



# CI/CD With GitHub Actions

## Workshop



## Muthukumaran Kasiviswanathan

Muthukumaran Kasiviswanathan has 20+ years of industry experience and has specifically been involved in the developer space and DevOps for a decade. He is currently a part of GitHub working on Actions and other code to cloud solutions. Before GitHub he was at Microsoft for 12 years in developer division.

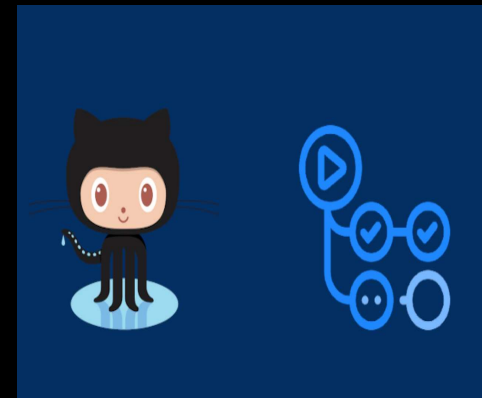


## Kanchan Verma

Kanchan is a Senior Software Manager at GitHub. She is working on GitHub Actions and previously worked on building Azure Wiki, Repos, Boards and ChatOps for AzureDevOps at Microsoft. She is passionate about building performant user experiences and believes in 'Together, We Can'.

# Workshop Outcomes

- Understand concepts related to Workflow, Actions and Packages
- Learn how to Automate your CI workflows
- Learn how to Automate your CD workflows deploying to dev-test and production environments
- Learn how to publish to GitHub packages
- Understand concepts related to Action Authoring and Third-party Actions



# Schedule

- Intro: 5 minutes
- About GitHub Actions and Packages: 5 minutes
- Hands-on workshop setup and goals: 5 minutes
- Exercise 1 - Building CI workflow : 15 minutes
  - Recap of learnings from Exercise 1 : 5 minutes
- Exercise 2 – Building CD workflow : 20 minutes
  - Recap of learnings from Exercise 2 : 5 minutes
- Exercise 3 – Publishing to GitHub packages : 10 minutes
  - Recap of learnings from Exercise 3 : 5 minutes
- About building custom Actions and Marketplace : 5 minutes
- Q & A: 10 minutes



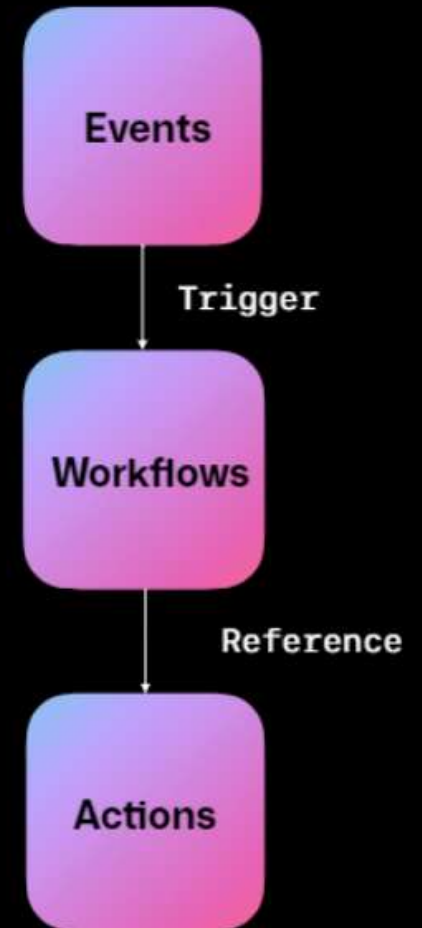
# What are GitHub Actions?



