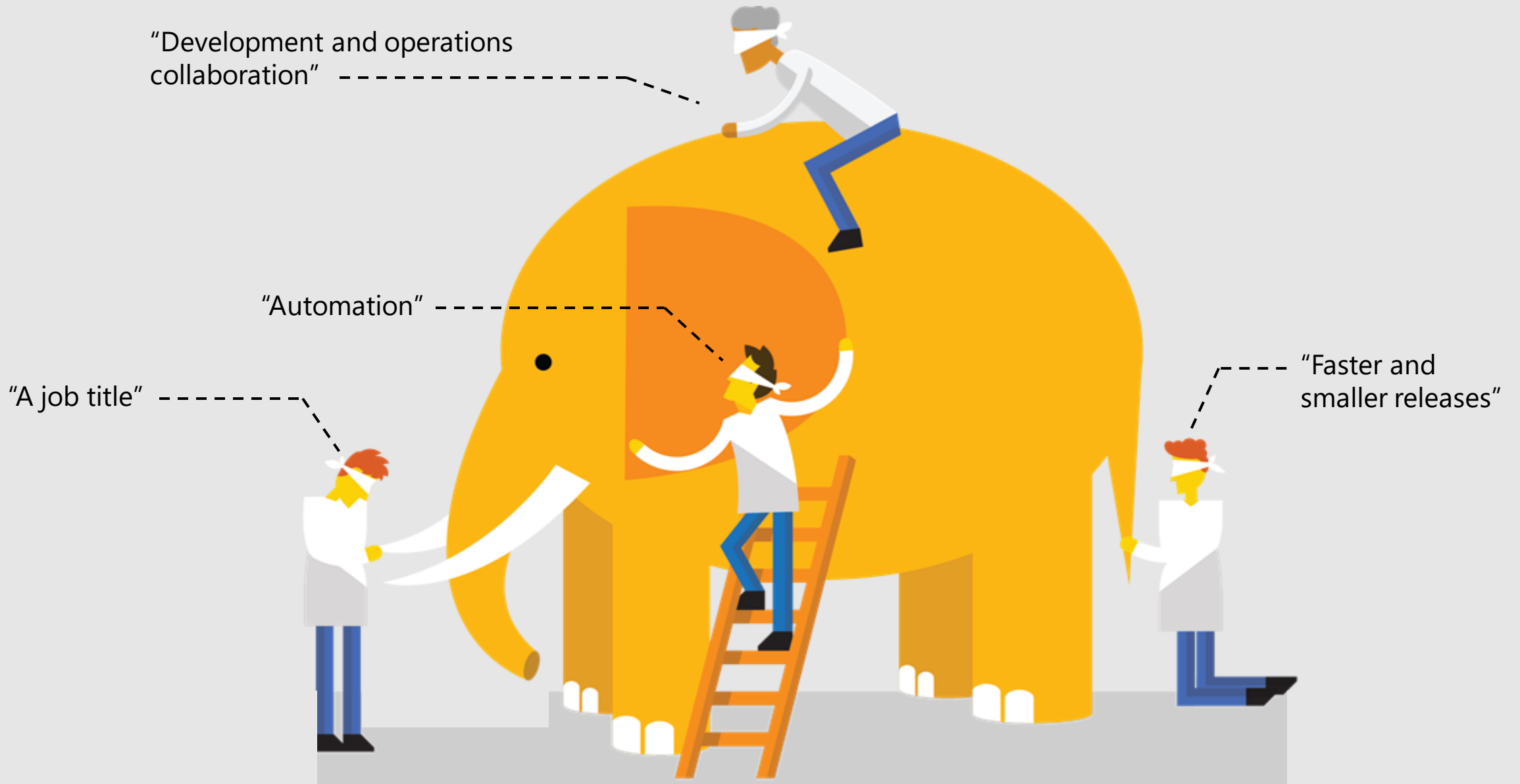




DevOps with GitHub

Simona Toader | Cloud Solution Architect

What is DevOps?



