



illionx

Global Knowledge.®

Module – Introduction to CI/CD

WORLDWIDE LOCATIONS

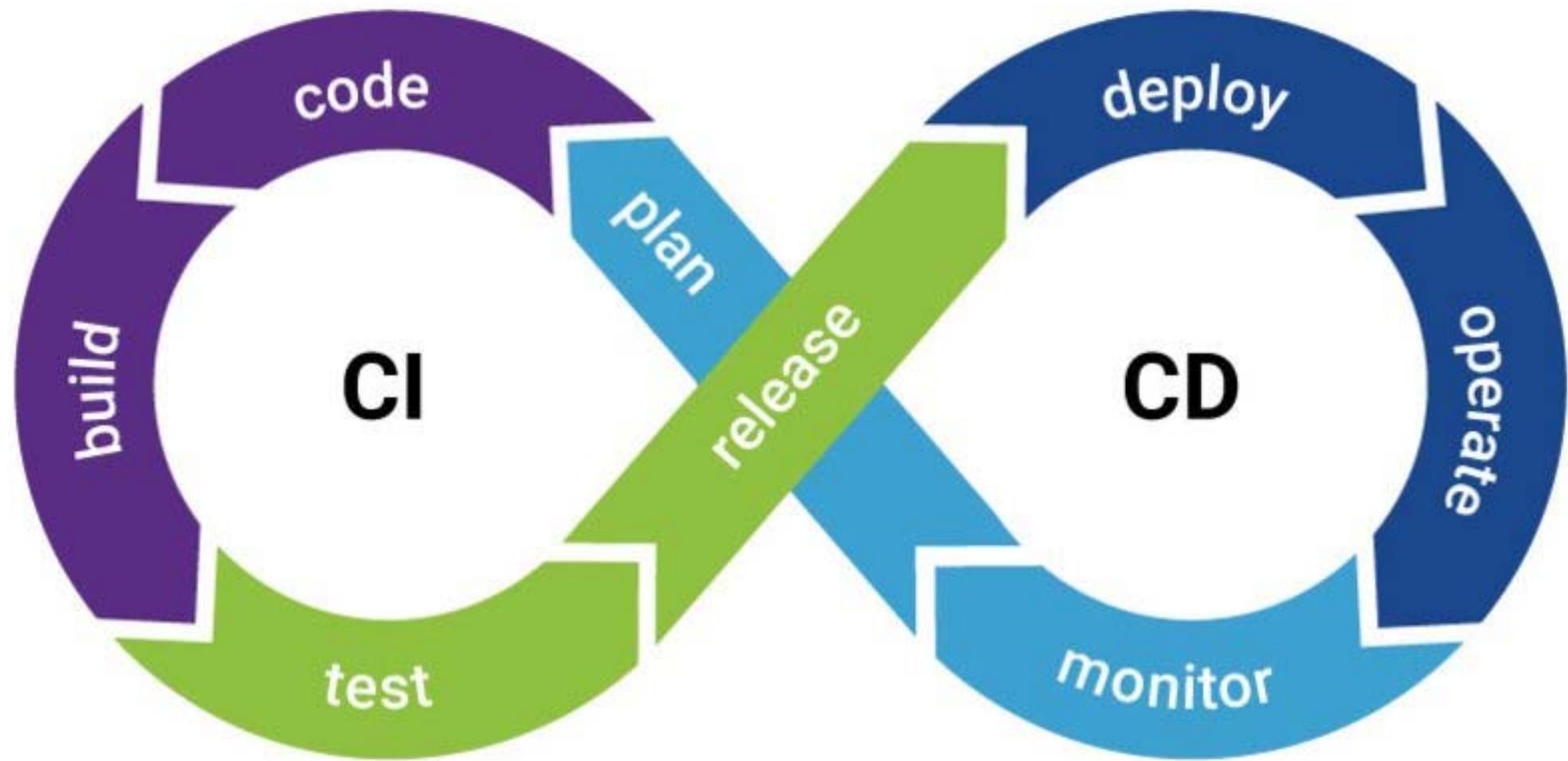
BELGIUM CANADA COLOMBIA DENMARK EGYPT FRANCE IRELAND JAPAN KOREA MALAYSIA MEXICO NETHERLANDS NORWAY QATAR
SAUDI ARABIA SINGAPORE SPAIN SWEDEN UNITED ARAB EMIRATES UNITED KINGDOM UNITED STATES OF AMERICA

What is CI/CD?

Acronym: *Continuous Integration* & *Continuous Delivery*
(or *Continuous Deployment*)

"CI/CD is a method to frequently deliver apps to customers by introducing automation into the stages of app development"

CI/CD Visualisation



Phases

- Ongoing automation and continuous monitoring
- Respond to the lifecycle (events) in apps
- Phases
 - Designing & Coding
 - Testing & merging into branch
 - Release
 - Deploy to production
 - Monitoring
 - Planning new features, solving bugs, etc.



Continuous integration

- In bigger apps: multiple developers working **simultaneously** on **different features** of the **same app**
- Chances of **conflicts** if there is one big 'merge day'
- CI: merge changes back to a **shared branch** or **trunk**
- Changes are **validated and tested automatically** during the process
- **Conflicts?** Easier to solve b/c of relatively small changes



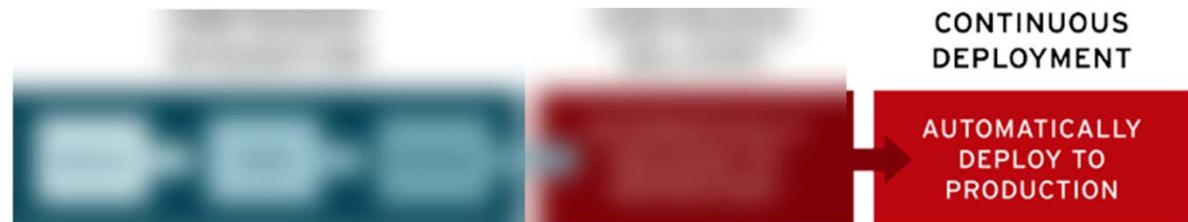
Continuous Delivery

- CI OK?
 - Continuous Delivery **automates** the release of that validated code to a repository
- So, **No CD without CI** in the pipeline!
- The main branch or *trunk* should always be '**production ready**'
- Again: **automation!**