## GitHub Actions



<https://youtu.be/cP0I9w2coGU>



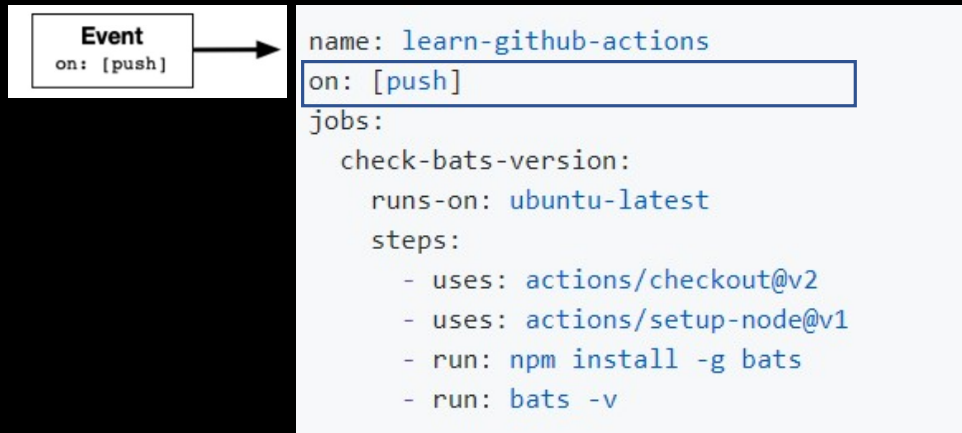
# Workflows

- Automated Procedures that is added in your repository
- .yml files
- Located in .github/workflows/ directory.

.github/workflows/learn-github-actions.yml

```
name: learn-github-actions
on: [push]
jobs:
  check-bats-version:
    runs-on: ubuntu-latest
    steps:
      - uses: actions/checkout@v2
      - uses: actions/setup-node@v1
      - run: npm install -g bats
      - run: bats -v
```

# Events



## Webhook Events

```
on:
  pull_request:
    types: [assigned, opened, synchronize, reopened]
```

## Scheduled Events

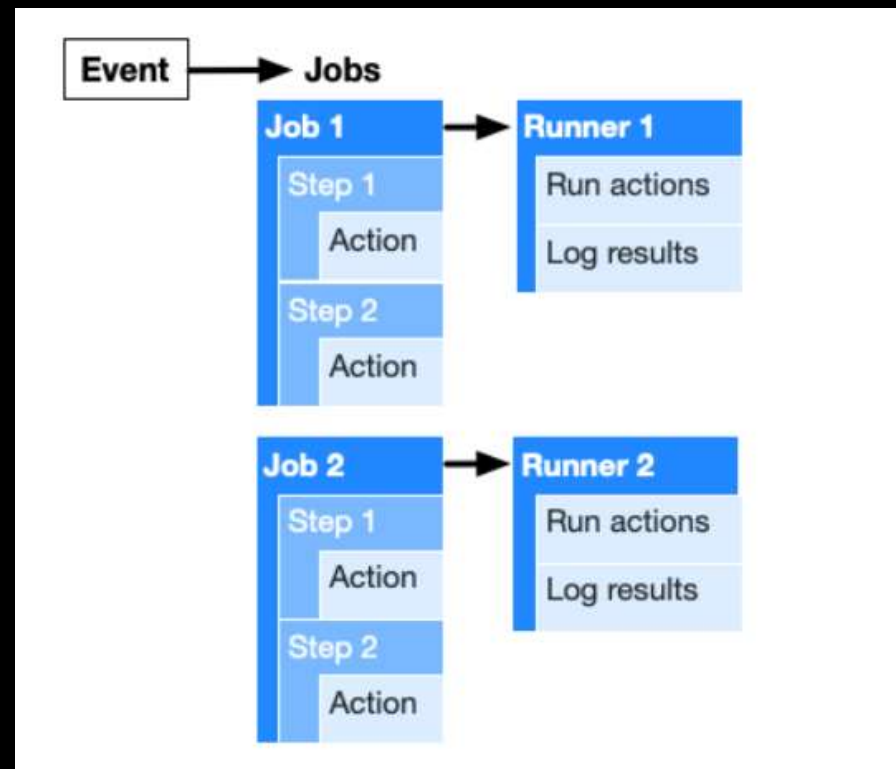
```
on:
  schedule:
    # * is a special character in YAML so you have to quote this string
    - cron: '*/*15 * * * *'
```