The Plan: Flawless Execution



The Reality: Environments differ



A Partial Solution: The Right Tools



A Partial Solution: Team



<http://devopsreactions.tumblr.com>

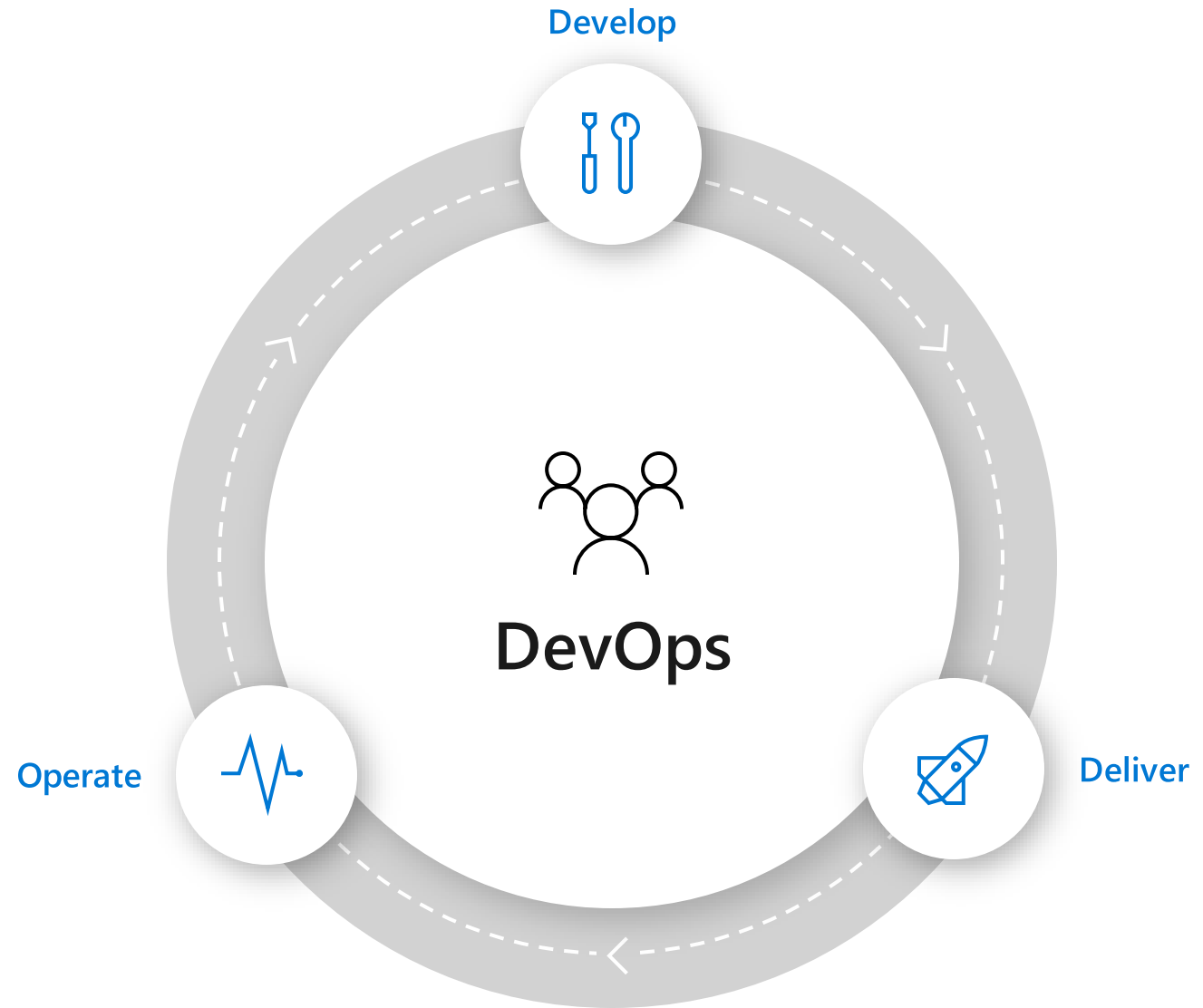
Full Solution: Tools, Team and Process

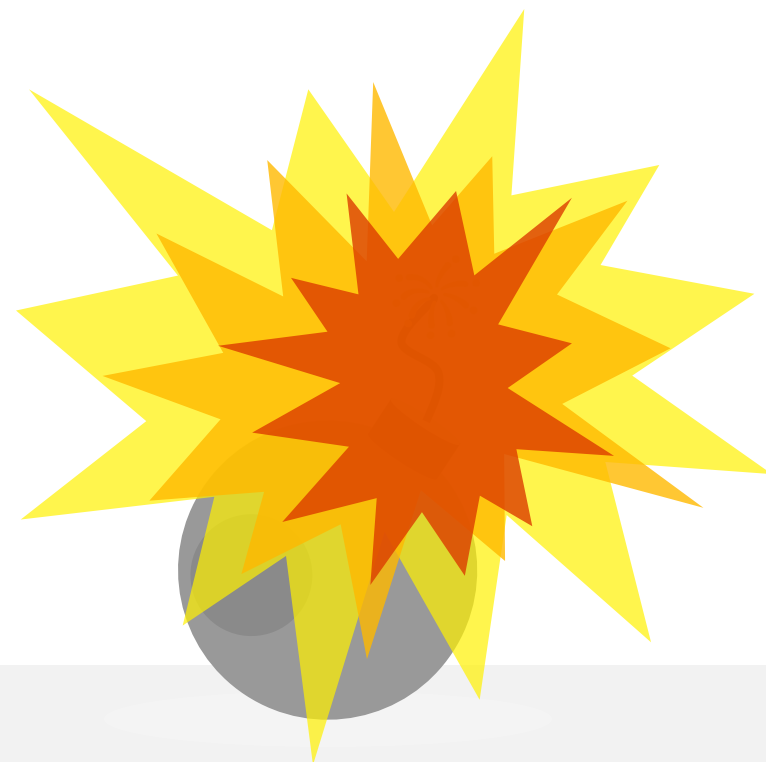
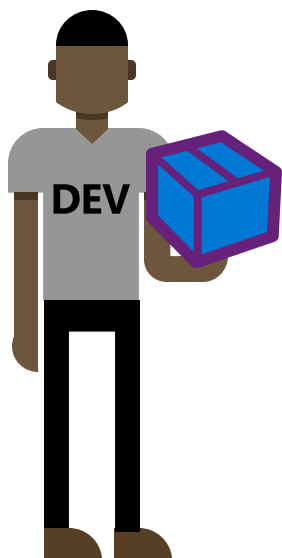


What is DevOps

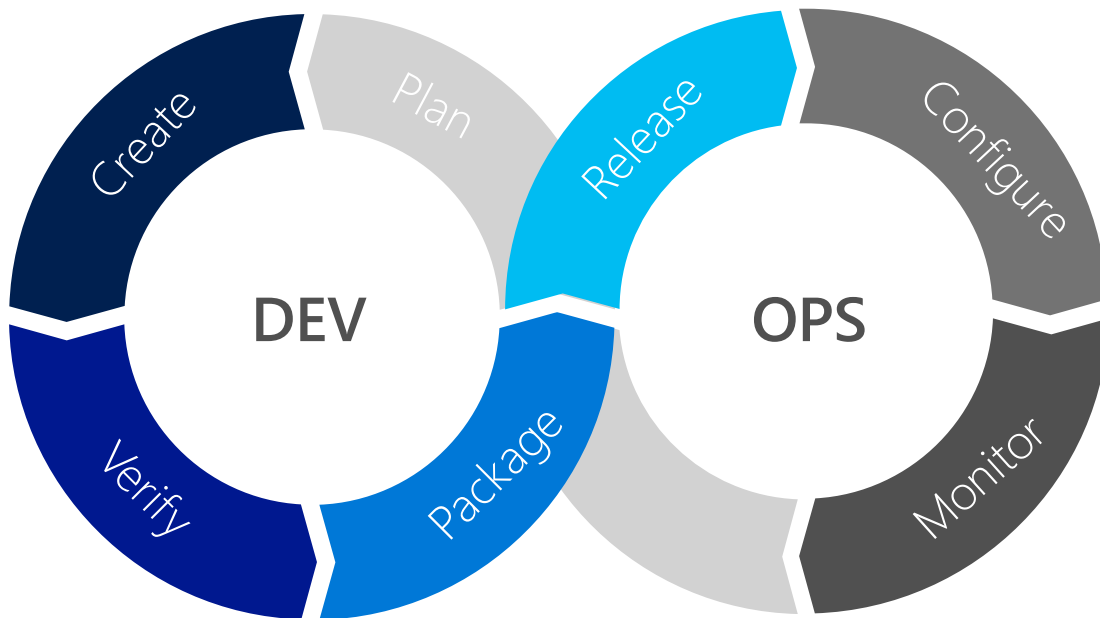


DevOps is the union of **people**, **process**, and **products** to enable continuous delivery of value to your end users.










DevOps is here... and driving business value



Organizations realizing up to 20% improvements in..

-  Time-to-market
-  Software quality
-  Frequency of deployment
-  Increased revenue
-  Customer reach and retention

Continuous Integration (CI)

SOURCE
REPOSITORY



BUILD



TEST



Issues

Delivery delays

Non-working/low-quality code

Incomplete solutions

Rework

Value

Frequent integration

Higher quality

Repeatability



Continuous Integration

Version Control System

Branching Strategy

Automated Build

CI Goals:

- #1: Harness collaboration
- #2: Enable parallel development
- #3: Minimize integration debt
- #4: Act as a quality gate
- #5: Automate Everything!

Continuous Integration Practices



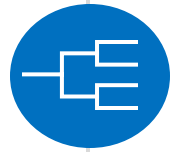
Multi-Repo



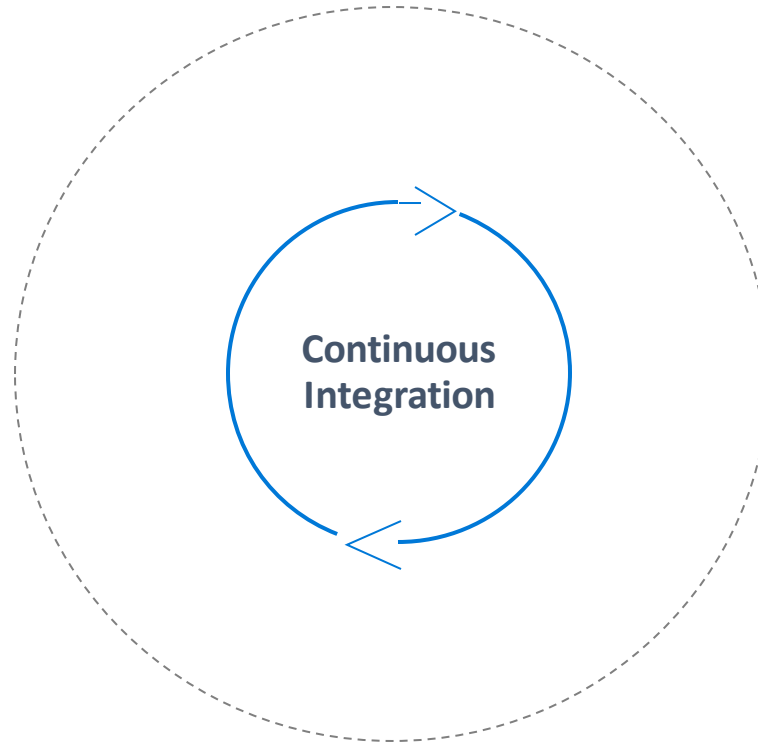
Trunk Based Branching



Branch Policies



Parallel Builds



Culture & Collaboration



Unit Testing



Pull Requests



Security Scanning



Continuous Delivery (CD)