Continuous Deployment

- Continuous Deployment automates **releasing an app to production**
- Because there is **no manual gate** at the stage of the pipeline before production, continuous deployment relies heavily on **well-designed test automation**.
- In practice: changes to a cloud application **go live within minutes** of writing it and checking in!
 - Assuming all tests are passed ;-).
- [cloud] **Tools** are often used for all three phases



Popular CI /CD Tooling options



TEKTON

tekton.dev/



www.jenkins.io/

- Open source
- On Premise
- Custom Configuration

But there is (a lot) more... for instance:

The screenshot shows the CircleCI landing page with a dark background. At the top left is the CircleCI logo. At the top right is a link to 'Log In'. Below the logo, a large headline reads 'The best CI/CD platform. Anywhere. For free.' A sub-headline below it says: 'Get the most for your minute on CircleCI. Start with up to 6,000 free build minutes per month. CircleCI is the fastest CI/CD platform available, with the most options for compute and execution environments.' To the right of this text are three sign-up buttons: 'Start building', 'Sign up with Email' (green), 'Sign up with GitHub' (grey), and 'Sign up with Bitbucket' (blue). At the bottom of the page is a footer with links for 'PRODUCT', 'SUPPORT', 'RESOURCES', 'COMPANY', and 'GETTING STARTED'.

Already have an account? [Log In](#).

The best CI/CD platform. Anywhere. For free.

Get the most for your minute on CircleCI. Start with up to 6,000 free build minutes per month. CircleCI is the fastest CI/CD platform available, with the most options for compute and execution environments.

By signing up, you are agreeing to our [SaaS Agreement](#) and [Privacy Policy](#). We ask for read/write access to make your experience seamless on CircleCI. If you are a GitHub user and aren't ready to share access to your private projects, you can choose public repos instead.

Protected by reCAPTCHA, Google [Privacy Policy](#) and [Terms of Service](#) apply.

[Start building](#)

[Sign up with Email](#)

[Sign up with GitHub](#) ▾

[Sign up with Bitbucket](#)

[PRODUCT](#) [SUPPORT](#) [RESOURCES](#) [COMPANY](#) [GETTING STARTED](#)

<https://circleci.com/>

Also: *managed CI /CD tooling*

- Provided by virtual all public cloud providers:
 - *Alibaba Cloud*
 - *Amazon Web Services (AWS)*
 - *Google Cloud Platform (GCP)*
 - *IBM Cloud*
 - *Microsoft Azure*
 - ...
- **Cloud provider** manages the infrastructure, availability, data storage, virtualization, etc.
- **Customer** writes configuration scripts, pays bill
 - \$\$\$



Other options

*Use **SAAS options**, for instance provided by
(but not limited to!):*



How?

"RTFM"

The screenshot shows the GitHub Docs interface for the "Understanding GitHub Actions" article. The left sidebar has a tree view with sections like "All products", "GitHub Actions", "Quickstart", and "LEARN GITHUB ACTIONS". Under "LEARN GITHUB ACTIONS", "Understanding GitHub Actions" is expanded, showing sub-sections: "Finding and customizing actions", "Essential features", "Expressions", "Contexts", "Environment variables", and "Workflow billing & limits". Other collapsed sections include "USING WORKFLOWS", "USING JOBS", "MANAGING WORKFLOW RUNS", "BUILD AND TEST", "DEPLOYMENT", "CONTAINERIZED SERVICES", and "PUBLISHING PACKAGES". The main content area has a breadcrumb navigation bar with "GitHub Actions / Understanding GitHub Actions". It includes a "Free, Pro, & Team" dropdown, "English" language selection, a "Sign up" button, and a search bar. The title "Understanding GitHub Actions" is prominently displayed in a large, bold font, with its entire bounding box highlighted by a red rectangle. Below the title is a brief description: "Learn the basics of GitHub Actions, including core concepts and essential terminology." A "In this article" section lists several links: "Overview", "The components of GitHub Actions", "Create an example workflow", "Understanding the workflow file", "Viewing the workflow's activity", "Next steps", "Contacting support", and "Further reading". The "Overview" section is expanded, providing a detailed description of what GitHub Actions is and how it works. The URL of the page is shown at the bottom: <https://docs.github.com/en/actions/learn-github-actions/understanding-github-actions>.

[Platform](#)[Pricing](#)[Enterprise](#)[Jamstack](#)[Community](#)[Docs](#)[Contact sales](#)[Log in](#)[Sign up →](#)

The Netlify Blog

Exploring the Jamstack and the future of web development. [Subscribe to our newsletter](#) to make sure you don't miss anything.

All posts / CI/CD

[Seeing what triggered a build for confidence in each commit](#)

Every Netlify deploy triggered by a code change includes a link to its git commit, giving you insight into what changes were responsible for the latest

NEWSLETTER

Subscribe to our newsletter to make sure you don't miss anything.

<https://www.netlify.com/tags/ci/cd/>

GitLab Docs  Search  What's new? GitLab.com (14.8-pre) Get free trial

Integrate applications >
Administer GitLab >
Use GitLab
 Set up your organization >
 Organize work with projects >
 Plan and track work >
Build your application
 Repositories >
 Merge requests >
CI/CD >
 Get started >
 Pipelines >
 Jobs >
 Variables >
 Cache and artifacts >
.gitlab-ci.yml >
Docker >
Services >
Auto DevOps >
Testing >
ES6 imports

GitLab CI/CD ALL TIERS

GitLab CI/CD is a tool for software development using the continuous methodologies:

- [Continuous Integration \(CI\)](#)
- [Continuous Delivery \(CD\)](#)
- [Continuous Deployment \(CD\)](#)

ⓘ Out-of-the-box management systems can decrease hours spent on maintaining toolchains by 10% or more. Watch our "[Mastering continuous software development](#)" webcast to learn about continuous methods and how GitLab CI/CD can help you simplify and scale software development.

Use GitLab CI/CD to catch bugs and errors early in the development cycle. Ensure that all the code deployed to production complies with the code standards you established for your app.

GitLab CI/CD can automatically build, test, deploy, and monitor your applications by using [Auto DevOps](#).

For a complete overview of these methodologies and GitLab CI/CD, read the [Introduction to CI/CD with GitLab](#).



On this page

GitLab CI/CD concepts
GitLab CI/CD configuration
GitLab CI/CD features
GitLab CI/CD examples
GitLab CI/CD Administration
Related topics
Major version changes (breaking)
14.0
13.0
12.0
11.0
10.0
Help and feedback

<https://docs.gitlab.com/ee/ci/>

Firebase

StudieMix ▾

Go to docs

?

