Heroku CI

Last updated 06 August 2019

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Heroku CI automatically runs your app's test suite with every push to your app's GitHub repository, enabling you to easily review test results before merging or deploying changes to your codebase. Tests execute in a disposable environment that closely resembles your staging and production environments, which helps to ensure that results are accurate and obtained safely.

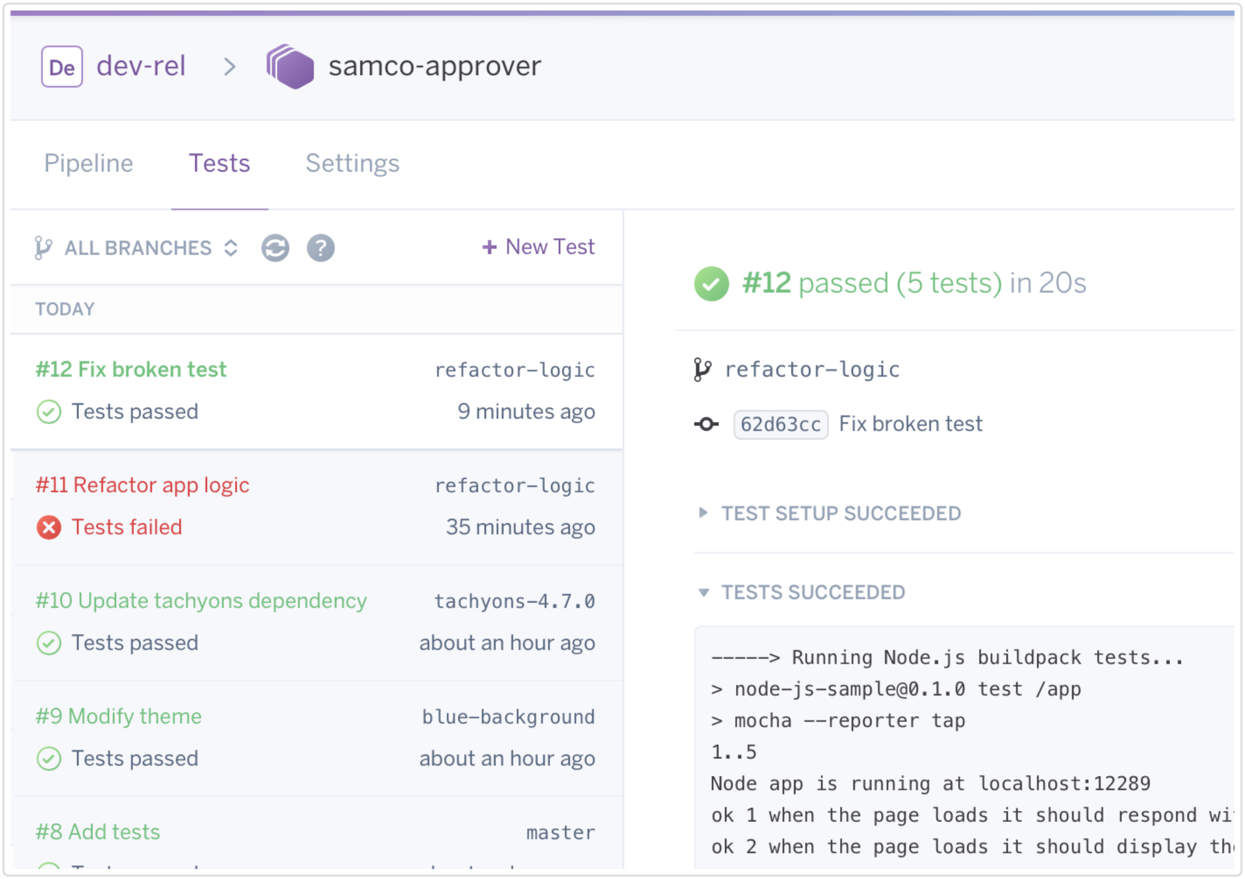
Heroku CI works seamlessly with any Heroku Pipeline (https://devcenter.heroku.com/articles/pipelines).

Setup

1. If you don't have one already, create a Heroku Pipeline (https://devcenter.heroku.com/articles/pipelines#creating-pipelines) for your app.