SOURCE
REPOSITORY



DEVELOPMENT



STAGING



PRODUCTION



Issues

Slow delivery cadence

Limited predictability when deploying

Complexity when deploying

Value

Consistency

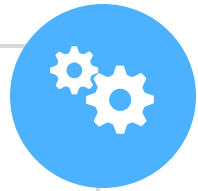
Accelerated deployment

Repeatability

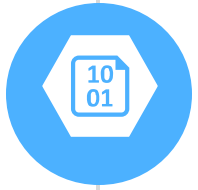
Human error reduction



Continuous Delivery Practices



Automated Builds



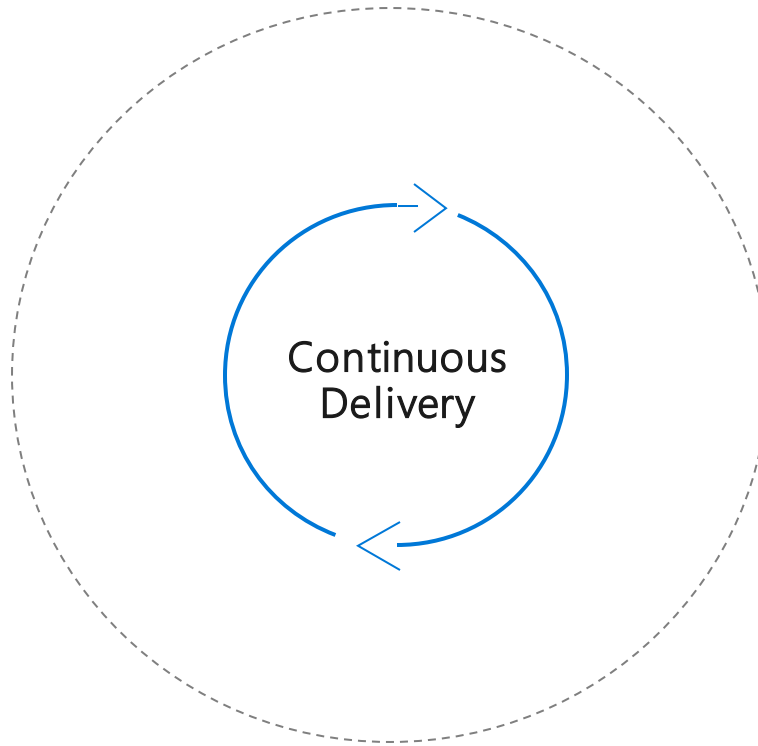
Build Once



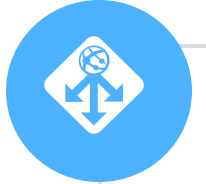
Trunk Always Prod Ready



Fix Immediately



Everything in Source Control



Feature Flags

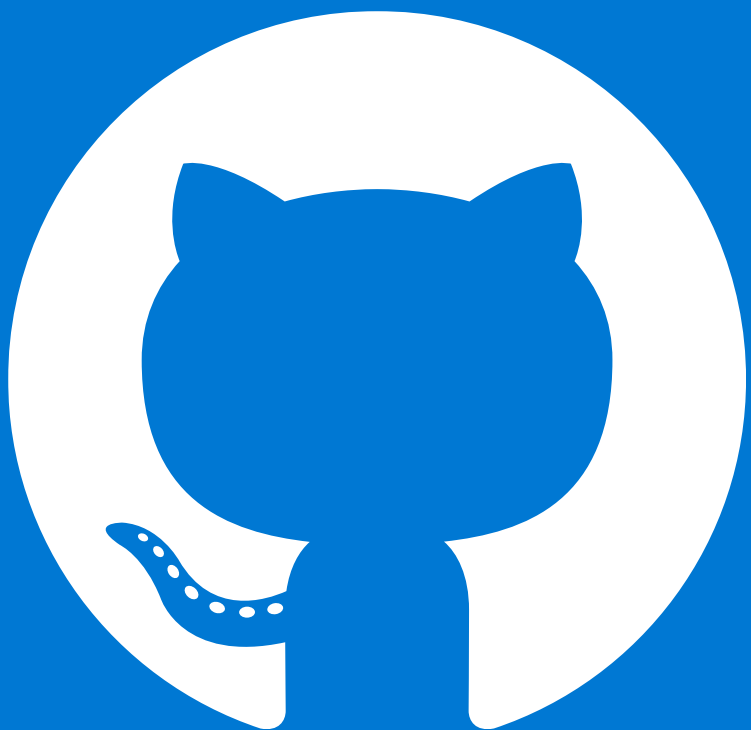


Blue/Green Deploy



Canary Deployment





GitHub is a critical partner for your Digital Transformation



Team Collaboration

Bring open source code, culture, and best practices into your org



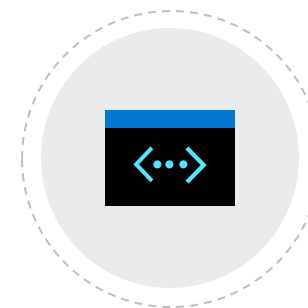
Security & Compliance

Securely integrate open source code in your software



Developer Talent

Attract and retain the best talent with tools developers know and love



Code-to-Cloud DevOps

Automate workflows from code to any cloud

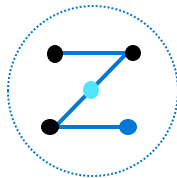
Team Collaboration

Bring open source culture and best practices into your organization



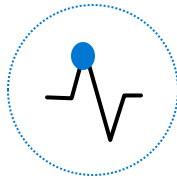
Increased collaboration

Empower teams to collaborate within your organization



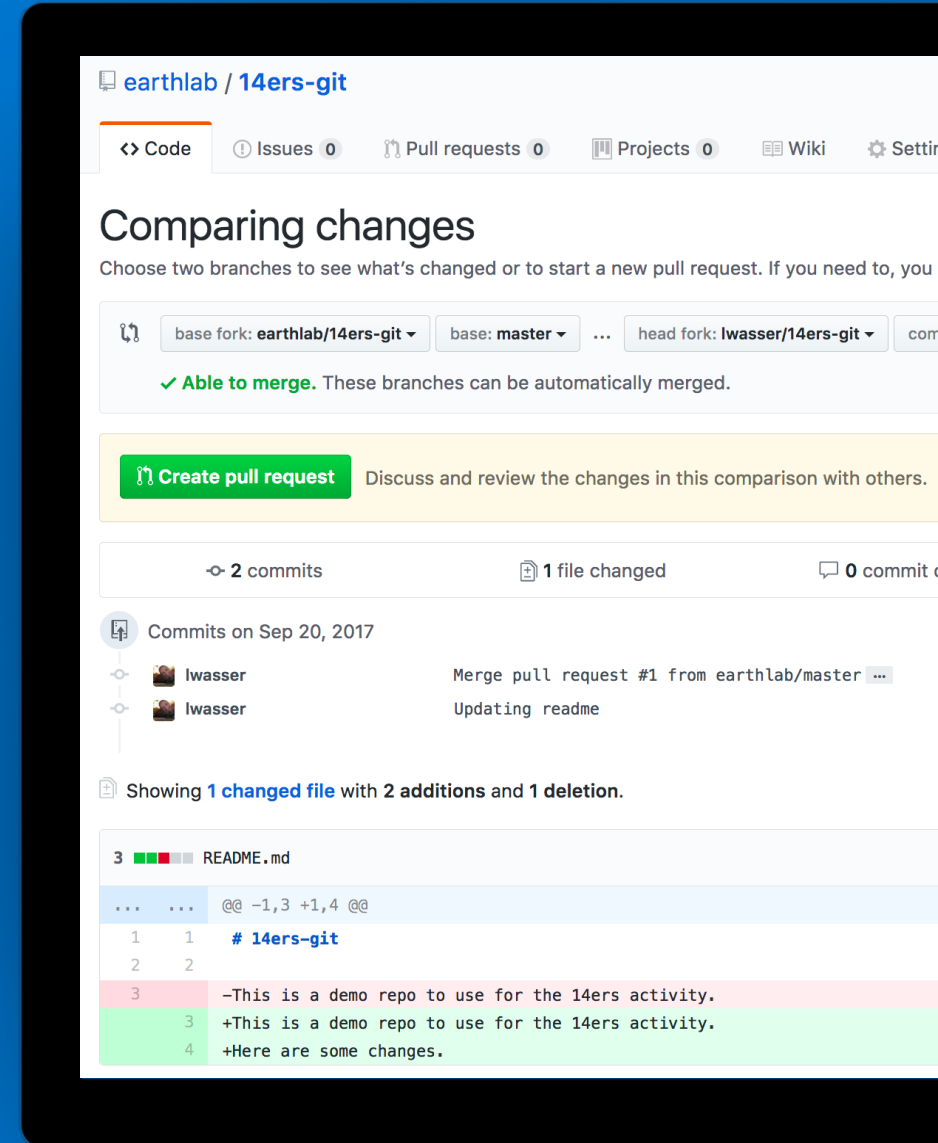
Breaking silos

Simplified collaboration across teams, sharing of knowledge, improved code reuse, and secured workflows