Authentication

Firebase Database

Realtime Database

Storage

Hosting

Functions

Machine Learning

Release and monitor

Crashlytics

Performance

Test Lab

App Distribution

Analytics

Extensions

Blaze
Pay as you go

Modify

Dashboard

Health

Logs

Usage

Protect your Functions resources from abuse, such as billing fraud or phishing

Configure App Check

X

Function	Trigger	Region	Runtime	Memory	Timeout
newUserSignup	user.create	us-central1	Node.js 12	256 MB	60s
userDeleted	user.delete	us-central1	Node.js 12	256 MB	60s

<

Jenkins cd ▾

Blog Documentation ▾ Plugins Community ▾ Subprojects ▾ About ▾ English ▾ Search Download

> User Documentation Home

User Handbook

- User Handbook overview
- Installing Jenkins
- Using Jenkins
- Pipeline
- Blue Ocean
- Managing Jenkins
- Securing Jenkins
- System Administration
- Scaling Jenkins
- Appendix
- Glossary

Tutorials

- Guided Tour
- Jenkins Pipeline
- Using Build Tools

Resources

- Pipeline Syntax reference
- Pipeline Steps reference
- LTS Upgrade guides

Jenkins User Documentation

Welcome to the Jenkins user documentation - for people wanting to *use* Jenkins's existing functionality and plugin features.

If you want to *extend* the functionality of Jenkins by developing your own Jenkins plugins, please refer to the [Extend Jenkins](#) (developer documentation).

What is Jenkins?

Jenkins is a self-contained, open source automation server which can be used to automate all sorts of tasks related to building, testing, and delivering or deploying software.

Jenkins can be installed through native system packages, Docker, or even run standalone by any machine with a Java Runtime Environment (JRE) installed.

About this documentation

This documentation begins with a [Guided Tour](#) to help you get up and running with Jenkins and introduce you to Jenkins's main feature, Pipeline.

There are also [tutorials](#) geared to developers who want to orchestrate and automate building their project in Jenkins using Pipeline and Blue Ocean.

If you've never used Jenkins before or have limited Jenkins experience, then the Guided Tour and introductory tutorials are good places to start.

If you are looking for more detailed information about using Jenkins, please refer to the [User Handbook](#).

Documentation scope

Jenkins is a highly extensible product whose functionality can be extended through the installation of plugins.

<https://www.jenkins.io/doc/>



CI/CD Example

Our choice: Netlify + Heroku

Backend hosting – a node.js hosting provider

The screenshot shows the Heroku homepage. At the top left is the Heroku logo and navigation links for Products, Marketplace, Pricing, Documentation, Support, COVID-19, and More. On the right are a search bar, a login or sign-up button, and an Incognito mode icon. The main visual is a stylized illustration of a city skyline with clouds and a central hexagonal cube containing a snowflake, symbolizing data management. Below the illustration is a horizontal ellipsis. A section titled "SPOTLIGHT" features the heading "Data on Heroku" and the subtext "Build data-driven apps with fully managed data services." It includes a "Sign Up for Free" button and a link to "Explore Managed Data Services". At the bottom, a section titled "OFFICIALLY SUPPORTED LANGUAGES" displays icons for Node.js, Ruby, Java, PHP, Python, Go, Scala, and Clojure.

Cloud Application Platform | Heroku

heroku.com

Salesforce Developers / Heroku

HEROKU Products ▾ Marketplace ▾ Pricing Documentation Support COVID-19 ▾ More ▾

Log in or Sign up

SPOTLIGHT

Data on Heroku

Build data-driven apps with fully managed data services.

[Sign Up for Free](#)

[Explore Managed Data Services](#)

OFFICIALLY SUPPORTED LANGUAGES

Node.js Ruby Java PHP Python Go Scala Clojure

<https://www.heroku.com/>

Step 1. Deploy Backend to SAAS

We're using Heroku here with Github as VCS – [sign up for an account!](#)

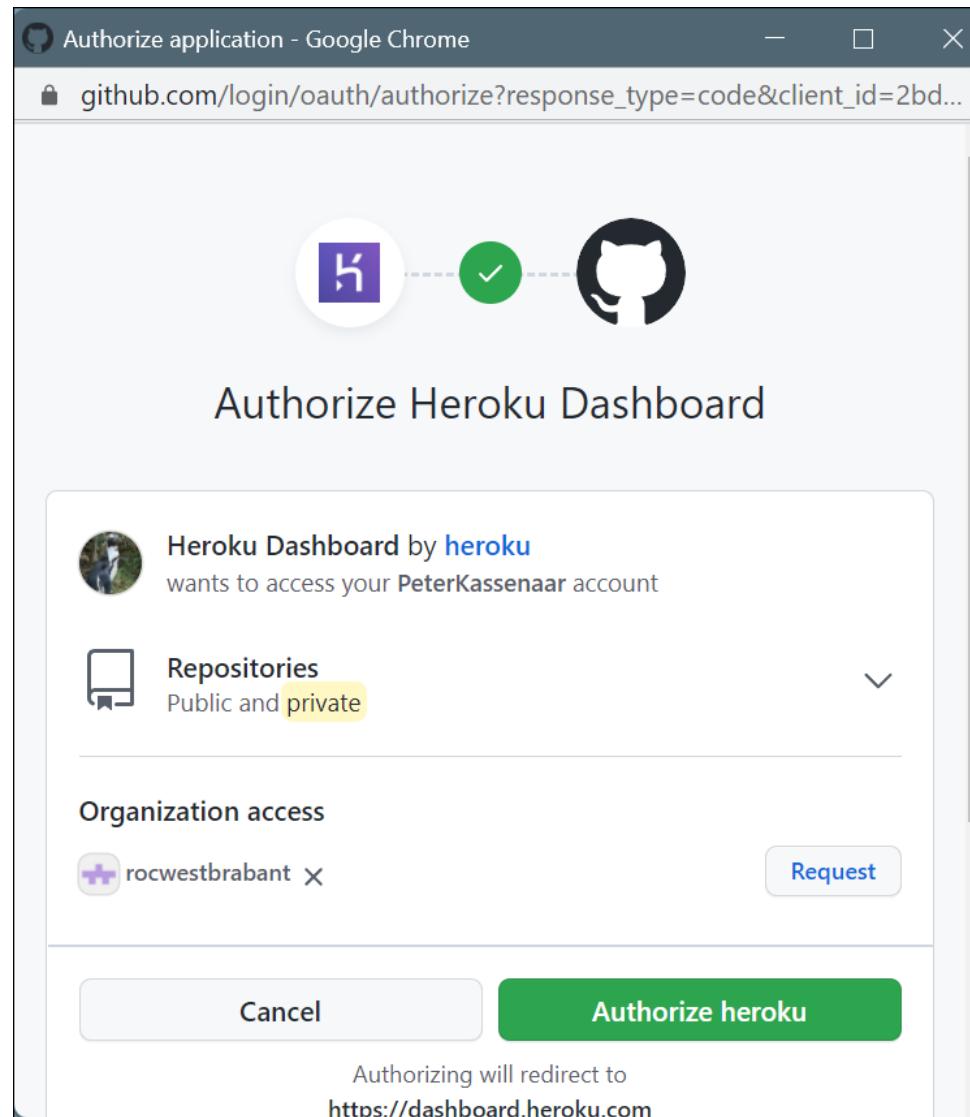
The screenshot shows the Heroku Platform interface for deploying a microservice named "pk-microservice". A red box highlights the top navigation bar, which includes the Salesforce Platform logo, the Heroku logo, and the application name "pk-microservice". Below the navigation bar, there are tabs for Overview, Resources, Deploy, Metrics, Activity, Access, and Settings. The "Deploy" tab is currently selected.