## Manual Events

```
on: workflow_dispatch
```

# Jobs

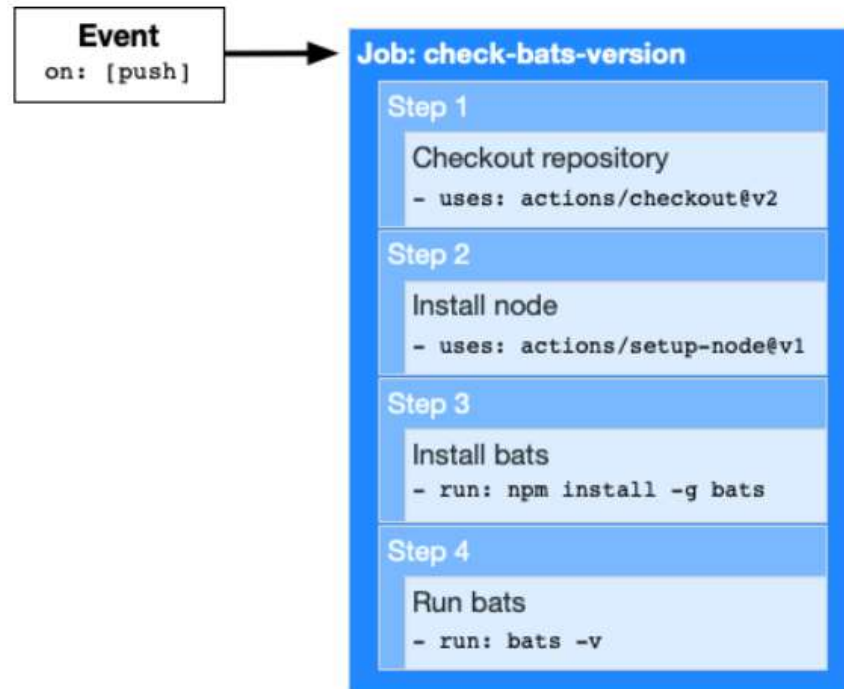
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    runs-on: ubuntu-latest
    steps:
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      - run: npm install -g bats
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# Steps

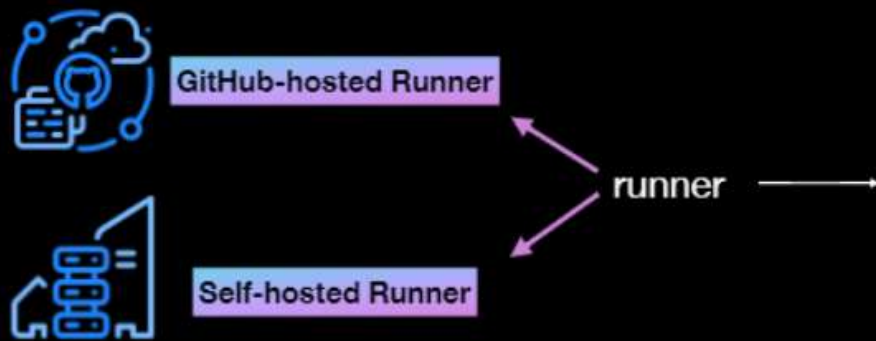
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```