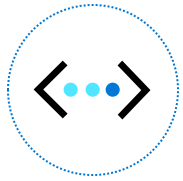
Team Insights

Visibility into team metrics and actionable recommendations to improve team effectiveness and collaboration



Security & Compliance

Identify early, resolve rapidly



Secure use of Open Source

Dependency Insights and automated security fixes help keep your dependencies secure and up-to-date



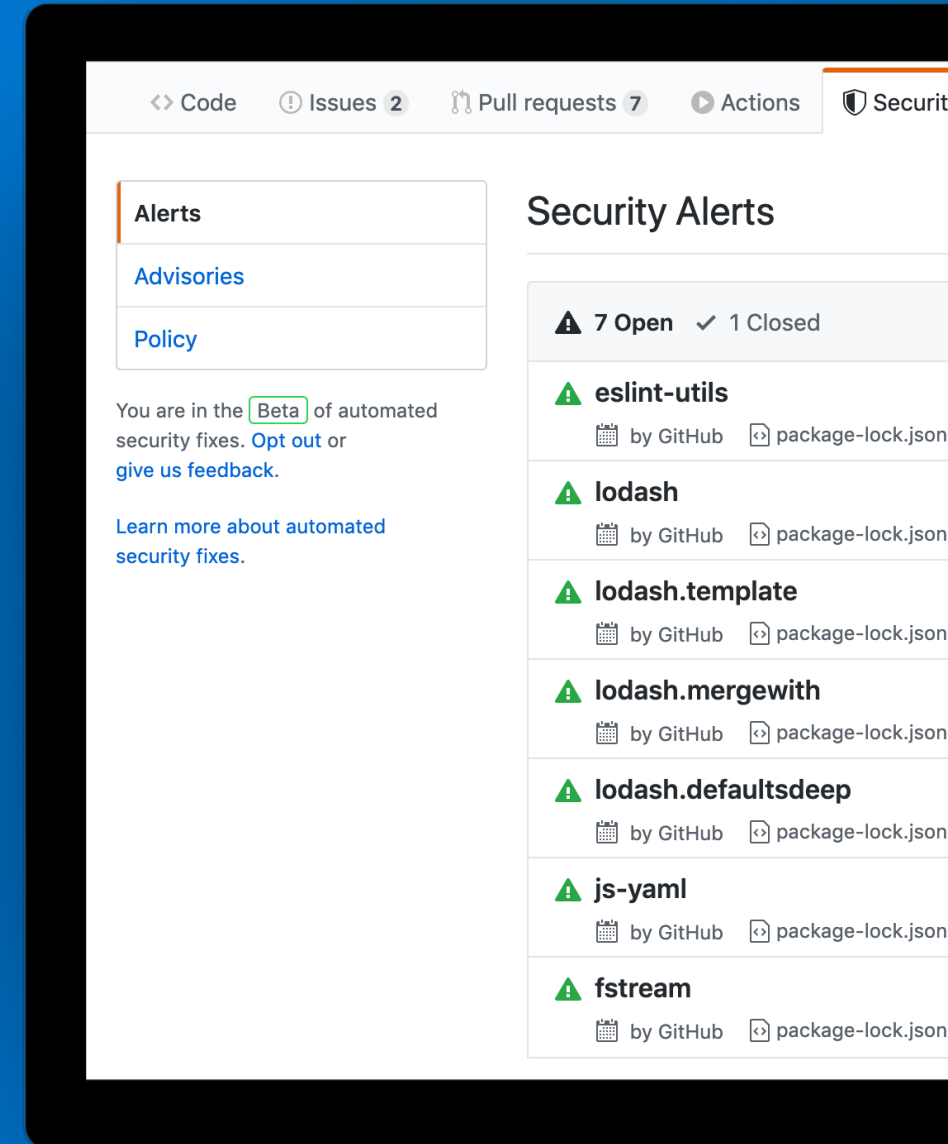
Pattern based security analysis

Always-on security analysis with GitHub Advanced Security scanning both open source repositories and enterprise code



Global community for security

Integrated into the National Vulnerability Database, MITRE, and WhiteSource for up-to-date security information



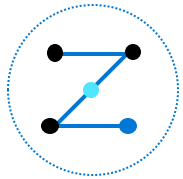
Developer Talent

Attract and Grow Your Teams



Get connected

Recruit top developers to your team and make them feel at home with the platform and processes they already know and love.



Stay connected

Make it easy for your team to work on the projects they care about—whether open source or internal code

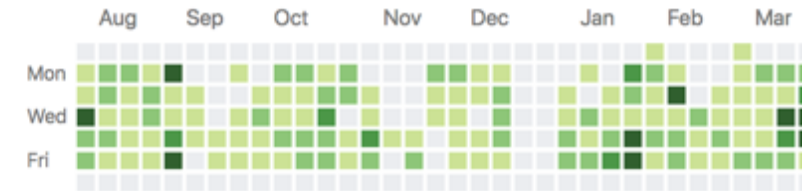


Get started, faster

Provide developers with the platform they prefer and are familiar with can reduce on-boarding time by 40%

Total Economic Impact of GitHub, Forrester Consulting 2020

1,877 contributions in the last year



[Learn how we count contributions.](#)



@github



@octo-org



@octobox

More

Activity overview

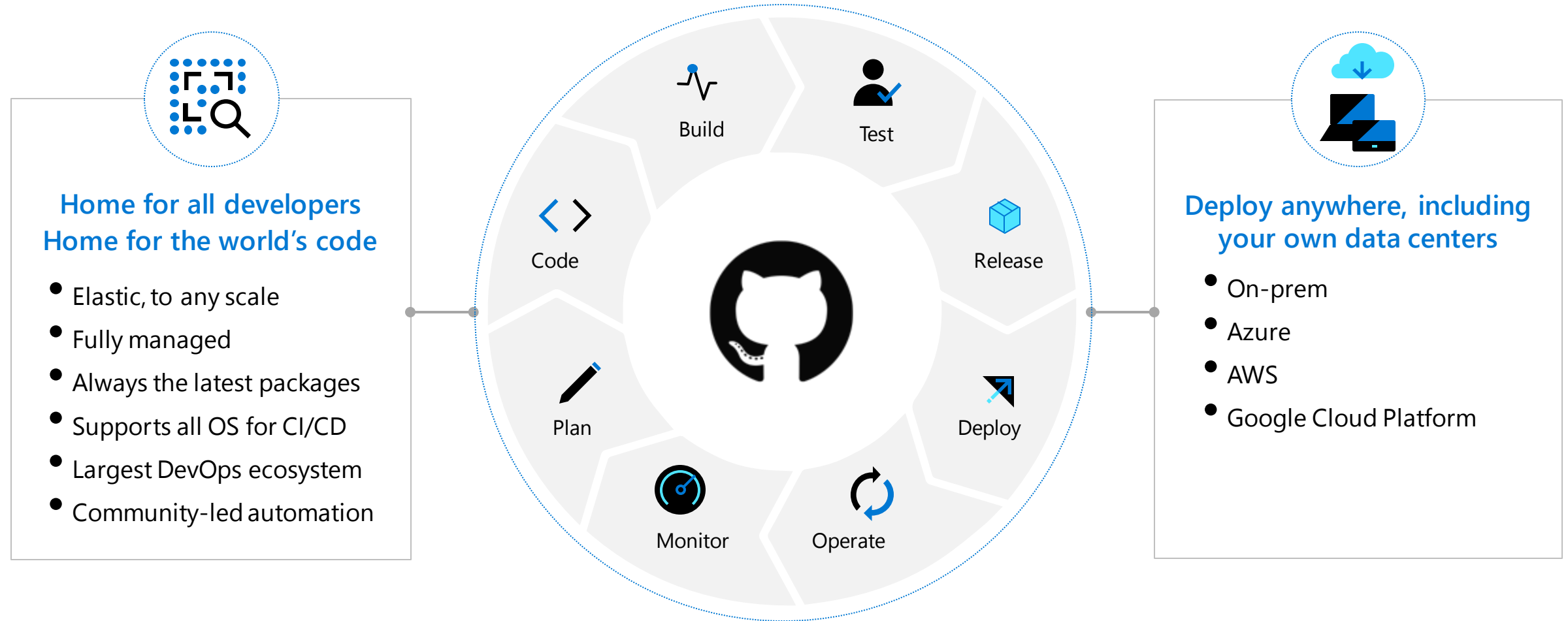


Contributed to [github/help-docs](#),
[github/product-documentation](#),
[mclark/my-test](#)
and 5 other repositories