The main area displays two sections: "Add this app to a pipeline" and "Add this app to a stage in a pipeline to enable additional features". The "Choose a pipeline" dropdown menu is open, showing the "GitHub" option highlighted with a red arrow. Other options include "Heroku Git" and "Container Registry".

Below these sections, there are two main sections: "Deployment method" and "Connect to GitHub". Under "Deployment method", there is a "GitHub" button labeled "Connect to GitHub". Under "Connect to GitHub", there is a "Heroku Git" button labeled "Use Heroku CLI".

At the bottom of the page, there are three sections: "View your code diffs on GitHub", "Deploy changes with GitHub", and "Automatic deploys from GitHub".

1a. Authorize external apps



1b. Connect correct repo

The screenshot shows the Heroku Dashboard interface for connecting a GitHub repository. At the top, there's a section titled "Deployment method" with three options: "Heroku Git" (using the Heroku CLI), "GitHub" (with a "Connect to GitHub" button highlighted by a red arrow), and "Container Registry" (using the Heroku CLI). Below this, under "Connect to GitHub", there's a sub-section titled "Search for a repository to connect to". It includes a dropdown menu showing "PeterKassenaar" and a search bar containing "pk-micrd". A red box highlights the search result "PeterKassenaar/pk-microservice". To the right of this result is a "Connect" button.

Deployment method

Heroku Git
Use Heroku CLI

GitHub
Connect to GitHub

Container Registry
Use Heroku CLI

Connect to GitHub

Search for a repository to connect to

PeterKassenaar

pk-micrd

Missing a GitHub organization? [Ensure Heroku Dashboard has team access](#).

PeterKassenaar/pk-microservice

Connect

1c. Automatic deploys

Automatic deploys

Enables a chosen branch to be automatically deployed to this app.

You can now change your main deploy branch from "master" to "main" for both manual and automatic deploys, please follow the instructions [here](#).

Enable automatic deploys from GitHub

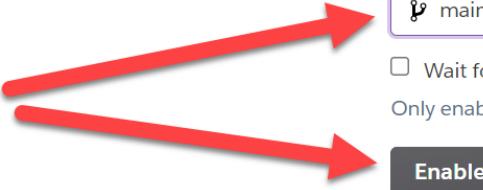
Every push to the branch you specify here will deploy a new version of this app. **Deploys happen automatically:** be sure that this branch is always in a deployable state and any tests have passed before you push. [Learn more](#).

Choose a branch to deploy

main

Wait for CI to pass before deploy
Only enable this option if you have a Continuous Integration service configured on your repo.

Enable Automatic Deploys



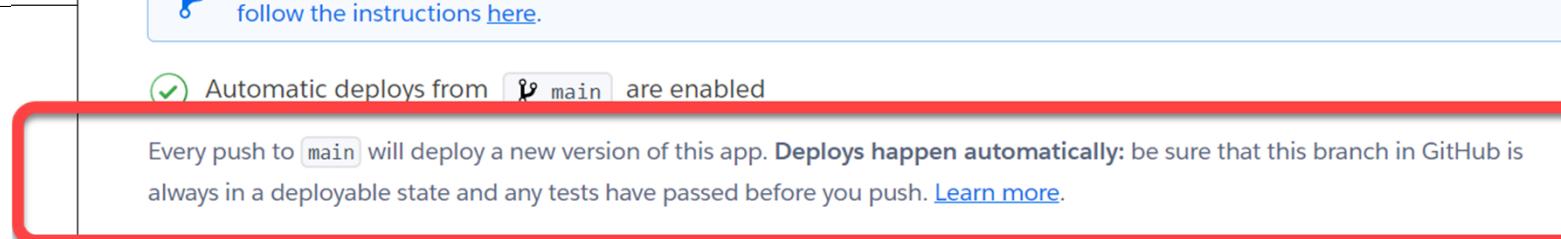
You can now change your main deploy branch from "master" to "main" for both manual and automatic deploys, please follow the instructions [here](#).

Automatic deploys from main are enabled

Every push to `main` will deploy a new version of this app. **Deploys happen automatically:** be sure that this branch in GitHub is always in a deployable state and any tests have passed before you push. [Learn more](#).

Wait for CI to pass before deploy
Only enable this option if you have a Continuous Integration service configured on your repo.

Disable Automatic Deploys



Optional – check result

The screenshot shows a GitHub repository page for 'pk-microservice'. The 'Activity' tab is selected, highlighted with a green border. A red box highlights the 'Activity Feed > Build Log' section. The build log details the deployment process:

```
-----> Caching build
- node_modules

-----> Pruning devDependencies

    up to date, audited 211 packages in 1s

    19 packages are looking for funding
    run `npm fund` for details

    found 0 vulnerabilities

-----> Build succeeded!
-----> Discovering process types
    Procfile declares types      -> (none)
    Default types for buildpack -> web
-----> Compressing...
    ...
-----> Launching...
    Released v3
    https://pk-microservice.herokuapp.com/ deployed to Heroku

Build finished
```

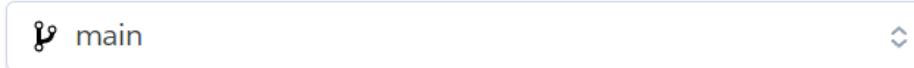
The build log ends with 'Build finished'. The top right of the page shows a star icon, 'Open app' button, and 'More' dropdown.