# Actions

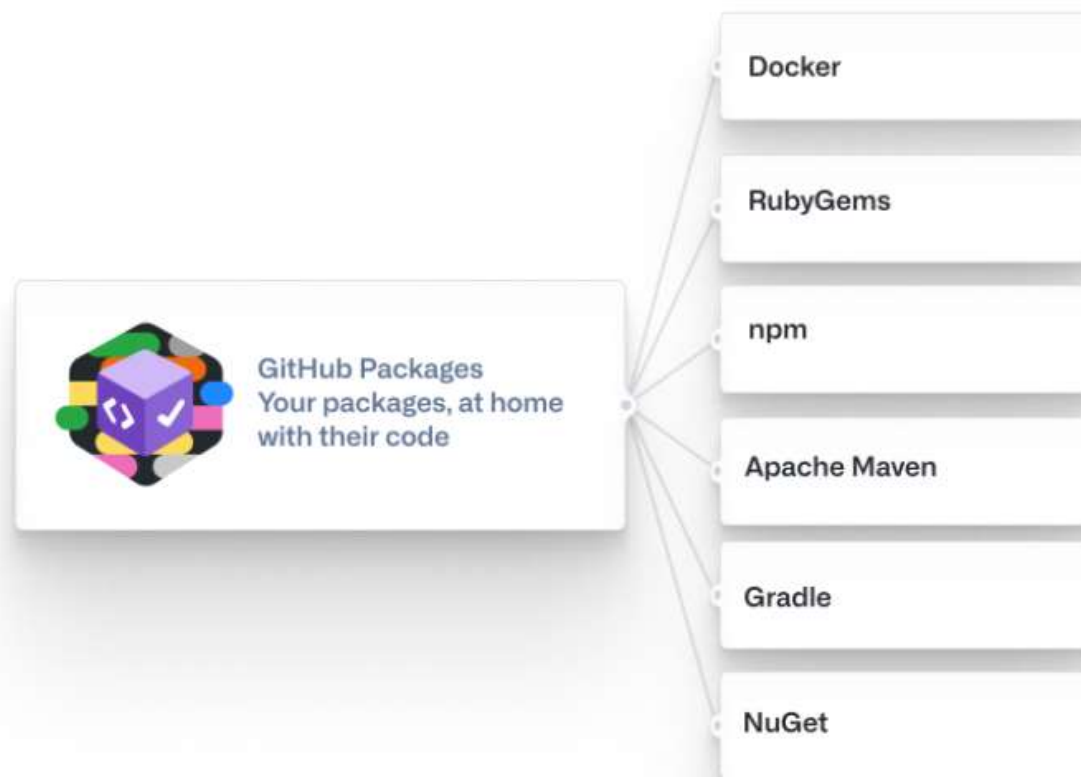
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jobs:
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    steps:
      - uses: actions/checkout@v2
      - uses: actions/setup-node@v1
      - run: npm install -g bats
      - run: bats -v
```

# Runners



