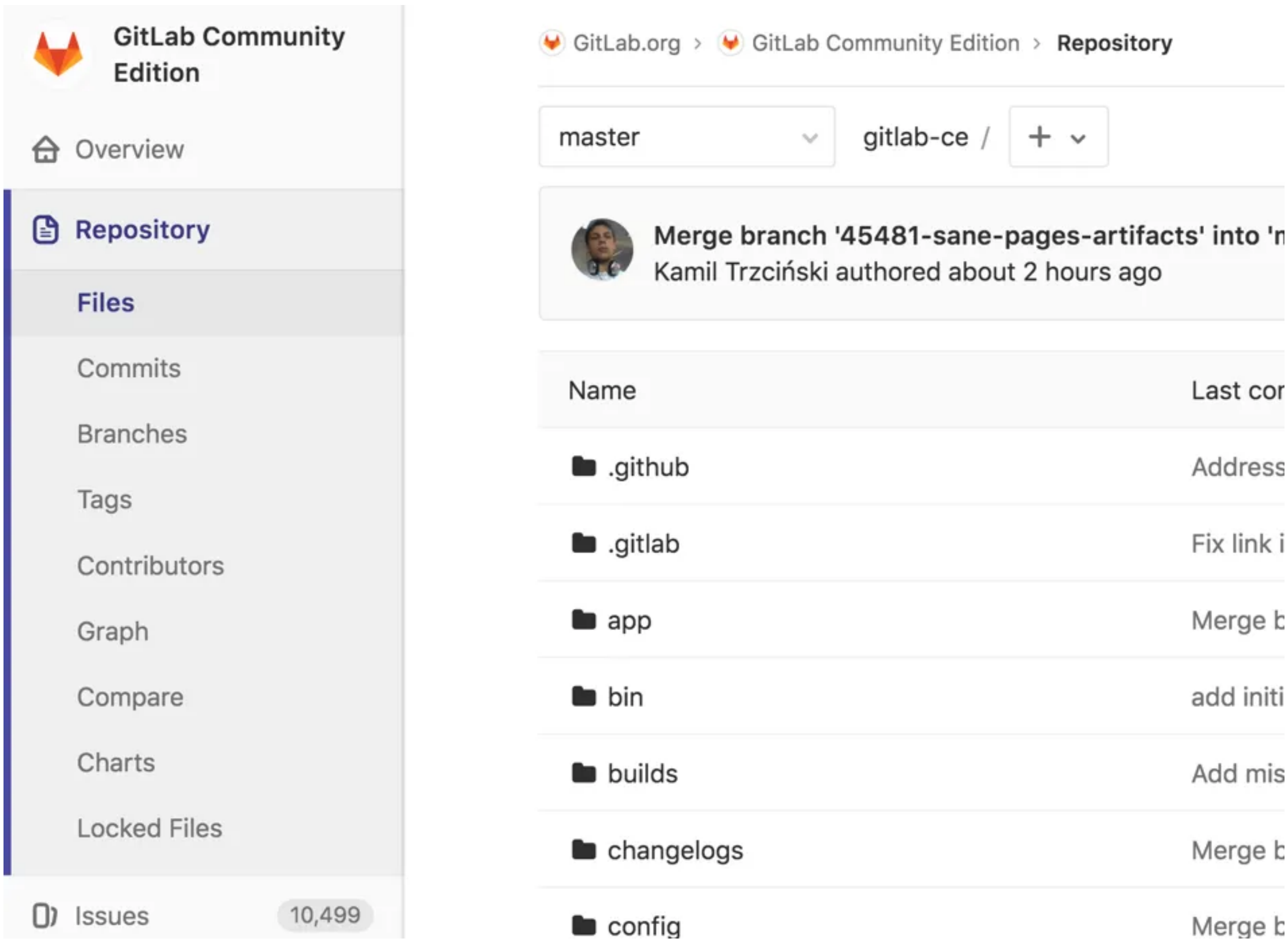
Name	Pushed	Opened issues	Closed issues
Sid Sijbrandij	0	0	0
Marin Jankovski	23	0	7
Dmitriy Zaporozhets	24	1	2

Like other tools, GitLab also gives you analytics on top of your issues: how fast things are getting built, who is contributing the most, and things of that nature.

Alternatives: Jira, Linear, Shortcut

2. **Source / version control**

You can use GitLab to manage your code repositories and handle merging in changes from your team, like you'd use GitHub. The actual application code is hosted on a GitLab server, and developers pull local copies to their laptops to develop new features or fix bugs. Once they're ready to merge that new code in, you use what GitLab calls their Merge Request feature, loosely comparable to a GitHub pull request.