1d. First Deploy

Deploy a GitHub branch

This will deploy the current state of the branch you specify below. [Learn more.](#)

Choose a branch to deploy

 main 

Receive code from GitHub 

Build main `7cc4b1a9` 

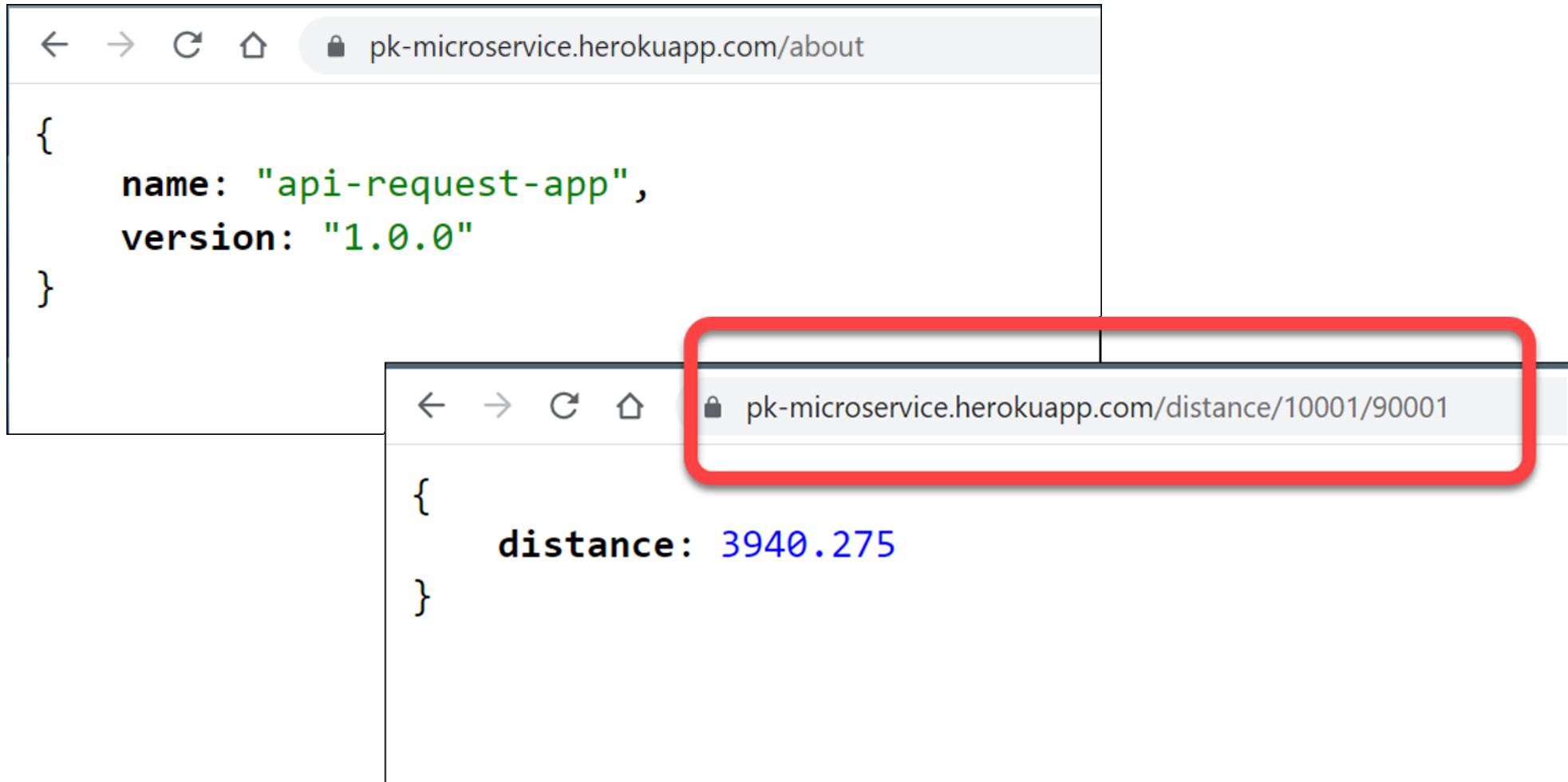
Release phase 

Deploy to Heroku 

Your app was successfully deployed.



1e. Run the app



1f. Update the app – push to github

Every commit to github is picked up by Heroky and
Continuously Deployed

Latest activity

The screenshot shows a list of recent events. The first event is highlighted with a red box. It is a build log entry from 'info@kassenaar.com' stating 'Build in progress' just now, with a link to 'View build progress'. The second event is a deployment log from 'info@kassenaar.com' stating 'Deployed' at 'Today at 2:27 PM · v3', with a deployment icon and a link to the commit hash '7cc4b1a9'.

... info@kassenaar.com: Build in progress
Just now · [View build progress](#)

 info@kassenaar.com: Deployed 7cc4b1a9
Today at 2:27 PM · v3

The screenshot shows a list of recent events. The first event is highlighted with a red box. It is a deployment log from 'info@kassenaar.com' stating 'Deployed' at 'Today at 2:36 PM · v4', with a deployment icon and a link to 'Compare diff'. The second event is a build log from 'info@kassenaar.com' stating 'Build succeeded' at 'Today at 2:36 PM', with a build icon and a link to 'View build log'.

 info@kassenaar.com: Deployed 1401ecc0
Today at 2:36 PM · v4 · [Compare diff](#)