33%
Comm

Code-to-Cloud DevOps

Automating workflows from code to any cloud



Automated Delivery

Automating workflows from code to cloud



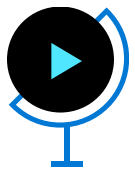
Accelerate delivery through automation

Automation triggers for 20+ project events allows for automation beyond just CI/CD to any available API



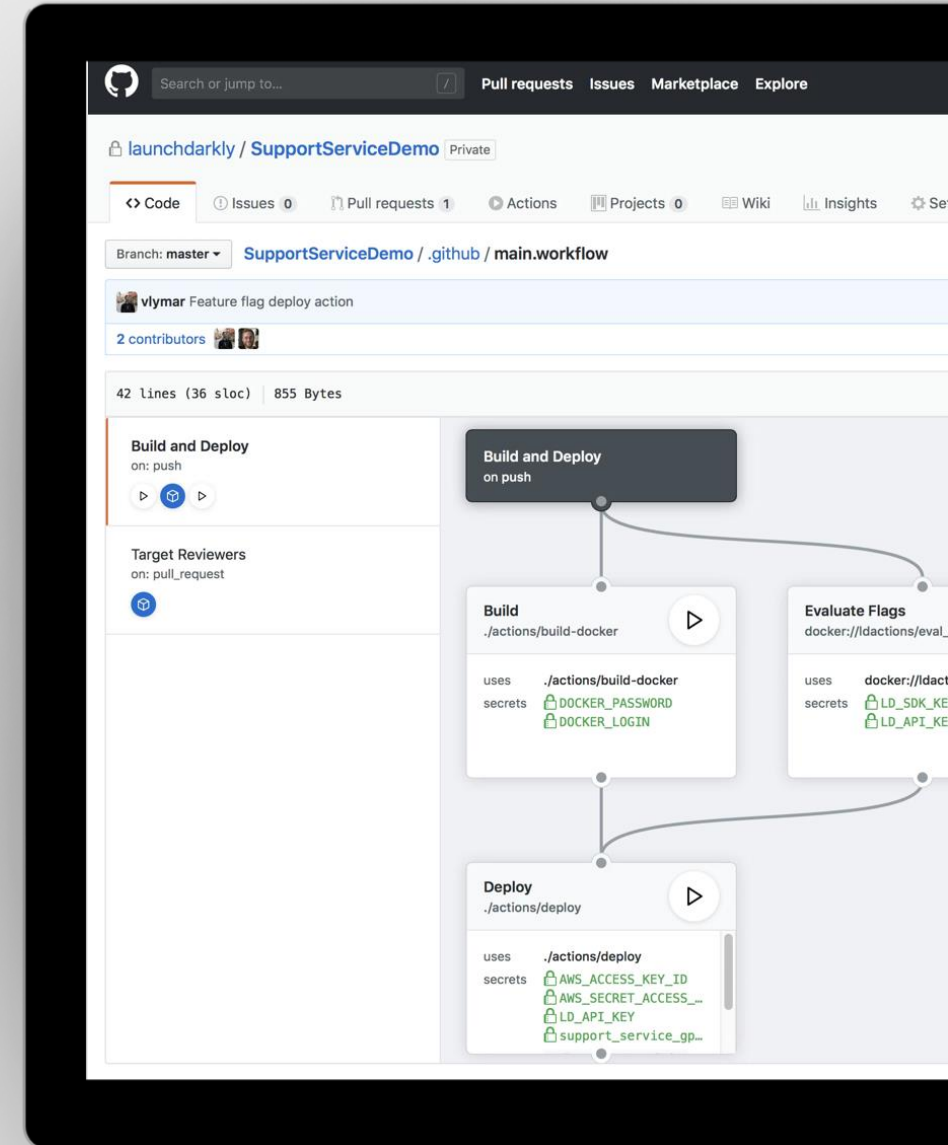
Simple and easy to use

Configuration based on YAML with a host of sample workflows to learn from and get started



Global community for actions

Thousands of open source Actions, maintained by the community and by companies offering integrations, including Microsoft Azure