2. Select a single verified Heroku user or team (https://devcenter.heroku.com/articles/heroku-teams) that will own the pipeline and all of its associated apps. Assign ownership to this user or team via the Heroku Dashboard (https://dashboard.heroku.com). Heroku CI usage is billed to the account that owns the associated pipeline.
3. Go to your pipeline's Settings tab in the Heroku Dashboard and connect your app's GitHub repository. Note that you must have admin access to the repo.
4. Also from your pipeline's Settings tab, click **Enable Heroku CI**.

If your app uses a common testing framework for its associated language, Heroku CI is probably already configured to execute the correct command for your test suite. Try creating a pull request on your GitHub repo. If Heroku CI is configured correctly, you should see your test suite running from your pipeline's Tests tab in the Heroku Dashboard:



#12 Fix broken test	refactor-logic
Tests passed	9 minutes ago
#11 Refactor app logic	refactor-logic
Tests failed	35 minutes ago
#10 Update tachyons dependency	tachyons-4.7.0
Tests passed	about an hour ago
#9 Modify theme	blue-background
Tests passed	about an hour ago
#8 Add tests	master

#12 passed (5 tests) in 20s

refactor-logic

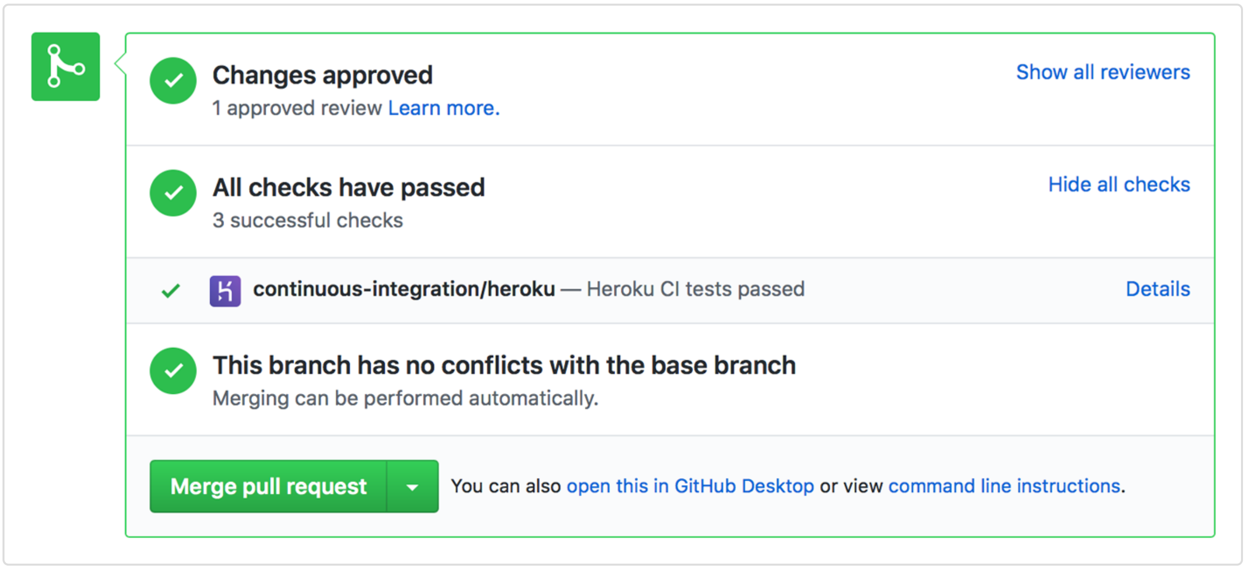
62d63cc Fix broken test

TEST SETUP SUCCEEDED

TESTS SUCCEEDED

```
-----> Running Node.js buildpack tests...
> node-js-sample@0.1.0 test /app
> mocha --reporter tap
1..5
Node app is running at localhost:12289
ok 1 when the page loads it should respond wi
ok 2 when the page loads it should display th
```

The GitHub pull request's Conversation tab also displays CI results next to a Heroku icon:


Changes approved
1 approved review Learn more.
Show all reviewers

All checks have passed
3 successful checks
Hide all checks

continuous-integration/heroku — Heroku CI tests passed
Details

This branch has no conflicts with the base branch
Merging can be performed automatically.