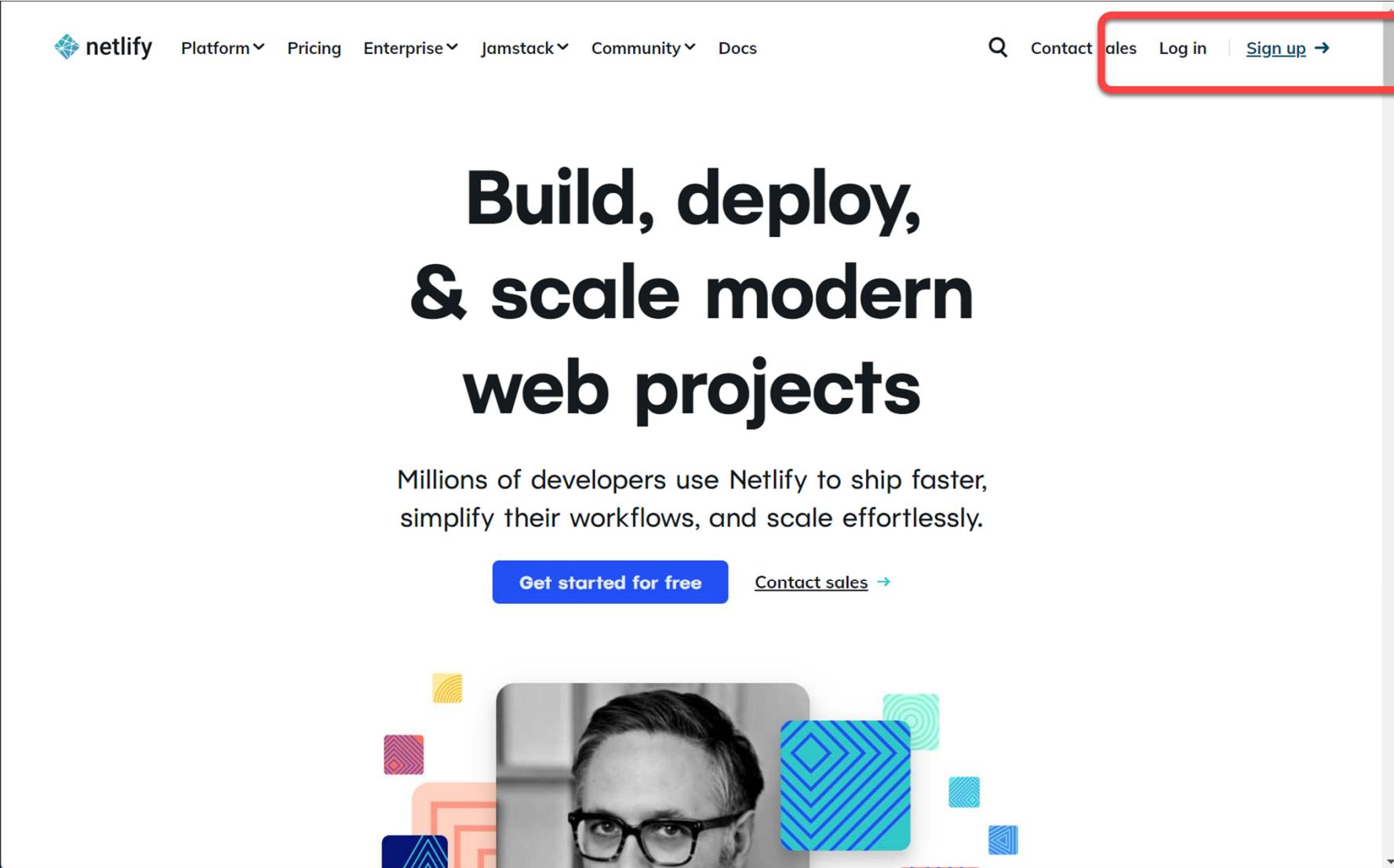
 info@kassenaar.com: Build succeeded
Today at 2:36 PM · [View build log](#)



Frontend Hosting

Update your frontend to use the CI/CD'd backend

Step 2. Frontend hosting - Netlify



The screenshot shows the Netlify homepage. At the top, there is a navigation bar with the Netlify logo, a search icon, and links for Platform, Pricing, Enterprise, Jamstack, Community, and Docs. To the right of the navigation bar is a red rectangular box highlighting the "Sign up →" link. Below the navigation bar, the main headline reads "Build, deploy, & scale modern web projects". A subtext below the headline states, "Millions of developers use Netlify to ship faster, simplify their workflows, and scale effortlessly." At the bottom of the main content area is a blue button labeled "Get started for free" and a link labeled "Contact sales →". The background features a black and white portrait of a man wearing glasses, surrounded by colorful geometric shapes.