Automate your workflow from idea to production

Getting started with GitHub Actions

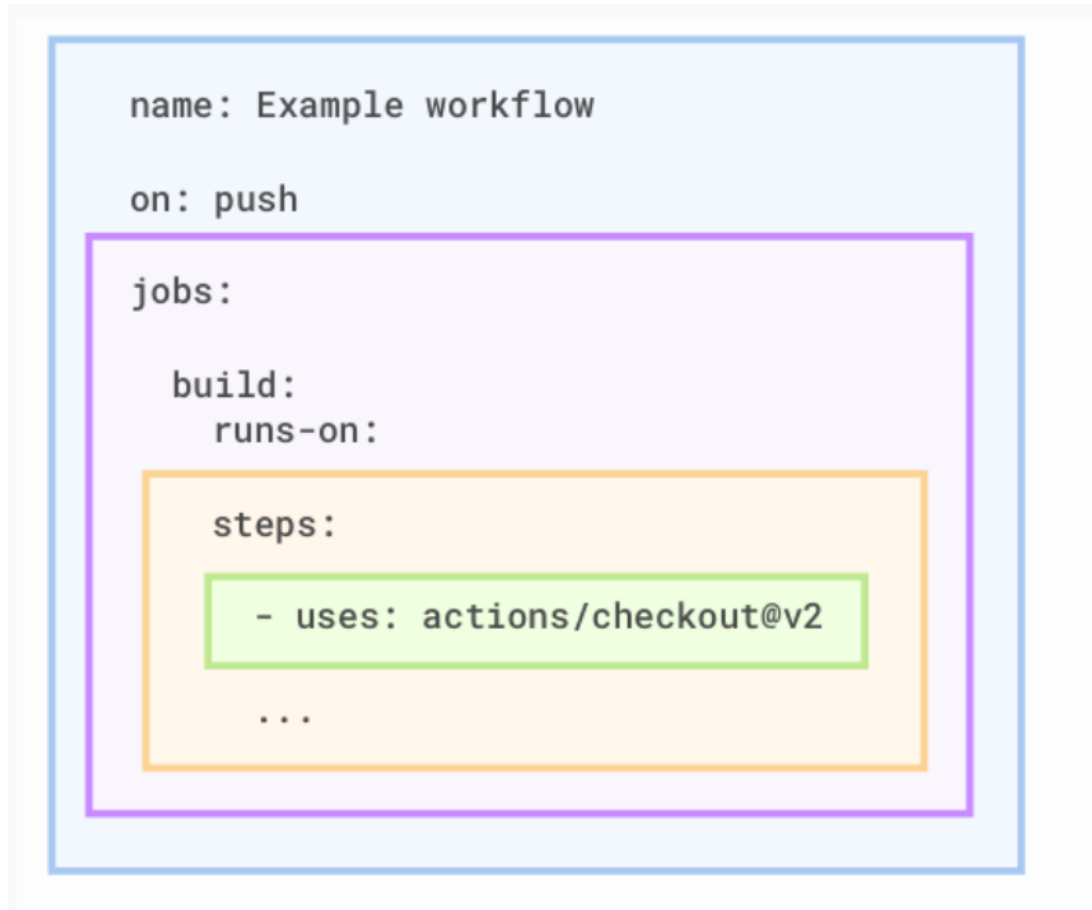
Workflow

-> YAML file stored in the `.github/workflows`

Action

-> Marketplace or write your own

Getting started with GitHub Actions



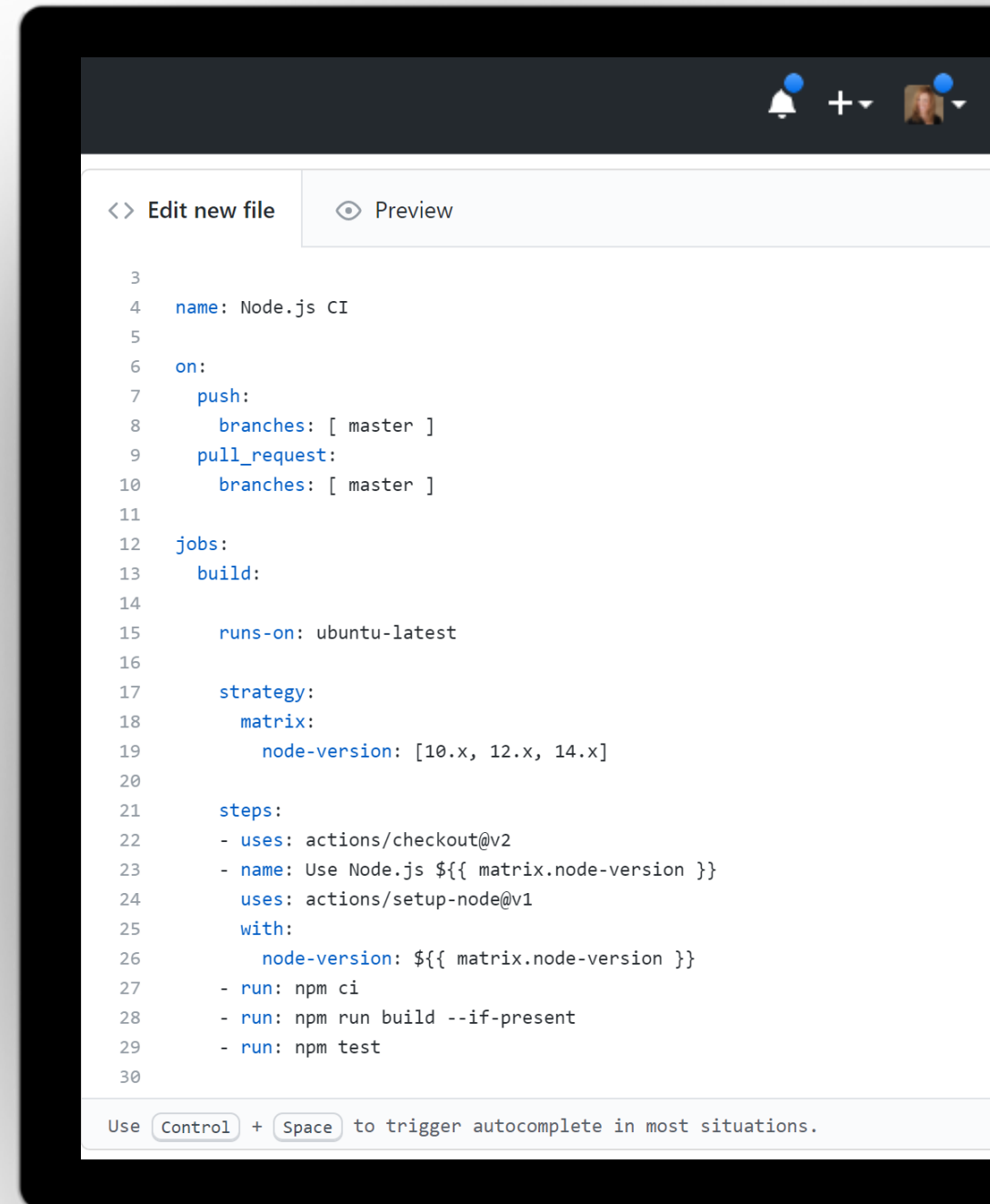
- **Workflow:** unit of automation from start to finish, including triggers, environment or aspects to be considered during the automation
- **Job:** a section of the workflow and is made up of one or more steps.
- **Step:** A step represents one effect of the automation, could be a GitHub Action, or another unit, like printing something to the console.
- **Action:** a piece of automation written in a way that is compatible with workflows.

GitHub Standard Actions

The power of GitHub Actions lies in the community. Here are two Actions officially written and supported by GitHub:

- **actions/checkout@v2** ensures the runner has a copy of the codebase.
- **actions/setup-node@v1** is used to set up proper versions of Node.js
- **actions/upload-artifacts**: uploads artifacts from your workflow allowing you to share data between jobs and store data once a workflow is complete.

In addition to running pre-built actions, the workflow can also execute commands, just as you would if you had direct access to the runner.



Workflow status

Last run

Workflow / Check suite

Job / Check run

Step

Download logs / More options

Run time

Log view

octocat / hello-world-workflow Private

Code Issues 0 Pull requests 2 Actions Projects 0 Wiki Security Insights

Update main.yml
set-up-actions c76a964

Hello world workflow
on: push

A job run on Linux

A job run in a container

GitHub Actions / A job run on Linux successful 16 hours ago in 5s

Search logs

Set up job 2s

Run actions/checkout@master 2s

Hello world action step 1s

```
1 ▼ Run ./github/actions/javascript-action
2   with:
3     who-to-greet: Mona the Octocat
4     ##[debug]Hello Mona the Octocat!
5     ##[set-output name=time;]01:38:44 GMT+0000 (Coordinated Universal Time)
```

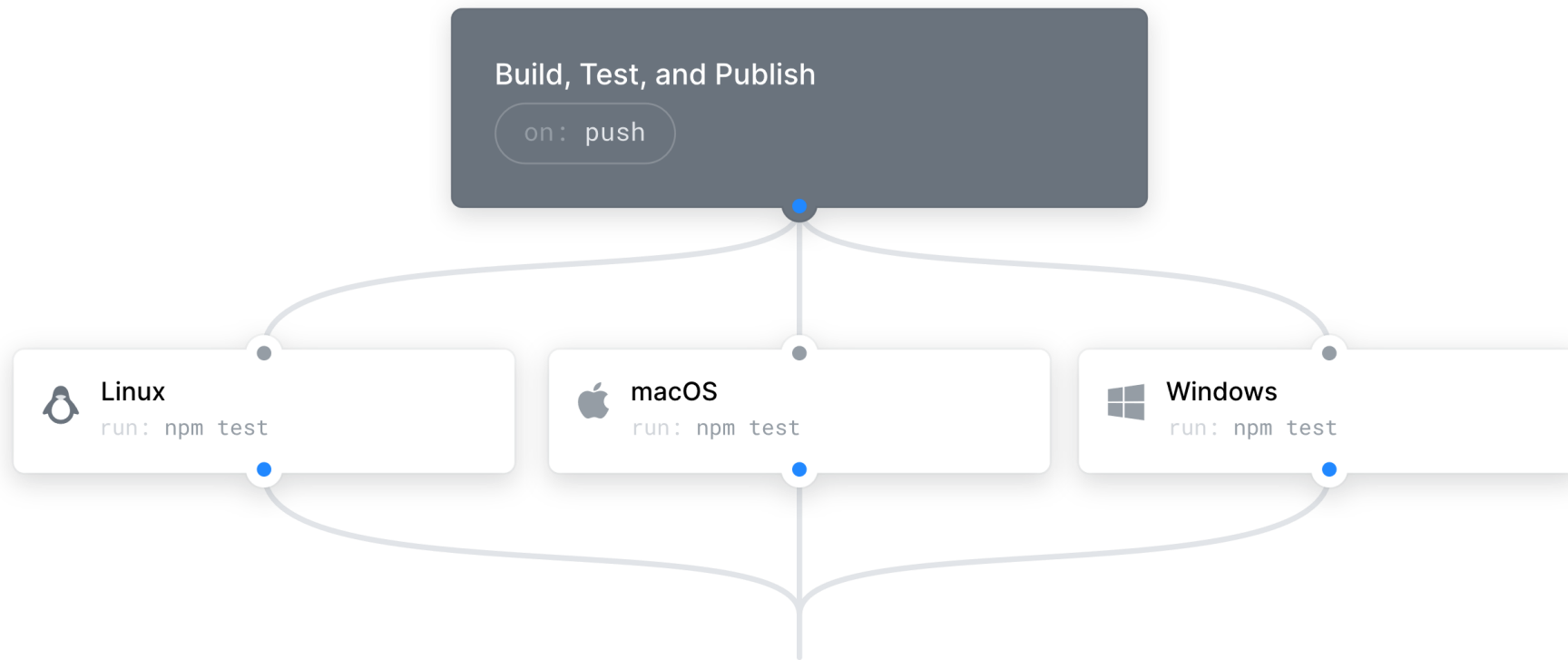
Get the output time 0s

```
1 ▼ Run echo "The time was 01:38:44 GMT+0000 (Coordinated Universal Time)"
2   echo "The time was 01:38:44 GMT+0000 (Coordinated Universal Time)"
3   shell: /bin/bash -e {0}
4   The time was 01:38:44 GMT+0000 (Coordinated Universal Time)
```