You can also open this in GitHub Desktop or view command line instructions.

If Heroku CI doesn't execute the correct command, or if some tests fail due to missing resources in your test environment, you can easily resolve these issues by configuring your test environment.

Configuring your test environment

You can configure your Heroku CI test environment by including an `app.json` manifest in your repository's root directory. During CI test runs, any keys defined in this file's `test` environment (https://devcenter.heroku.com/articles/app-json-schema#environments) take precedence over any matching keys in your app's base configuration.

Keys that affect the configuration of your CI environment include:

- `scripts`
- `add-ons`
- `env`
- `buildpacks`
- `formation`

Specifying custom test commands (the scripts key)

The `scripts` section of your `app.json` manifest lets you override the commands that Heroku CI runs to set up and then run your test suite. For typical usage of Heroku's officially supported languages, you do *not* need to specify these (see additional language-specific documentation below).

The `scripts` field can include two keys: `test-setup` and `test`. Each of these can be any shell command, including the path to an executable that exists within your application repo (e.g., `make tests`).

test-setup

Include a `test-setup` script to perform one-time setup tasks before running your test suite, for example:

- Installing test dependencies like code linters, compilers, and test runners

- Setting up and seeding a database

test

The `test` script should be the command you use to execute your tests. It’s likely the same command you use in your local environment, such as `bundle exec rspec` or `npm test`.

Example

If your Ruby app doesn’t have any tests, but you want to analyze all new code changes with Rubocop, you can install and run it as your test suite like so:

```
{
  "environments": {
    "test": {
      "scripts": {
        "test-setup": "gem install rubocop",
        "test": "rubocop ."
      }
    }
  }
}
```

Provisioning add-ons (the addons key)

Heroku uses your project’s `app.json` manifest to determine which add-on services to provision for temporary deployments (i.e., deployments performed by Heroku CI and review apps).

Many add-ons that support Heroku CI have a special plan that is provisioned for test runs. These plans are functionally similar to a production add-on plan but are quicker to provision and de-provision.

For example, Heroku Postgres and Heroku Redis both have an ephemeral `in-dyno` plan that can only be provisioned during a test run. You can learn more about them in Heroku CI In-Dyno Databases (https://devcenter.heroku.com/articles/heroku-ci-in-dyno-databases).

Some add-ons don’t support Heroku CI. If you attempt to provision one of these add-ons during a test run, you’ll encounter an error message like `<add-on service slug> has opted out of supporting Review and CI apps`.

Example

This snippet specifies that Heroku CI should provision an instance of the `in-dyno` Heroku Redis plan for test runs:

```
{
  "environments": {
    "test": {
      "addons":[
        "heroku-redis:in-dyno"
      ]
    }
  }
}
```