```
name: learn-github-actions
on: [push]
jobs:
  check-bats-version:
    runs-on: ubuntu-latest
    steps:
      - uses: actions/checkout@v2
      - uses: actions/setup-node@v1
      - run: npm install -g bats
      - run: bats -v
```

# GitHub Packages



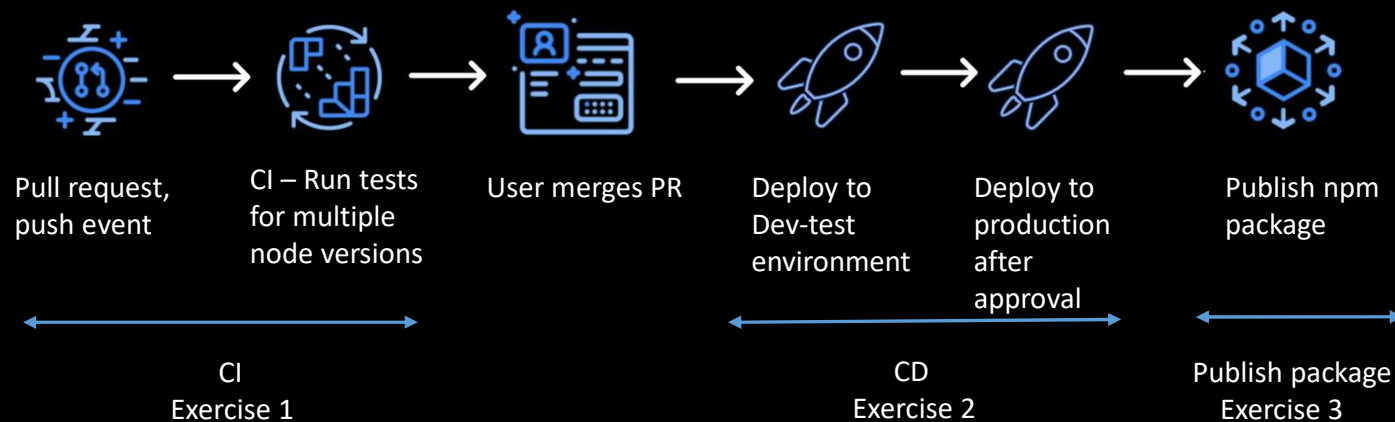


 **Hands-on** 

# Setup - Automate our software workflow

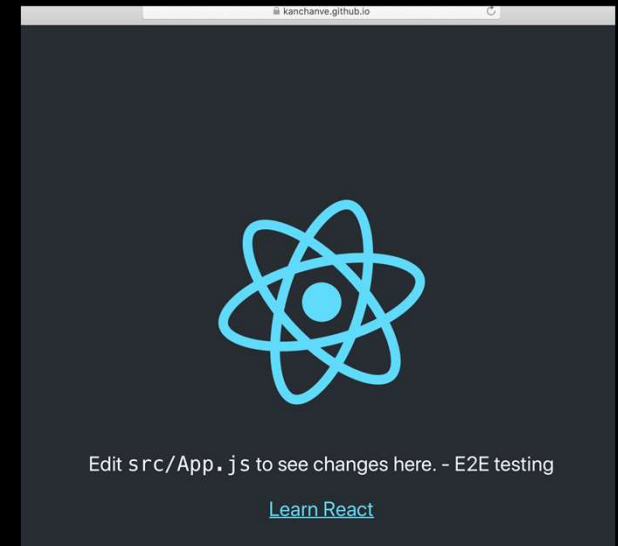


# Goal for the hands-on activity



# An app ready to use for hands-on activity

- A new single page application using a React starter
  - [create-a-new-react-app.html](https://kanchanve.github.io/create-a-new-react-app.html)
- Ready to use code in src/ and prebuilt package.json
- Contains only a frontend build pipeline
  - 'npm run build'
  - Creates an optimized build of your app in the 'build' folder
  - This build folder can be deployed to a service of your choice







# **Hands-on**

Exercise 1 : Automate a CI workflow to build and test your changes as part of PRs and Check-ins.

# Exercise 1 - Instructions

- [ci-cd-with-actions/workshop\\_instructions1.md](https://github.com/satelliteworkshops/ci-cd-with-actions/blob/main/ci-cd-with-actions/workshop_instructions1.md) at main · [githubsatelliteworkshops/ci-cd-with-actions](https://github.com/satelliteworkshops/ci-cd-with-actions)