Complete job 0s



Run a workflow on any GitHub event



Linux, macOS,
Windows,
containers



Matrix Builds




Any Language

Live logs

Built in secret store


Multi-container testing




All checks have passed


4 successful checks


[Hide all checks](#)




 build


Successfully in 59s — build




 test

Successfully in 59s — build



 publish

Successfully in 59s — build



This branch has no conflicts with the base branch

Merging can be performed automatically.

Merge pull request

▼

You can also [open this in GitHub Desktop](#) or view [command line instructions](#).

Secure, scalable enterprise workflow automation

End-to-end traceability + governance

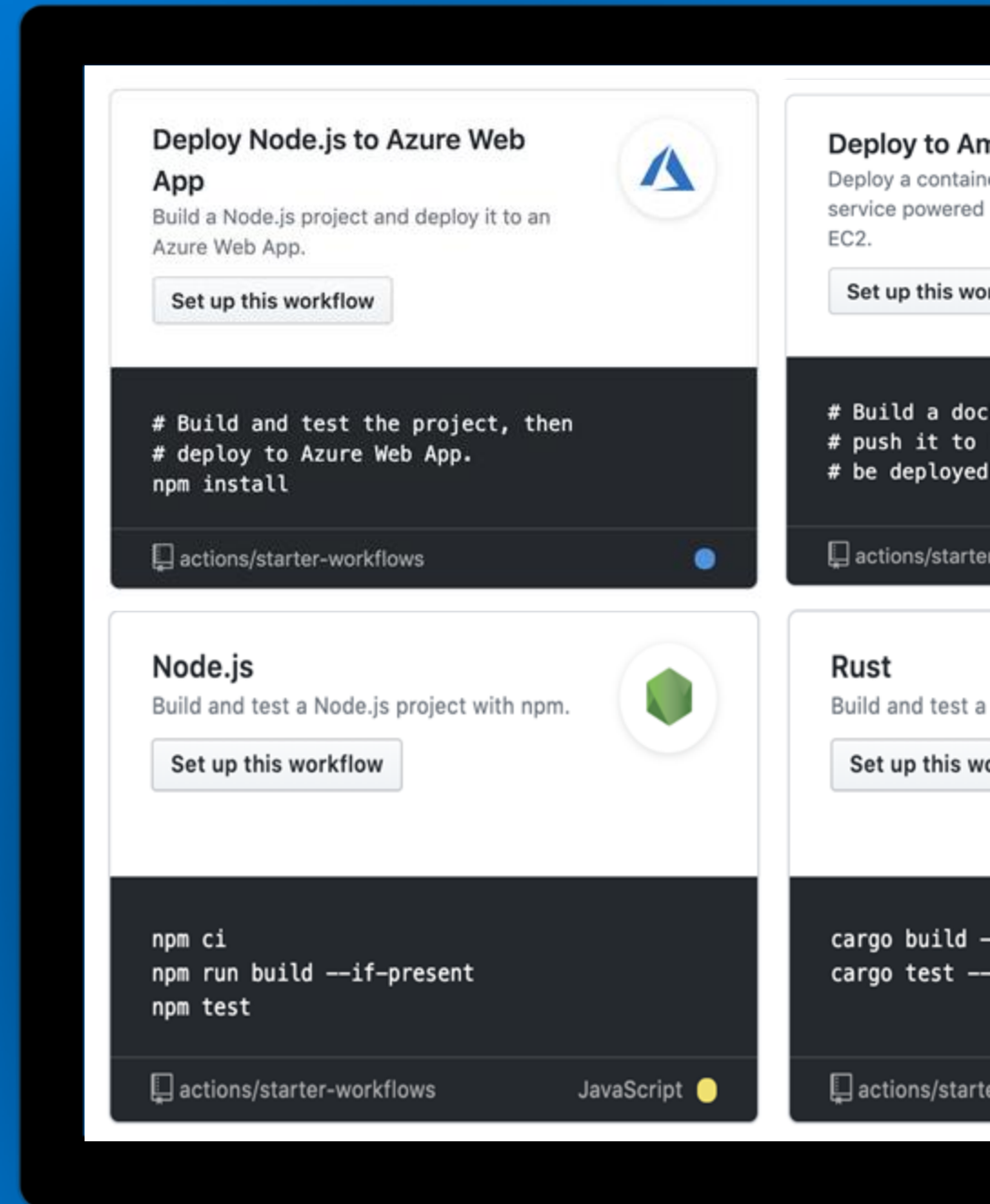
Plan and track work in Azure Boards linked to GitHub, and monitor your code deployed to Azure from GitHub Actions

Scale best practices with code

Define and scale processes, security, and compliance policies for your organization, across teams, repos, and throughout the software lifecycle

Unified authentication

Sign into Azure with your GitHub credentials and authenticate to GitHub Enterprise with Azure AD



Community standard for code-to-cloud

The largest DevOps ecosystem on earth

2,500+ Actions available in GitHub Marketplace, a 5x increase since August 2019 and growing every day

Leading cloud partners for automation

Container, Kubernetes, and serverless deployments for Microsoft Azure and other clouds. Automate infrastructure as code with HashiCorp.













Seamlessly bring community standards into your development

Industry standard package formats for .NET, JavaScript, Ruby, Java, and Docker containers

Actions

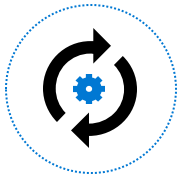
An entirely new way to automate your development workflow.

2587 results filtered by Actions x

- | | |
|---|---|
|  Test Action
By drudzkatlassian
Test Action
3 stars |  GitHub Action for Filtering on Event Payloads
By dschep
Run JavaScript expressions against the parsed contents of the file at GITHUB_EVENT_PATH
5 stars |
|  Jenkinsfile Runner Prepackaged
By jenkinsci
Runs Jenkinsfile in a pre-packaged single-shot master
113 stars |  Hecate Dispatch
By hecateapp
Sends emails to stakeholders when pull requests are merged
18 stars |
|  Haskell Linter
By domdere
Run hint on your haskell code base
12 stars |  Debug Action
By hmarr
Log the action's environment variables and event payload
24 stars |
|  php-ga.composer-require-checker
By php-ga
composer-require-checker
3 stars |  Update Article Information
By uribo
Add reference information as comment and modified a issue title
5 stars |
|  Repository Visibility SMS Alert
By bitoiu
Notifies active organization owners that a repository has been made public and allows them to react via SMS
8 stars |  Figma Action
By primer
Export image assets from figma to GitHub
91 stars |
|  Trigger GitLab CI
By appleboy
Triggering GitLab CI pipelines through |  Trigger Jenkins Job
By appleboy
Triggering Jenkins Job through the API |

GitHub loves Azure

Provide a seamless cloud experience for GitHub



Automated workflows with Azure

GitHub Actions for Azure has native support for deployments to Azure Kubernetes Service, Azure Web Apps, Azure Container Registry, and more planned