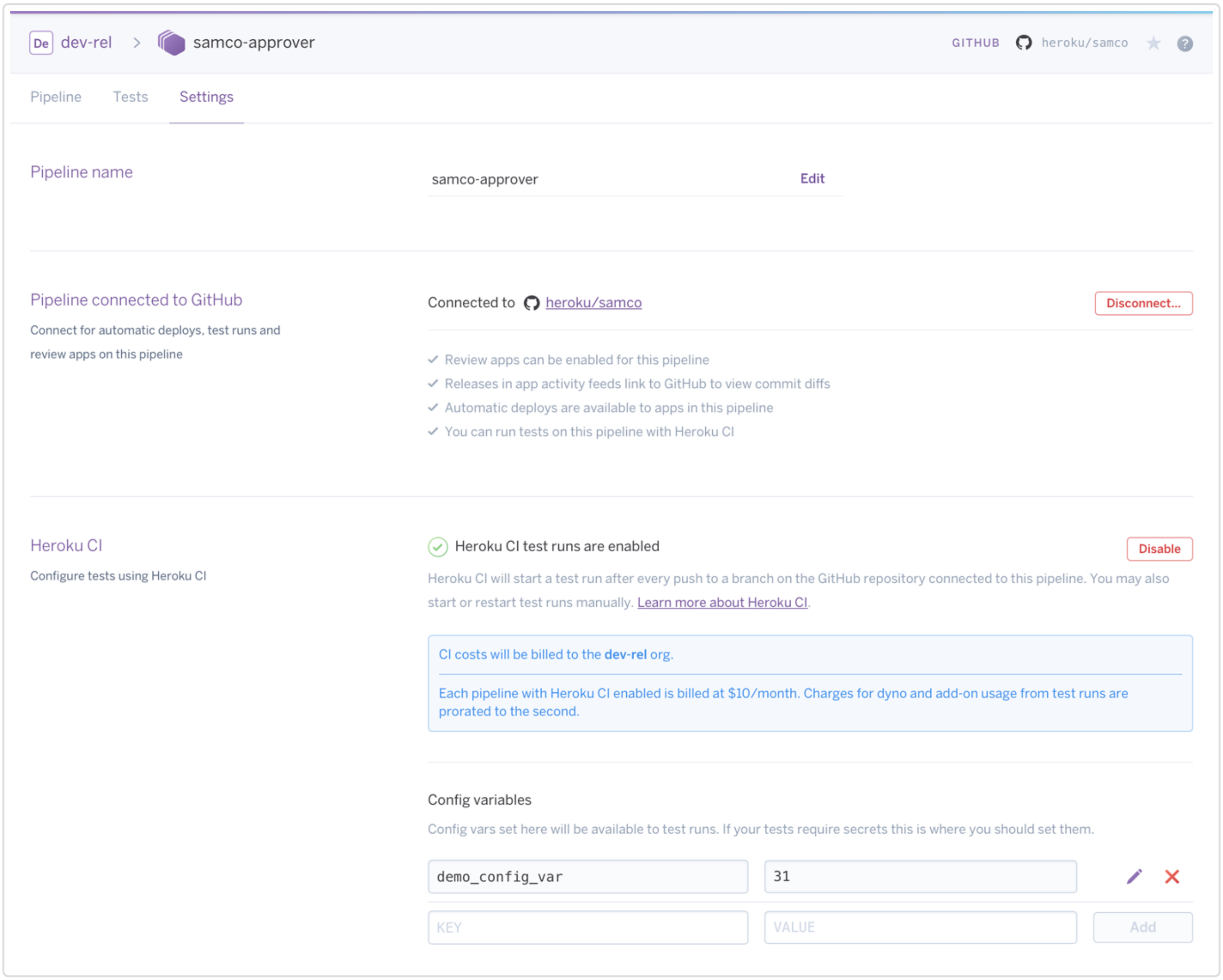
Setting environment variables (the env key)

If your app or any of its add-ons require certain environment variables during test runs, you can specify them with the `env` key, like so:

```
{
  "environments": {
    "test": {
      "env": {
        "PHOTON_TORPEDOES": "online"
      }
    }
  }
}
```

Note that unlike review apps (https://devcenter.heroku.com/articles/github-integration-review-apps), Heroku CI does *not* inherit any config vars from the parent app.

To set confidential or volatile environment variables (such as access tokens) that you shouldn't include in `app.json`, you can instead add them to your pipeline's Heroku CI settings in the Heroku Dashboard:



Pipeline name: samco-approver

Pipeline connected to GitHub
Connect for automatic deploys, test runs and review apps on this pipeline

Connected to heroku/samco

✓ Review apps can be enabled for this pipeline
✓ Releases in app activity feeds link to GitHub to view commit diffs
✓ Automatic deploys are available to apps in this pipeline
✓ You can run tests on this pipeline with Heroku CI

Heroku CI
Configure tests using Heroku CI

Heroku CI test runs are enabled

Heroku CI will start a test run after every push to a branch on the GitHub repository connected to this pipeline. You may also start or restart test runs manually. Learn more about Heroku CI.

CI costs will be billed to the **dev-rel** org.

Each pipeline with Heroku CI enabled is billed at $10/month. Charges for dyno and add-on usage from test runs are prorated to the second.

Config variables
Config vars set here will be available to test runs. If your tests require secrets this is where you should set them.

KEY	VALUE
demo_config_var	31

Values specified here are available in all test runs.

Immutable environment variables

The following environment variables are available in all Heroku CI test runs and cannot be changed:

- `CI` : A string indicating that this is a continuous integration environment. This value is always `true` .
- `HEROKU_TEST_RUN_BRANCH` : A string representing the branch of the commit being tested.
- `HEROKU_TEST_RUN_COMMIT_VERSION` : A string representing the commit version being tested (this is usually the commit's SHA).
- `HEROKU_TEST_RUN_ID` : A string UUID representing the unique ID of the test run.