- Time allotted – 15 minutes

# Recap – Learnings from Exercise 1

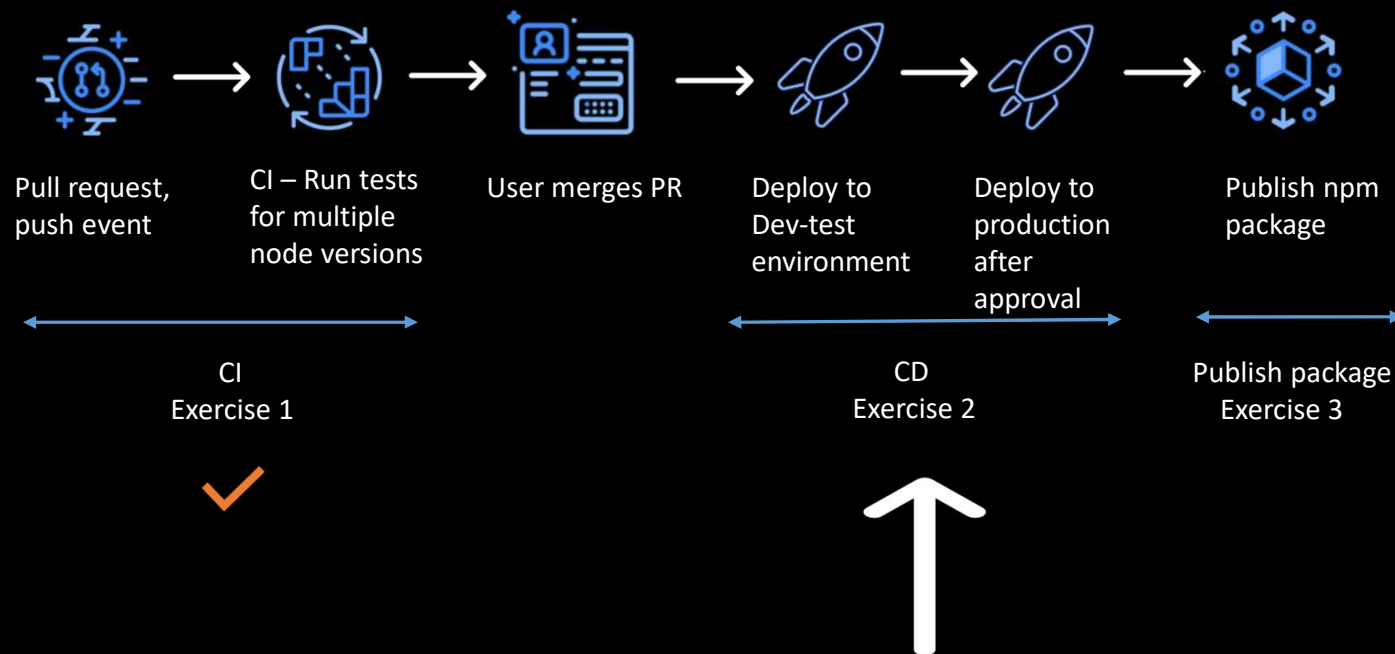
1. How to create a new CI workflow?
2. About Workflow templates
3. Action Workflow authoring using GitHub UI
4. Configuring Action triggers and type of triggers
5. About Job strategies
6. Adding status badge for a run



## **Hands-on**

Exercise 2 : Build CD with GitHub Actions that deploys to test and production environments

# Goal for the hands-on activity



# Exercise 2 - Instructions

- Exercise 2 setup
  - Continuous deployment involves deploying to any hosted or on-premise production computes automatically.
  - We will be using GitHub Pages hosted in two repos to illustrate the CD concepts.
  - One of the repo will host a Dev-Test instance of the app and the other will host the Production instance and will be protected by approvals.
  - These steps and Actions can be replaced with steps and Actions targeting any hosted or on-premise computes.