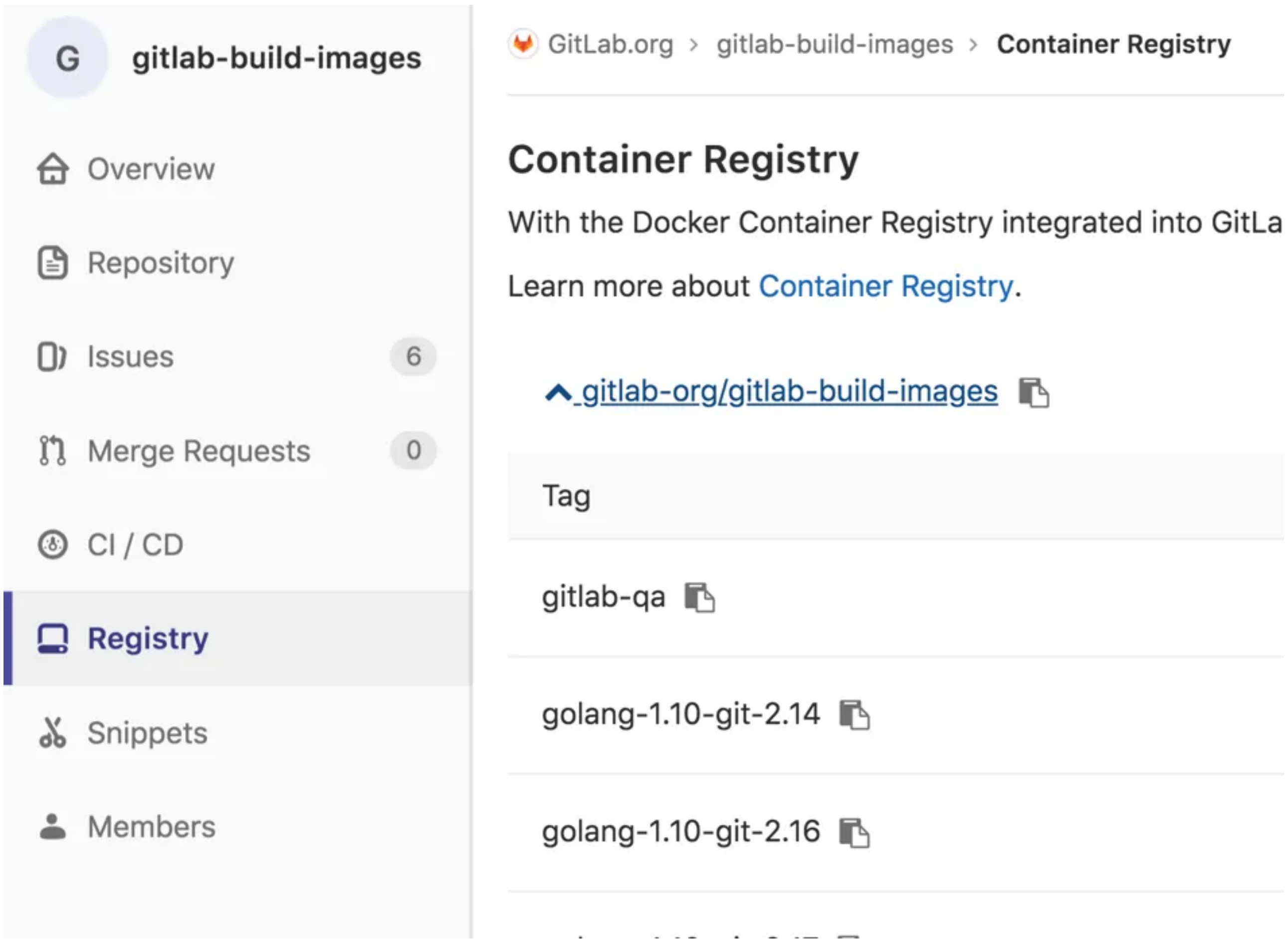
Merge branch '45481-sane-pages-artifacts' into 'n
Kamil Trzciński authored about 2 hours ago

Name	Last cor
.github	Address
.gitlab	Fix link i
app	Merge b
bin	add initi
builds	Add mis
changelogs	Merge b
config	Merge b

Alternatives: GitHub, BitBucket

3. **Package / container registry**

GitLab provides a utility for packaging and storing any **dependencies** that your application relies on. For example, if you've built your web application in React, you need somewhere to store the actual code that Facebook wrote to build React. Most teams use a package manager like npm, but for more mission critical applications with larger packages, teams will use something like GitLab to store and host those packages.



Container Registry

With the Docker Container Registry integrated into GitLa

Learn more about Container Registry.