Test run behavior

After you enable Heroku CI for a pipeline, it runs tests automatically for every subsequent push to your GitHub repository. This means that all GitHub pull requests are automatically tested, along with any merges to master (which are typically deployed to staging).

Test runs are executed inside an ephemeral Heroku app that is provisioned for each test run. The app is automatically destroyed when the run completes.

CI does *not* run on Pipeline promotions (https://devcenter.heroku.com/articles/pipelines#promoting), or on direct deploys to an app in your pipeline. Any arbitrary branch can be tested via a manual test run, available from your pipeline's Tests tab.

All Heroku CI test runs execute on the Common Runtime (even if the parent app runs in a **Private Space (https://devcenter.heroku.com/articles/private-spaces)**). Consequently, test runs cannot access apps or resources running inside a Private Space.

Using with automatic deploys

Heroku's GitHub integration (https://devcenter.heroku.com/articles/github-integration) lets you automatically deploy a new version of your app (usually to development or staging) whenever a designated branch of your repo is updated.

You can require that your Heroku CI test run pass before an update to this branch is automatically deployed. See Automatic Deploys (https://devcenter.heroku.com/articles/github-integration#automatic-deploys) to learn how.

Supported languages

Heroku CI offers language support via the Testpack API (https://devcenter.heroku.com/articles/testpack-api), which allows a buildpack to prepare your app for testing, and in some cases, detect what tests to run.

All of Heroku's officially supported languages have full Heroku CI support. Some third-party buildpacks also provide support.

To add Heroku CI support to a buildpack, the buildpack needs to implement the Testpack API (https://devcenter.heroku.com/articles/testpack-api). As an example, check out this pull request to the Elixir buildpack (https://github.com/HashNuke/heroku-buildpack-elixir/pull/92). For additional help or assistance, reach out to us at **heroku-ci-feedback@heroku.com**.

Go

The Heroku Go buildpack (https://github.com/heroku/heroku-buildpack-go) supports Heroku CI:

- Compiles and installs dependencies with detected tool (e.g. `govendor` , `godep`);
- Runs tests with `go test ./…` .

Node

The Heroku Node buildpack (https://github.com/heroku/heroku-buildpack-nodejs) supports Heroku CI:

- Compiles your tests with `NPM_CONFIG_PRODUCTION=false` and `NODE_ENV=test` (which installs your test and dev dependencies)
- Runs your tests with `npm test` or `yarn test` as appropriate

For typical Node apps, this should mean you do not need to define test scripts in `app.json` (but you may in `package.json`).

Java

The Heroku Java buildpack (https://github.com/heroku/heroku-buildpack-java) supports Heroku CI.

- Compiles test source code into the `target` directory by executing Maven's `test-compile` lifecycle.
- Executes tests by running `mvn -B test` or `mvnw -B test` depending if using your own Maven wrapper.

PHP

The Heroku PHP buildpack (https://github.com/heroku/heroku-buildpack-php) supports Heroku CI:

- Dependencies from `require-dev` in `composer.json` will be installed for test runs.
- Tests are auto-detected in the following order; only the first match found is executed:
    1. `composer test` (runs `test` from the `scripts` section in `composer.json`)
    2. `codecept run`
    3. `behat`
    4. `phpspec run`
    5. `atoum`
    6. `kahlan`
    7. `peridot`
    8. `phpunit`
- the `zend.assertions` INI directive (https://www.php.net/manual/en/ini.core.php#ini.zend.assertions) is enabled on Heroku CI for PHP 7 applications

Make sure your test dependencies, e.g. **`phpunit/phpunit` (https://phpunit.de)**, are in your `composer.json` `require-dev` section, and that `composer.lock` is up to date.

If your tests require a running web server, e.g. for acceptance testing, you need to launch the boot script you're also using in your `Procfile` in the background, and suppress all of its output. This can also be done in the `test-setup` step:

```
{
  "environments": {
    "test": {
      "scripts": {
        "test-setup": "heroku-php-apache2 >/dev/null 2>&1 & sleep 5",
        "test": "codecept run"
      }
    }
  }
}
```

The `sleep 5` call ensures that the PHP-FPM and the web server have started up fully before the tests are started.