- [ci-cd-with-actions/workshop\\_instructions2.md at main · githubsatelliteworkshops/ci-cd-with-actions](https://github.com/satelliteworkshops/ci-cd-with-actions/blob/main/ci-cd-with-actions/workshop_instructions2.md)
- Time allotted – 20 minutes

# Recap – Learnings from Exercise 2

1. Environments
2. Environment Approvals
3. Secret Variables
4. Using actions built by community from Marketplace
5. Custom Env Variables and their scopes

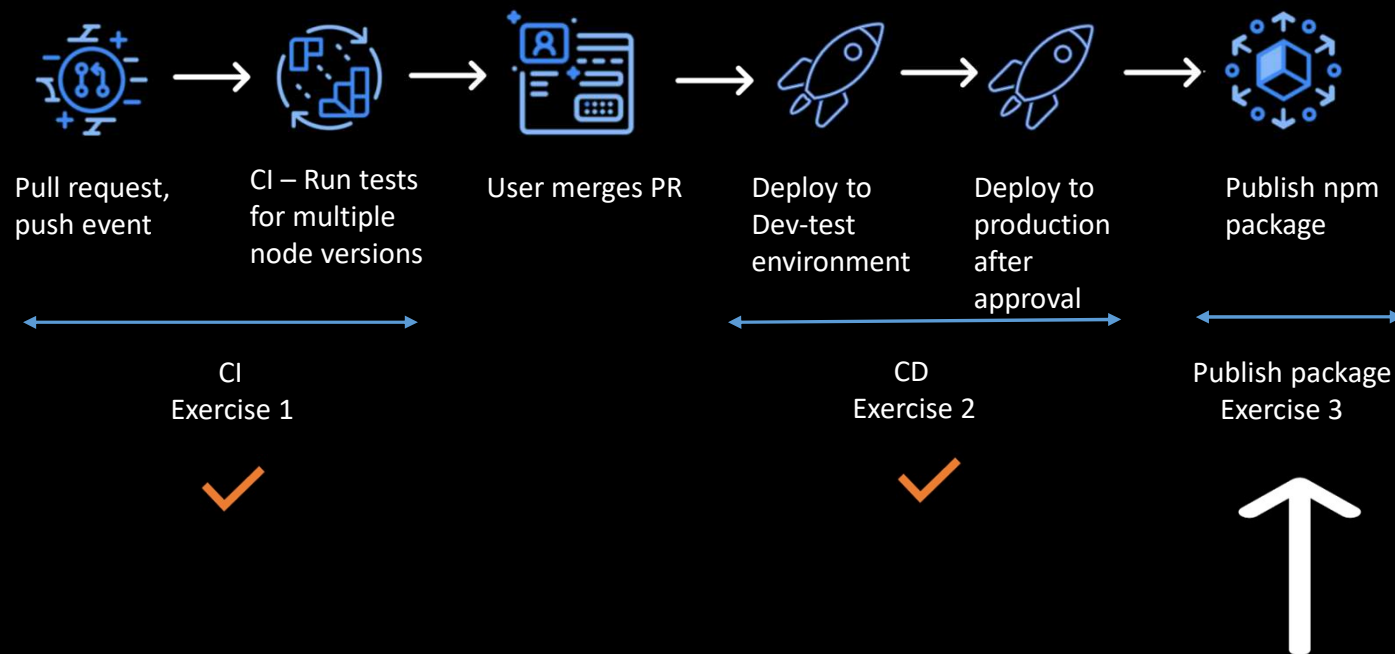


# **Hands-on**

Exercise 3 : Build a workflow to publish npm package to GitHub Packages



# Goal for the hands-on activity



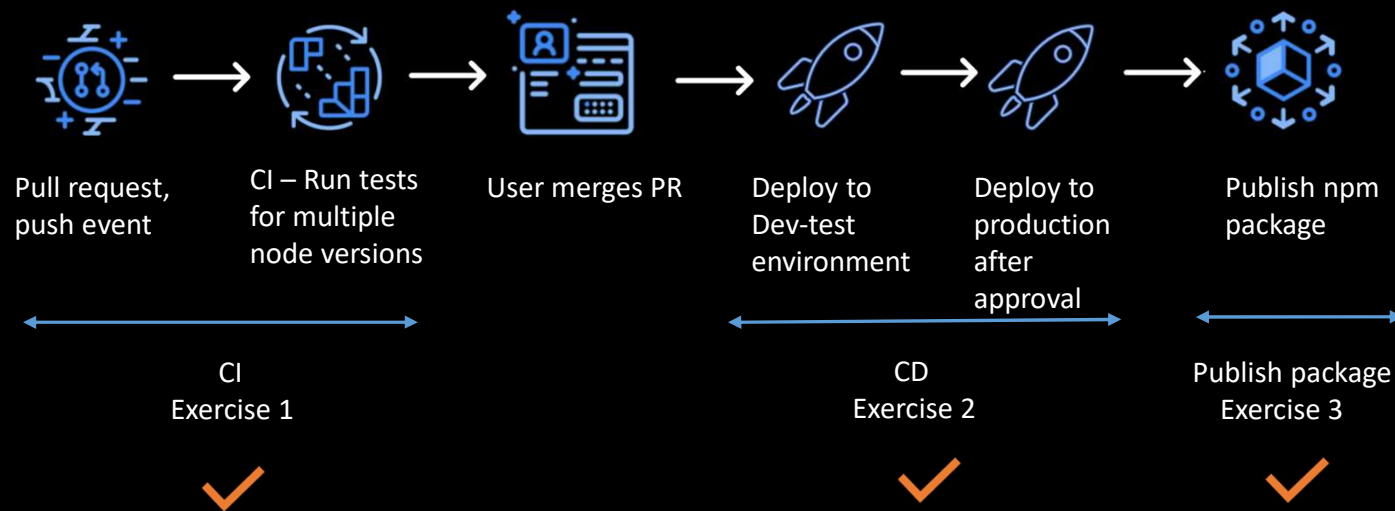
# Exercise 3 - Instructions

- [ci-cd-with-actions/workshop\\_instructions3.md at main · githubsatelliteworkshops/ci-cd-with-actions](https://github.com/satelliteworkshops/ci-cd-with-actions/blob/main/ci-cd-with-actions/workshop_instructions3.md)
- Time allotted – 10 minutes

# Recap – Learnings from Exercise 3

1. Publish package to GitHub
2. Default env variables
3. Manual triggers (e.g. workflow\_dispatch)

# Goal for the hands-on activity



# Authoring Custom Actions

[Creating actions - GitHub Docs](#)

action.yml