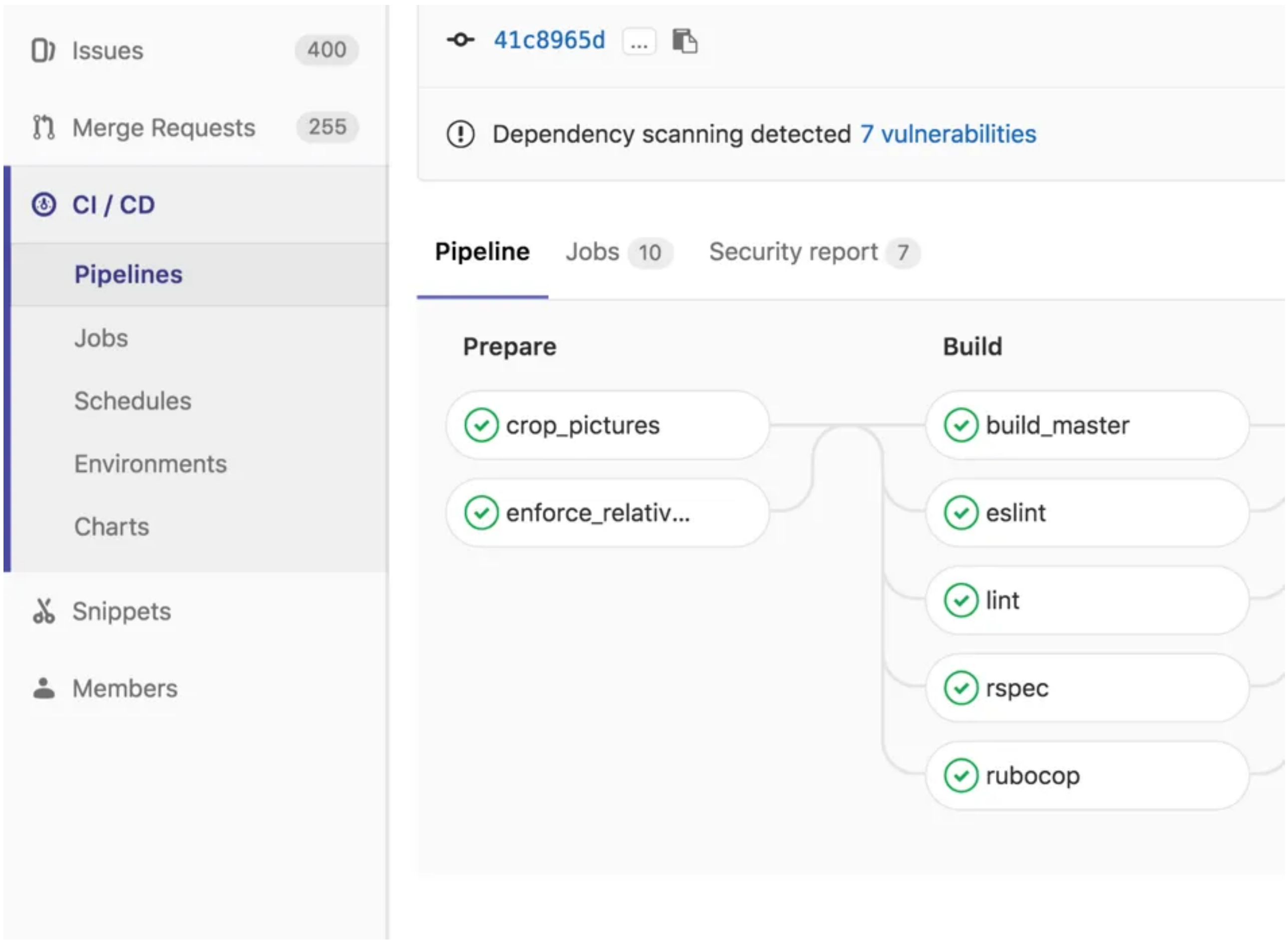
gitlab-org/gitlab-build-images

Tag
gitlab-qa
golang-1.10-git-2.14
golang-1.10-git-2.16

Alternatives: JFrog, npm

4. **CI/CD**

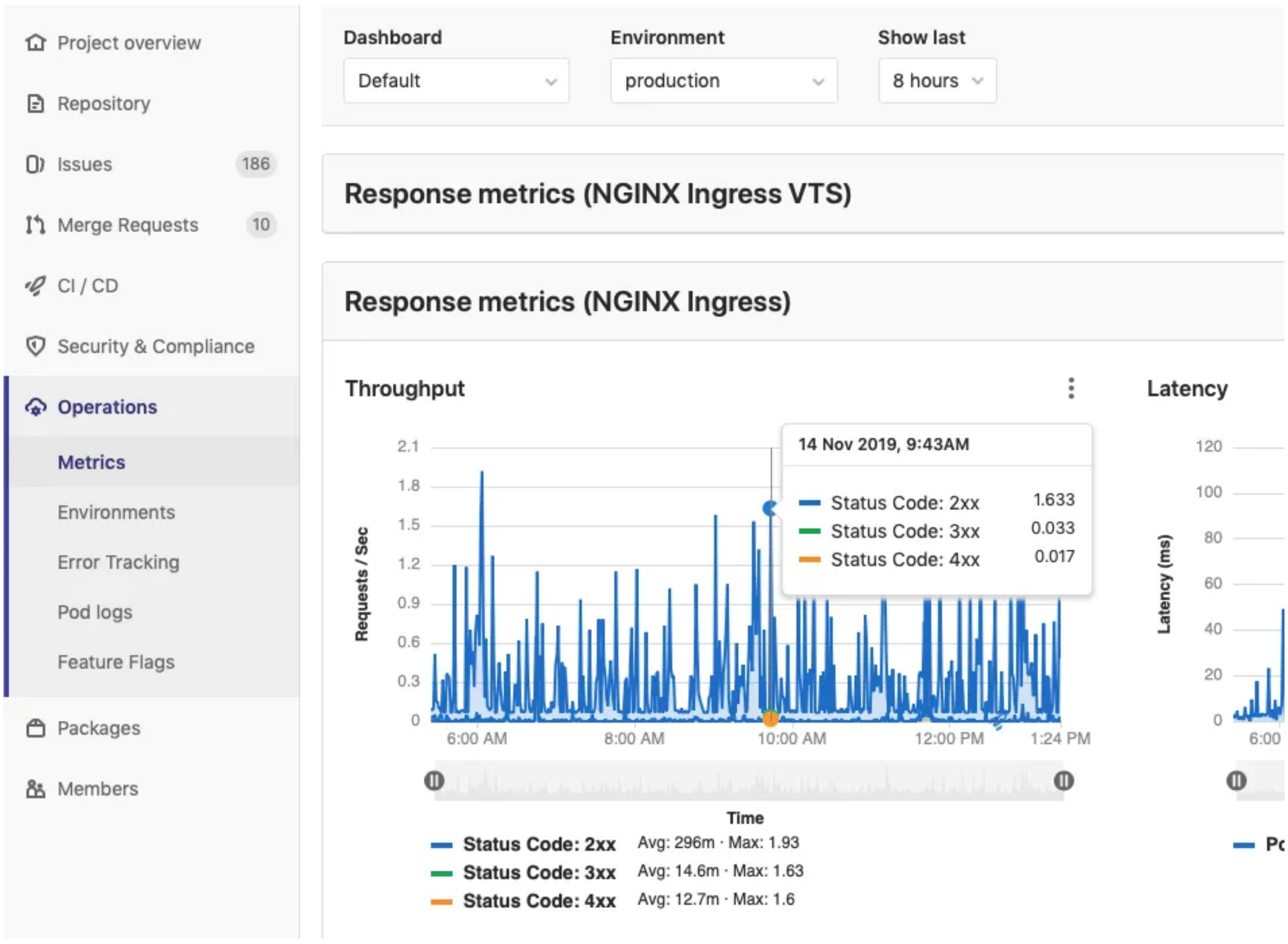
You can use GitLab to run your CI/CD pipelines. For CI, you might use GitLab to run unit tests that make sure your code operates as intended when you create a merge request. For CD, you might use GitLab to run your app's build steps and release it to your users.



Alternatives: CircleCI, Harness, JFrog

5. **Monitoring**

Once you've gotten your application out to your users, you can use GitLab to monitor its performance, like you might use Datadog. Teams commonly look at metrics related to speed, i.e. how quickly APIs respond to requests, as well as reliability, i.e. how often requests return successful responses and if any errors are unusually frequent.



Alternatives: Datadog, Grafana, Elastic

Finally, some closing notes on GitLab. This is an enterprise company who makes their money through large deployments at slow moving, massive companies. And this is why many people have a hard time understanding what they do.

If you've been reading Technically for the past year, you're familiar with the Technically Sniff Test™ – if the company's website **does not** explain what their product does, they're focusing on enterprises. And GitLab is certainly an offender here. The majority of the homepage speaks of faster iteration, business value, transformation, and innovation cycles (?). Documentation is nested two levels deep in their navigation. There are webcasts (?) and e-books advertised above the fold. This is a company selling to executives, not developers.

Comments

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