Python

The Heroku Python buildpack (https://github.com/heroku/heroku-buildpack-python) supports Heroku CI:

- All dependencies specified within `requirements.txt` and optionally `requirements-test.txt` will be installed

The Python buildpack does not automatically detect your tests. You'll need to tell Heroku CI what tests to run with `scripts.test` in your `app.json`.

Example `app.json`:

```
{
  "environments": {
    "test": {
      "scripts": {
        "test": "nose test"
      }
    }
  }
}
```

Ruby

The Heroku Ruby buildpack (https://github.com/heroku/heroku-buildpack-ruby) supports Heroku CI:

- installs `development` and `test` dependencies defined in your `Gemfile`

- supports both `:ruby` or `:sql` database schema when preparing database tests. In addition, will run `rake db:migrate`.
- Runs your tests with the appropriate Rake command (e.g. `bundle exec rspec`, `bin/rails test`, or `rake test`).

For typical Ruby apps, you should not need to define scripts in app.json.

The Ruby Buildpack creates a `lib/tasks/heroku_clear_tasks.rake` file in your application for a Rails CI test run. The Heroku Postgres add-on does not provide create, drop, or reset access. This file works around the lack of access since they aren't needed to run your test suite.

Heroku CI does not currently support `capybara-webkit` please see for supports **browser and user Acceptance Testing (beta) (https://devcenter.heroku.com/articles/heroku-ci-browser-and-user-acceptance-testing-uat)**

Example (for a Rails app):

```
{
  "environments": {
    "test": {
      "addons":[
         "heroku-redis",
         "heroku-postgresql"
      ]
    }
  }
}
```

Gradle

The Heroku Gradle buildpack (https://github.com/heroku/heroku-buildpack-gradle) supports Heroku CI.

- Runs tests with `gradlew test`.

Scala

The Heroku Scala buildpack (https://github.com/heroku/heroku-buildpack-scala) supports Heroku CI.

- Runs tests with `sbt test`.

Clojure

The Heroku Clojure buildpack (https://github.com/heroku/heroku-buildpack-clojure) supports Heroku CI.

- Prepares test environment by running `lein deps` (which will be overrided by the `LEIN_BUILD_TASK` config var).

- Runs tests with `lein test`.

Elixir

The third-party Elixir buildpack (https://github.com/HashNuke/heroku-buildpack-elixir) supports Heroku CI:

- Compiles and installs dependencies with `MIX_ENV=test`.
- Runs tests with `mix test`.

Note that because Elixir is not an officially supported language, you must still specify the buildpack in your `app.json` file. Also make sure that the `test` alias in your `mix.exs` file does not create a database, because adding the Heroku Postgres add-on does that for you.

Example `app.json`:

```
{
  "buildpacks": [
    {"url": "https://github.com/HashNuke/heroku-buildpack-elixir"}
  ]
}
```

Release Phase and Heroku CI

Release Phase (https://devcenter.heroku.com/articles/release-phase) is ignored during Heroku CI test runs. We suggest placing any scripts that need to run before your tests in your `test-setup` script.

Parallel Test Runs for Heroku CI

Parallel Test Runs for Heroku CI (https://devcenter.heroku.com/articles/heroku-ci-parallel-test-runs) enable you to distribute your app's test suite across multiple dynos to substantially reduce execution time.

Browser tests and UAT on Heroku CI

The (headless) Chrome buildpack enables tests that require Chrome (e.g., Selenium and other UAT technologies). Other solutions are also supported.

See documentation for Heroku CI user acceptance testing (https://devcenter.heroku.com/articles/heroku-ci-browser-and-user-acceptance-testing-uat) (UAT) for more detail.

Debugging

The Heroku CLI (https://devcenter.heroku.com/articles/heroku-cli) includes a `ci:debug` command that you can use to start a debug test run. This enables you to inspect the Heroku CI environment and the execution of tests inside a test dyno. This is handy for solving issues where tests pass locally but not on CI, or for debugging problems with test setup.