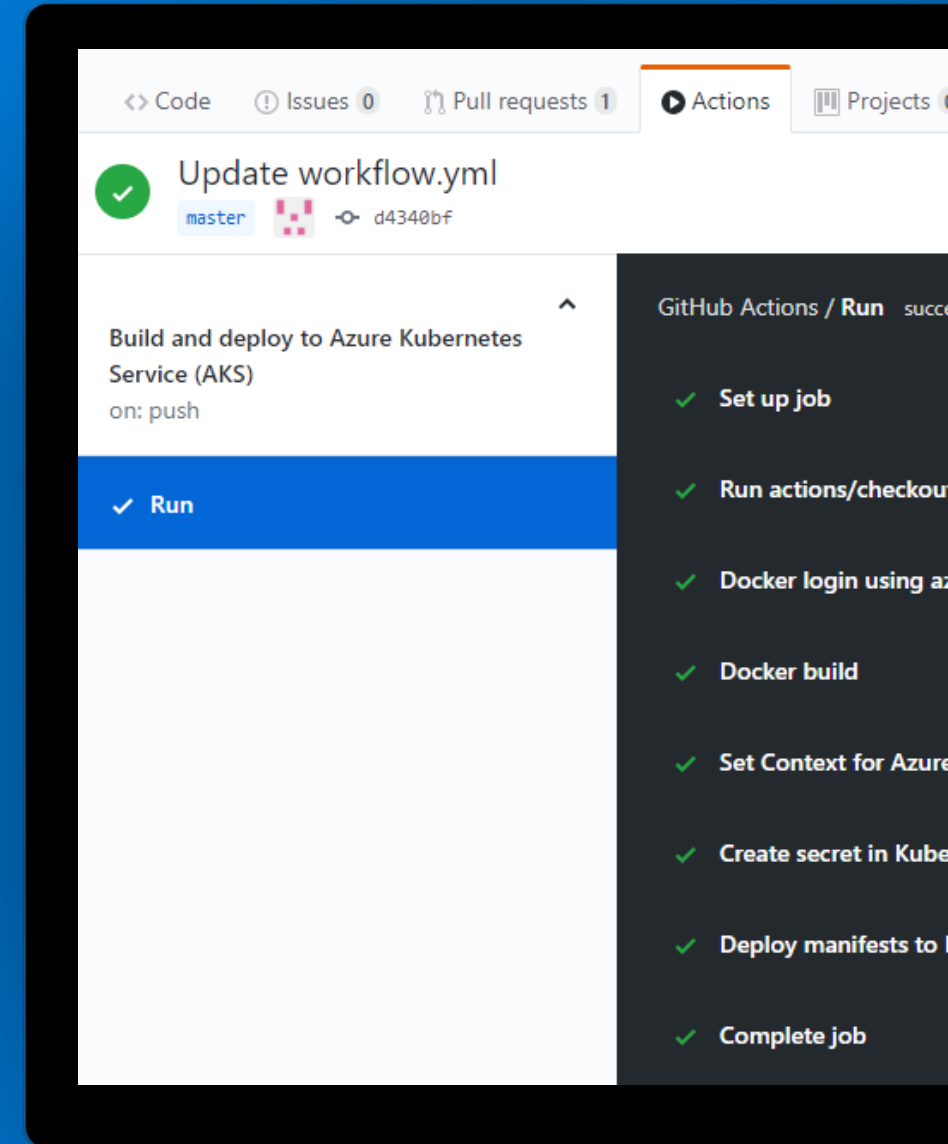
End-to-end traceability and governance

Plan and track work in Azure Boards linked to GitHub, and monitor your code deployed to Azure from GitHub Actions



Unified authentication

Sign into Azure with your GitHub credentials and authenticate to GitHub Enterprise with Azure AD



Codespaces

Your instant dev environment

Code without compromise

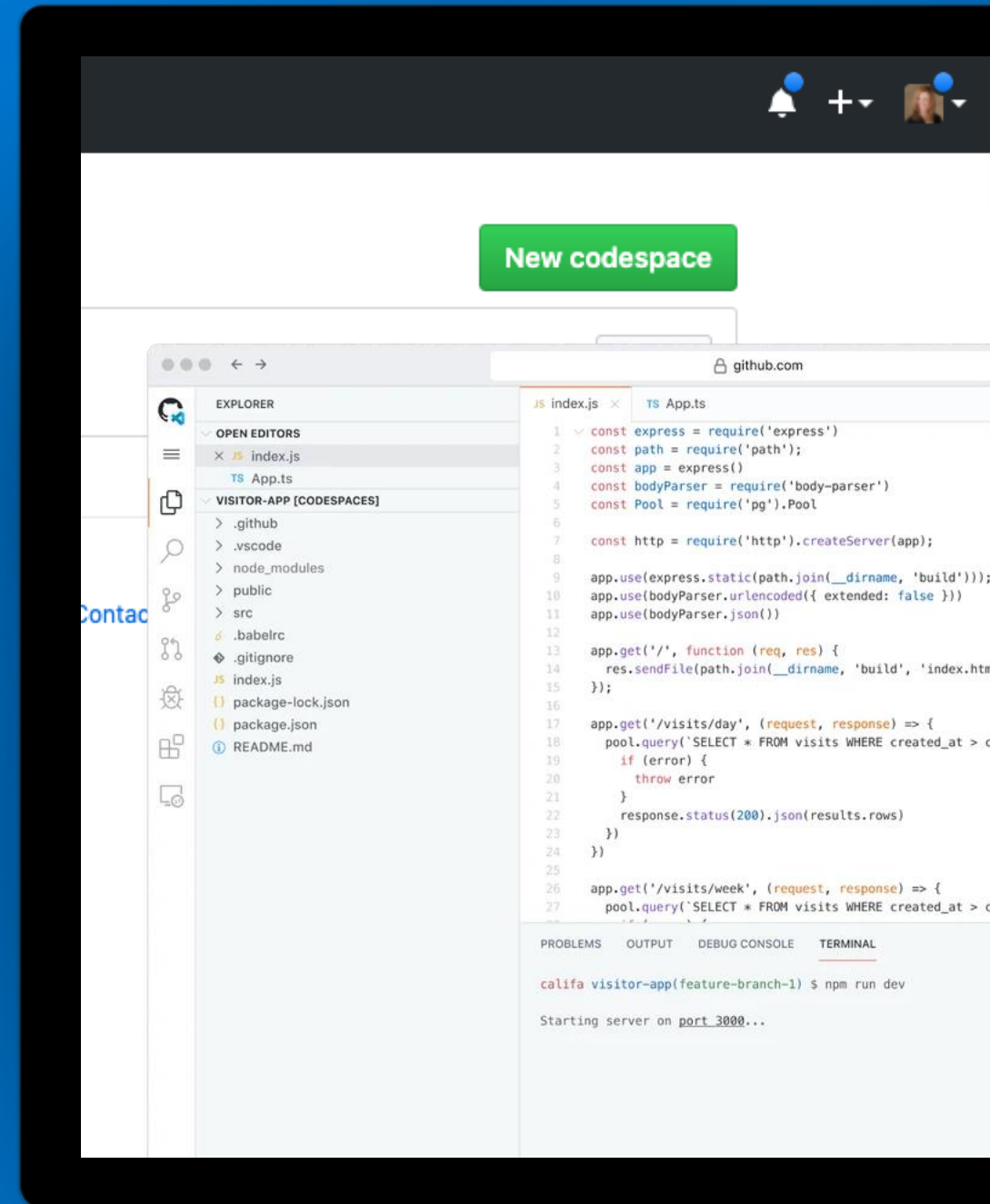
Code, build, test, debug, and deploy with a complete development environment in your browser.

Simplify your workflow

Automatically set up dependencies and SSH keys.
Go from code to commit faster on any project.

Extend and customize

Configure your editor with dotfiles and VS Code extensions to create a consistent environment in every codespace.



Insights

Development metrics that matter

Get research-backed guidance

Make sure what you're measuring is making a difference with actionable, helpful, and impactful KPIs validated by the GitHub community

See progress in real-time

Visualize current activity, get up-to-date snapshots, and understand how your team collaborates as quickly as the work happens.

Ship faster through better process

Measure every step of your development process so teams can make decisions that shorten cycles and speed time to market.