```
name: "Hello Actions"
description: "Greet someone"
author: "octocat@github.com"

inputs:
  MY_NAME:
    description: "Who to greet"
    required: true
    default: "World"

runs:
  using: "docker"
  image: "Dockerfile"

branding:
  icon: "mic"
  color: "purple"
```

# Third Party Actions

The screenshot displays the GitHub Marketplace interface for Actions. On the left, a sidebar lists 'Types' (Apps, Actions) and 'Categories' (API management, Chat, Code quality, Code review, Continuous integration, Dependency management, Deployment). The 'Actions' tab is selected. A search bar at the top right contains the text 'Search for apps and actions'. Below the search bar, the 'Actions' section is titled 'Actions' with the description 'An entirely new way to automate your development workflow.' and shows '7646 results filtered by Actions'. The main area displays a grid of action cards. Each card includes an icon, the action name, the creator, a description, and the number of stars.

| Action Name                       | By                | Description   | Stars    |
|-----------------------------------|-------------------|---|----------|
| StackPulse Apply Playbook         | By stackpulse     | Apply automatic Incident Response playbooks with StackPulse           | 19 stars |
| Docker Buildx Bake                | By docker         | GitHub Action to use Docker Buildx Bake as a high-level build command | 12 stars |
| Push To Registry                  | By redhat-actions | Push a container image to an image registry                           | 26 stars |
| Glo Add Label To Cards            | By Axosoft        | GitHub action to add a label to Glo Boards cards                      | 2 stars  |
| Setup Ruby, JRuby and TruffleRuby |                   |   |          |
| Docker Setup Buildx               |                   |   |          |

[GitHub Marketplace · Actions to improve your workflow](#)

# Further Reference

- Documentations
  - [GitHub Actions Documentation - GitHub Docs](#)
  - [Publishing actions in GitHub Marketplace - GitHub Docs](#)
  - [About GitHub Packages - GitHub Docs](#)
- Action Repos
  - [Azure/actions: Automate your GitHub workflows using Azure Actions](#)
  - [AWS for GitHub Actions](#)
  - [google-github-actions](#)
  - [hashicorp/terraform-github-actions: Terraform GitHub Actions](#)
  - [actions/starter-workflows: Accelerating new GitHub Actions workflows](#)
- RoadMap
  - [github/roadmap: GitHub public roadmap](#)

Q & A