You should run this command from within your repo. It will build a new test run and execute the test setup phase. Note that the `heroku ci:debug` command doesn't require you to push your latest commits to GitHub. It creates a new test dyno based on your latest local commit.

```
$ cd my-repository
$ heroku ci:debug
Preparing source... done
Creating test run... done
Running setup and attaching to test dyno...

~ $ npm test # or whatever test command your application uses
```

To skip the test setup phase (for debugging setup issues), run with the `--no-setup` flag:

```
$ heroku ci:debug --no-setup
Preparing source... done
Creating test run... done
Attaching to test dyno...
 ▸    Skipping test setup phase.
 ▸    Run `sprettur setup && for f in .profile.d/*; do source $f; done`
 ▸    to execute a build and configure the environment
~ $
```

Technical detail on test run lifecycle

Maintainers of third-party buildpacks can add explicit support for Heroku CI to their buildpacks. Please contact Heroku for help adding this support to your buildpack.

Consult Heroku CI: Technical Detail on Test Run Lifecycle (https://devcenter.heroku.com/articles/heroku-ci-technical-detail-on-ci-lifecycle) for the sequence of events performed by Heroku CI during a test run. This information can be also be helpful to advanced developers who want to debug certain test run failures.

Costs

Each CI-enabled pipeline is $10/month (prorated to the second).

Additionally, dyno and add-on run time for the duration of the test run is charged (prorated to the second).

This pricing enables you to try out Heroku CI with your pipeline for a very low cost.

Cost details are available on the Heroku pricing page (https://www.heroku.com/pricing).

Dynos

By default, test runs execute on a Performance-M dyno and are billed at that rate prorated to the second. Note that this run time includes both `test-setup` and `test` phases. For example, a 5-minute test run incurs $0.03 in dyno costs:

```
$250/month * 5 minutes / 43200 minutes/month = $0.03
```

Alternative dyno sizes can be specified with the `formation` key in the `test` environment section of your `app.json` file. Dyno sizes (https://devcenter.heroku.com/articles/dyno-types) of `standard-1x` and above are supported. e.g.:

```
"environments": {
    "test": {
      "formation": {
          "test": {
            "quantity": 1,
            "size": "performance-l"
          }
      }
   }
}
```

Add-ons

When a test run is created, any add-ons listed in the `app.json` manifest's `test` environment are provisioned with the "temporary deployments" plan specified by the add-on vendor. If the `test` environment is either absent or omits the `addons` key, the list of add-ons in the base manifest is used.

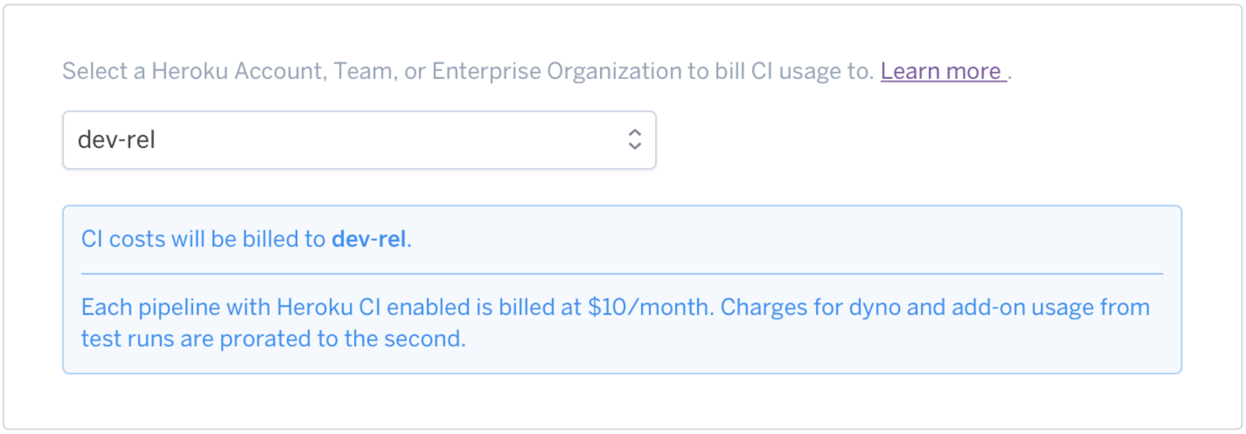
Note that add-on providers are informed that these add-ons are being used to support ephemeral CI runs, and they might take measures (https://devcenter.heroku.com/changelog-items/1113) to allow the add-on to provision and destroy faster, such as omitting long-term logging or regular backups.