<https://www.netlify.com/>

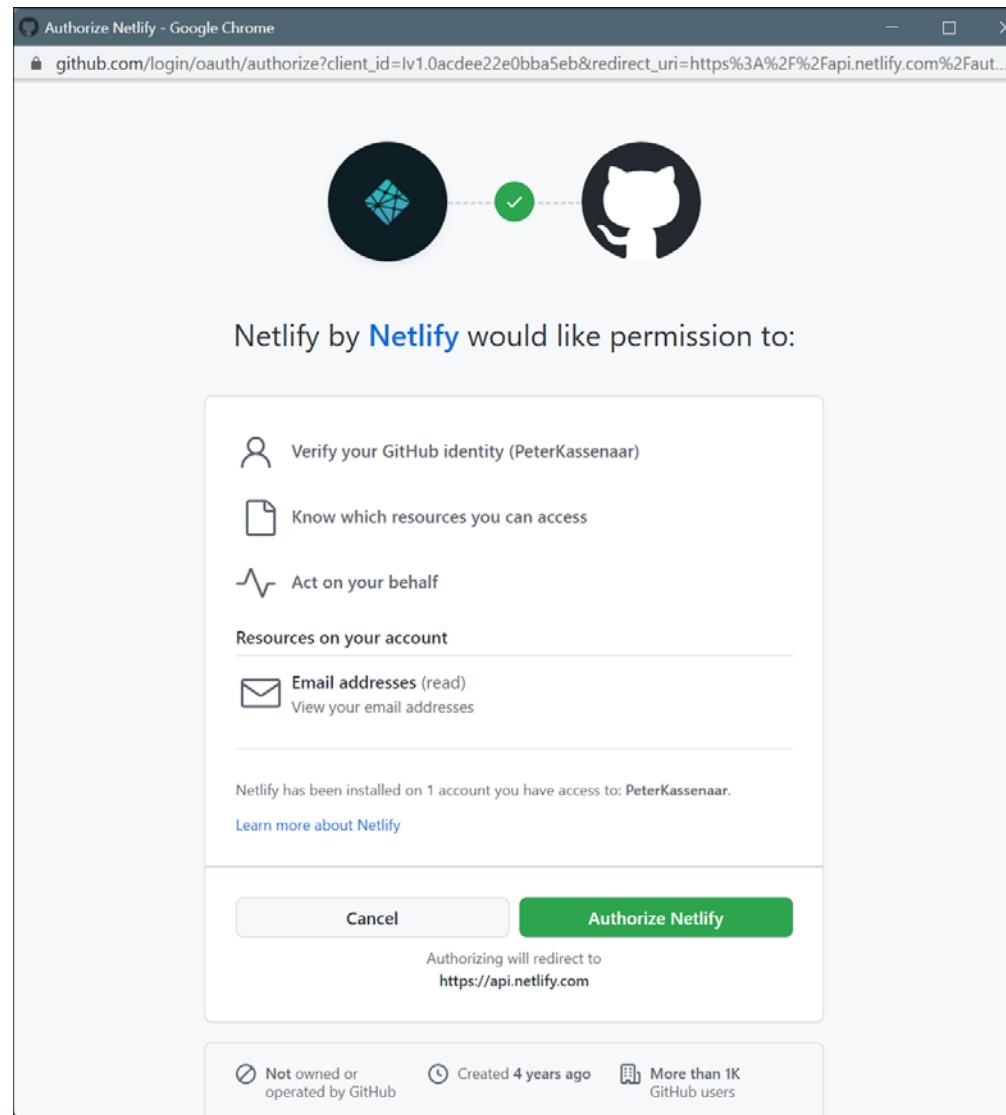
Our choice – again, connect to Github

We're connecting to a [different repo](#).

You can also connect to [different branches](#) in the same repository

The screenshot shows the Netlify interface for importing a project. At the top, there's a header with a team icon, the name "Peter Kassenaar's team", and a dropdown arrow. To the right are "Upgrade", a bell icon, a circular progress bar, and a user profile picture. Below the header is a red-bordered box containing the text "Import an existing project from a Git repository" and "From zero to hero, three easy steps to get your site on Netlify." Below this box are three numbered steps: "1. Connect to Git provider", "2. Pick a repository", and "3. Site settings, and deploy!". A large red arrow points from the bottom left towards the "GitHub" button. The "GitHub" button is black with white text and has a small icon of a person inside a circle. Next to it are "GitLab" (orange button) and "Bitbucket" (blue button). At the bottom, there's a link "Don't have a project yet? [Start from a template instead.](#)"

2a. Authorize platform



2b. Import from github

The screenshot shows the Netlify import wizard interface. At the top, it displays "Peter Kassenaar's team" with a dropdown arrow, a purple "Upgrade" button, and a user profile icon. Below this, the main title is "Import an existing project from a Git repository" with the subtitle "From zero to hero, three easy steps to get your site on Netlify." A progress bar at the bottom indicates the steps: "1. Connect to Git provider", "2. Pick a repository", and "3. Site settings, and deploy!". The "2. Pick a repository" step is currently active. On the left, there's a sidebar for "PeterKassenaar" showing repositories: "pk-microservice" and "pk-microservice-frontend". The "pk-microservice-frontend" repository is highlighted with a red border. A search bar at the top right contains the text "pk-micro". Below the sidebar, a message says "Can't see your repo here? Configure the Netlify app on GitHub.".

Peter Kassenaar's team

Upgrade

Import an existing project from a Git repository

From zero to hero, three easy steps to get your site on Netlify.

1. Connect to Git provider 2. Pick a repository 3. Site settings, and deploy!

Pick a repository from GitHub

Choose the repository you want to link to your site on Netlify. When you push to Git, we run your build tool of choice on our servers and deploy the result.

PeterKassenaar

pk-micro

PeterKassenaar/pk-microservice

PeterKassenaar/pk-microservice-frontend

Can't see your repo here? [Configure the Netlify app on GitHub](#).

2c. Enter deployment details

The screenshot shows the Netlify site settings interface for a project named "pk-microservice-frontend". The top navigation bar includes "Peter Kassenaar's team", "Upgrade", and other account options. A progress bar at the top indicates three steps: "1. Connect to Git provider", "2. Pick a repository", and "3. Site settings, and deploy!". The main section is titled "Site settings for PeterKassenaar/pk-microservice-frontend" and describes how to get more control over builds and deploys. It shows the "Owner" set to "Peter Kassenaar's team" and the "Branch to deploy" set to "main". Under "Basic build settings", it says "If you're using a static site generator or build tool, we'll need these settings to build your site." A link "Learn more in the docs" is provided. The "Publish directory" field contains "dist/ng-request/" and is highlighted with a red rectangle. A "Show advanced" button is at the bottom.

Make sure to use the correct settings – which of course depends on your technology of choice

2d. Deploy

The screenshot shows the Heroku deployment history for the Production environment. It highlights three specific deployments with red arrows pointing to them:

- Production: main@HEAD Starting Up** (Status: Starting Up)
2:57 PM: No deploy message
- Production: main@04e94dc Building** (Status: Building)
Updated Styles packages
- Production: main@ff37fa4 Published** (Status: Published)
Updated Heroku URL

Below the deployment list, there are settings for the current deployment:

- Deploy settings
- Notifications
- Stop auto publishing

At the bottom of the screen, there is a footer bar with the Heroku logo and other navigation links.

Optional – chance site settings



Peter Kassenaar's team > pk-microservice

Upgra

Site overview Deployes Plugins Functions Identity Forms Large Media Split Testing Analytics Site settings

Settings for pk-microservice

[pk-microservice.netlify.app](#)

Deploys from [GitHub](#). Owned by [Peter Kassen](#)

Last update at 3:10 PM (a few seconds ago)



Site details

General information about your site

Site information

Site name:	pk-microservice
Owner:	Peter Kassenaar's team
API ID:	bc038900-2440-47df-b11b-dbc010f0f9f7
Created:	Today at 2:57 PM
Last update:	Today at 3:10 PM

[Change site name](#) [Transfer site ▾](#)

Change site name

Transfer site ▾

2e. Run your app

A NaRequest

pk-microservice.netlify.app

Measure distance between US Zipcodes

Enter two valid US Zipcodes:

10001

90001

Get distance Clear

Some example cities/zipcodes

City	Zip
New York	10001-10090
Chicago	60007-60027
Los Angeles	90001-90090
Seattle	98101-98117
Denver	80014-80211
Miami	33101-33136

Distance

Distance between **10001** and **90001** in kilometer:

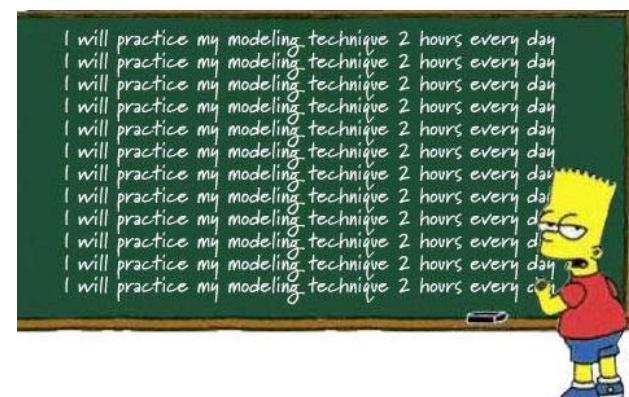
3940.275

Error? Read the logs!

