

CI-as-a-Service Platform Research

This page details and compares available CI-as-a-Service (CISaaS) platforms for open source communities. Though there is no free SaaS provider for Jenkins, it is included in the comparison as that is what most LFN projects are currently using.

Notes on Systems Not Included

There are several other CI SaaS platforms out there not included in this comparison for various reasons.

- **Travis-CI**
After the majority of senior staff was laid off when the company was acquired, Travis-CI was essentially put into standby mode. No new major feature or changes are expected.
- **Bitbucket Pipelines**
Bitbucket Pipelines requires code be hosted in Bitbucket and only provides 50 free minutes per-month for open source projects. This is far too few to even evaluate the system.
- **Appveyor**
Originally the only place to get free Windows builds. There's little need to use them when Azure Pipelines provides all-if-not-more of the same services.

SCM Support by Platform

This table details the support for CI systems to report back the status of builds to SCM providers.

| | Gerrit | Github | GitLab | Bitbucket | Azure Code |
|-----------------|--------|--------|--------|-----------|------------|
| Jenkins | ✓ | ✓ | ✓ | ✓ | ✓ |
| CircleCI | | ✓ | | ✓ | |
| Azure Pipelines | | ✓ | | ✓ | ✓ |
| Drone.io | | ✓ | | | |
| Github Actions | | ✓ | | | |
| GitLab-CI | | ✓ | ✓ | ✓† | |

† https://docs.gitlab.com/ee/ci/ci_cd_for_external_repos/bitbucket_integration.html

Note: a similar approach could be used for other SCMs provided there is an API for updating CI status

Build Resources and Minutes

Builds, agents, runners: these are all different names providers use to refer to the compute machine CI/CD builds run on.

| | Builder Size | Max Job Time | ARM Builders | External Builders | Platform Support |
|-----------------|-----------------------------------|--------------|--------------|-------------------|------------------|
| Jenkins | N/A | N/A | N/A | Yes | All |
| CircleCI | 2 vCPUs, 4-8 Gb RAM, larger sizes | 5 Hours | | Yes/No | All |
| Azure Pipelines | 2 vCPUs, 7 Gb RAM | 6 Hours | | Yes | All |
| Drone.io | N/A | 1 Hour | Yes | Yes/No | Linux |
| Github Actions | 2 vCPUs, 7 Gb RAM | 6 Hours | | Yes | All |
| GitLab-CI | 1 vCPU, 3.75 Gb RAM | 3 Hours | | Yes | Linux, Windows |

Platform Support 'All' means support for Linux, OSX, Windows.

External Builders 'Yes/No' means external hardware is supported in the self-hosted (non SaaS) version.

Plans and Pricing Models

Details on 'free for open source' plans and pricing models for communities who may exceed those limits.

| | Minutes (per Month) | Concurrent Builds (per Organization) | Pricing Model |
|--|---------------------|--------------------------------------|---------------|
|--|---------------------|--------------------------------------|---------------|

| | | | |
|-----------------|-----------|-----------|---------------------------------------|
| Jenkins | N/A | N/A | N/A |
| CircleCI | 1000 | 4 | Containers + Features |
| Azure Pipelines | Unlimited | 10 | Concurrency |
| Drone.io | N/A | N/A | None |
| Github Actions | Unlimited | 20 | Users |
| Gitlab-CI | 50,000* | Unlimited | Users |

Gitlab-CI: Open source projects need to apply to the "Gold" level to bump the minute cap.

Platform Feature Comparison

This is not an exhaustive list of features across all the projects but a subset that maybe relevant to LFN projects.

| | Container Registry | Package Hosting | Local Builds | Bring Your Own Builder | Test Result Reports | Dependency Caching | Matrix Builds | Cross Project Pipelines | SSH Debug Support |
|----------------|--------------------|-----------------|--------------|------------------------|---------------------|--------------------|---------------|-------------------------|-------------------|
| Jenkins | | | | ✓ | ✓ | | ✓ | ✓ | |
| CircleCI | | | ✓ | | | ✓ | ✓ | | ✓ |
| Azure Pipeline | ⓘ | ✓ | | ✓ | ✓ | ✓ | ✓ | ⓘ | |
| Drone.io | | | ✓ | | | ✓ | ✓ | | |
| Github Actions | ✓ | ✓ | | ✓ | | ✓ | ✓ | ⓘ | |
| Gitlab-CI | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ⓘ | ✓ | ⓘ |



Azure Pipelines: Container Register is not free; Cross Project Pipelines provide no indication in the UI
Github Actions: Cross Project Pipelines provide no indication in the UI
Gitlab-CI: Matrix builds are created with dynamic [child pipelines](#); SSH Debug Support only on Kubernetes clusters.

Feature Descriptions

Container Registry

Registry hosted by the provider to store container build images

Package Hosting

Support for top package formats (Ex: Maven, NPM, Helm)

Bring-Your-Own-Build

External machines (VMs, hardware, containers) can be connected to the platform

Test Result Reporting

Insights and statistics for test results

Local Builds

Reduced CI development time by supporting verifying CI configuration and builds locally

Dependency Caching

Support for caching packages or files between builds (Ex: Maven, PyPI, NPM)

Matrix Builds

Reduces job configuration needed to build the combination of multiple versions across multiple platforms

Cross Project Pipelines

Dependent builds can be easily traced across projects (not just within a project)

SSH Debugging

Pausing the execution of a build to login and debug build failures