After a test run completes (reported as `failed`, `errored`, or `succeeded`), the test run's add-ons are de-provisioned and destroyed. This means that any paid add-ons are billed at the plan's rate, prorated to the second, only for the duration of the test run. Free add-on plans remain free on Heroku CI.

Billing

On your pipeline's Settings page in your Pipelines interface, under "Configure Heroku CI" you can select which party will be billed for CI runs.

If your Pipeline is comprised only of resources owned by a Heroku Teams or Heroku Enterprise Organization (as we recommend), you will have only the option to bill that Team or Organization. If you have Personal apps in your Pipeline (which we do not recommend), you will be offered the option to bill CI runs to your personal account.



Select a Heroku Account, Team, or Enterprise Organization to bill CI usage to. Learn more .

dev-rel

CI costs will be billed to **dev-rel**.

Each pipeline with Heroku CI enabled is billed at $10/month. Charges for dyno and add-on usage from test runs are prorated to the second.

Known issues

Rails fixtures and referential integrity

Rails default fixtures load test data by first disabling referential integrity. If you are using this feature you cannot use the default Heroku Postgres add-on. Instead, you can use in dyno databases (https://devcenter.heroku.com/articles/heroku-ci-in-dyno-databases).

Xvfb Google Chrome Buildpack and heroku stacks

The Xvfb Google Chrome Buildpack (https://github.com/heroku/heroku-buildpack-xvfb-google-chrome) is incompatible with the `heroku-16` and `heroku-18` stacks. We suggest using the Google Chrome Buildpack (https://github.com/heroku/heroku-buildpack-google-chrome) (headless, without Xvfb) instead.

Buildpack shorthand names

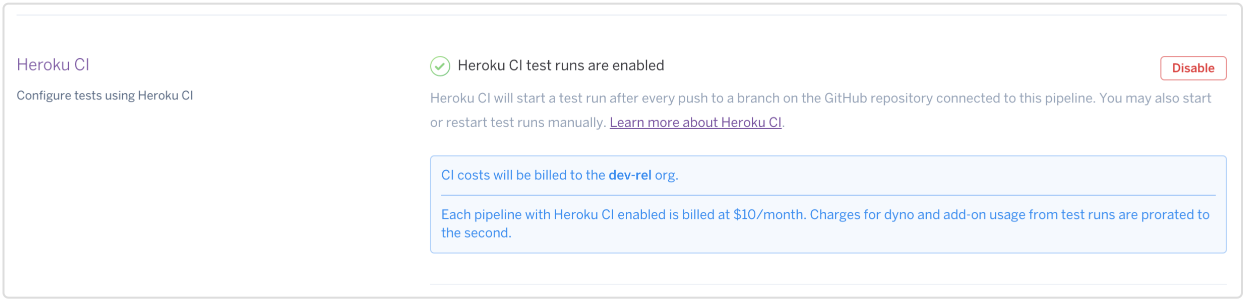
Shorthand names for buildpacks is not currently supported. For example, `heroku/jvm` will not be automatically resolved to the fully qualified name of the buildpack `https://github.com/heroku/heroku-buildpack-java` . While we work on resolving this, please use the fully qualified name which can be found from the Elements page of each buildpack (https://devcenter.heroku.com/articles/buildpacks#officially-supported-buildpacks).

Docker deploys

Currently, it is not possible to use Heroku CI to test container builds.

Disabling Heroku CI

To disable Heroku CI on a given pipeline, visit the pipeline's Settings tab on the Heroku Dashboard and click **Disable**.


Heroku CI

Configure tests using Heroku CI

Heroku CI test runs are enabled

Heroku CI will start a test run after every push to a branch on the GitHub repository connected to this pipeline. You may also start or restart test runs manually. Learn more about Heroku CI.

CI costs will be billed to the **dev-rel** org.

Each pipeline with Heroku CI enabled is billed at $10/month. Charges for dyno and add-on usage from test runs are prorated to the second.

Charges for CI-enablement and CI runs on the Pipeline will stop immediately. Note that CI is billed per second.