	Deploy log
68	2:58:22 PM:
69	2:58:22 PM: \$ npm run build
70	2:58:23 PM: > ng-request@0.0.0 build
71	2:58:23 PM: > ng build
72	2:58:27 PM: - Generating browser application bundles (phase: setup)...
73	2:58:51 PM: ✓ Browser application bundle generation complete.
74	2:58:51 PM: ✓ Browser application bundle generation complete.
75	2:58:51 PM:
76	2:58:51 PM: Warning: /opt/build/repo/src/app/app.component.css exceeded maximum budget. Budget 2.00 kB was not met by 155.38 kB with a total of 157.38 kB.
77	2:58:51 PM:
78	2:58:51 PM:
79	2:58:51 PM:
80	2:58:51 PM: Error: /opt/build/repo/src/app/app.component.css exceeded maximum budget. Budget 4.00 kB was not met by 153.38 kB with a total of 157.38 kB.
81	2:58:51 PM:
82	2:58:51 PM:
83	2:58:51 PM:
84	2:58:51 PM: _____
85	2:58:51 PM: "build.command" failed
86	2:58:51 PM: _____
87	2:58:51 PM:
88	2:58:51 PM: Error message
89	2:58:51 PM: Command failed with exit code 1: npm run build
90	2:58:51 PM:
91	2:58:51 PM: Error location
92	2:58:51 PM: In Build command from Netlify app:
93	2:58:51 PM: npm run build
94	2:58:51 PM:
95	2:58:51 PM: Resolved config
96	2:58:51 PM: build:
97	2:58:51 PM: command: npm run build
98	2:58:51 PM: commandOrigin: ui
99	2:58:51 PM: publish: /opt/build/repo/dist/ng-request
100	2:58:51 PM: publishOrigin: ui
101	2:58:52 PM: Caching artifacts
102	2:58:52 PM: Started saving node modules
103	2:58:52 PM: Finished saving node modules
104	2:58:52 PM: Started saving build plugins
105	2:58:52 PM: Finished saving build plugins
106	2:58:52 PM: Started saving pip cache
107	2:58:52 PM: Finished saving pip cache
108	2:58:52 PM: Started saving emacs cask dependencies
109	2:58:52 PM: Finished saving emacs cask dependencies
110	2:58:52 PM: Started saving maven dependencies

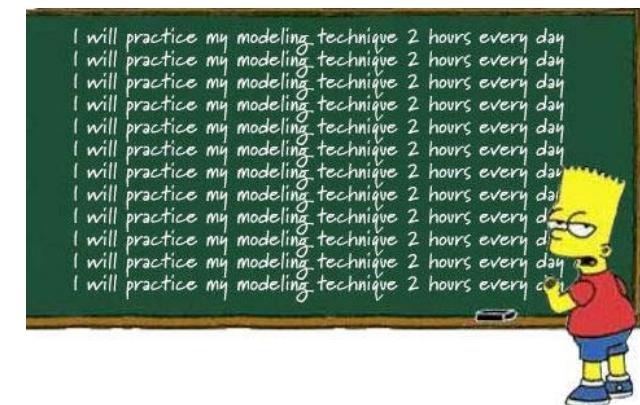
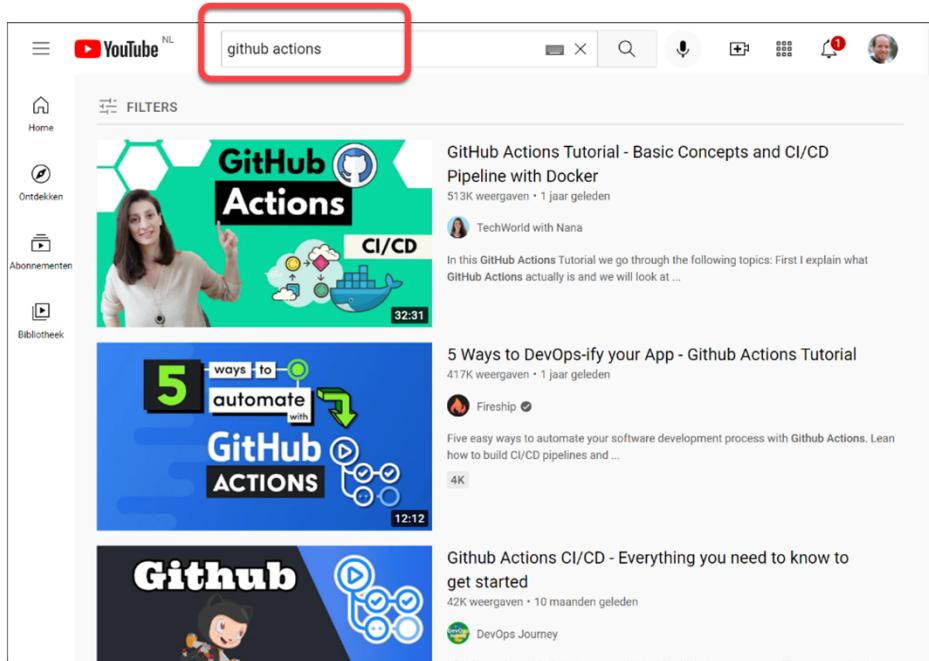
Mini workshop

- Go ahead and [publish your own application\(s\)](#) to an online CI/CD provider
- You can use [Heroky/Netlify](#) if you built a web app, or choose a platform to your liking.
- Show/send the [URL of your deployed app](#) to your colleagues / or chatbox



Mini workshop

- Pick a platform of your choice
 - (for instance: [Github](#), [Azure](#), [AWS](#), ...)
- Go to [YouTube](#) and find some CI/CD-videos on the matter
- OR: go to platform and read [CI/CD-documentation](#)



Questions?