



# GitHub Actions 101

*Justin Yoo*





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# Hello

## Senior Cloud Advocate



# Hello

Justin Yoo  
Senior Cloud Advocate

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# What We Will Cover

What Is GitHub Actions?

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GitHub Actions Core Concepts

Building GitHub Actions Workflow

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Building Custom GitHub Action

# What is GitHub Actions?



# Why CI/CD?

**Dev - Test - Deployment:  
Full automation**

# Why CI/CD?

**Fail-fast -  
speed of development**

# Why CI/CD?

**Transparency  
Visibility**

# What Is GitHub Actions?

## CI/CD Pipeline

# What Is GitHub Actions?

## Workflow Engine

# What Is GitHub Actions?

**Workflow Engine =  
Collection of Individual Actions**

# What Is GitHub Actions?

Fork of  
Azure DevOps Pipelines

OK, now I know...

**CI/CD & GitHub Actions**

**But why should I?**

# Why GitHub Actions?

**One Source Multi Use**

# Why GitHub Actions?

# Open Source

# Why GitHub Actions?

**Endless Potentials -  
Custom Actions**

# Why ***NOT*** GitHub Actions?

**Hosted Runners US Only**

# Why **NOT** GitHub Actions?

**Hosted Runners US Only -  
Data Traversing Issue**

# GitHub Actions Core Concepts



# GitHub Actions Core Concepts

Workflow

Event

Runner

Action

# GitHub Actions Core Concepts

**Workflow**

**Event**

**Runner**

**Action**

**Orchestration  
Engine**

# GitHub Actions Core Concepts

Workflow

Event

Runner

Action

Workflow Trigger

# GitHub Actions Core Concepts

Workflow

Event

Runner

Action

Build Agent –  
Azure VM

# GitHub Actions Core Concepts

Workflow

Event

Runner

Action

**GitHub-hosted**  
**Self-hosted**

# GitHub Actions Core Concepts

Workflow

Event

Runner

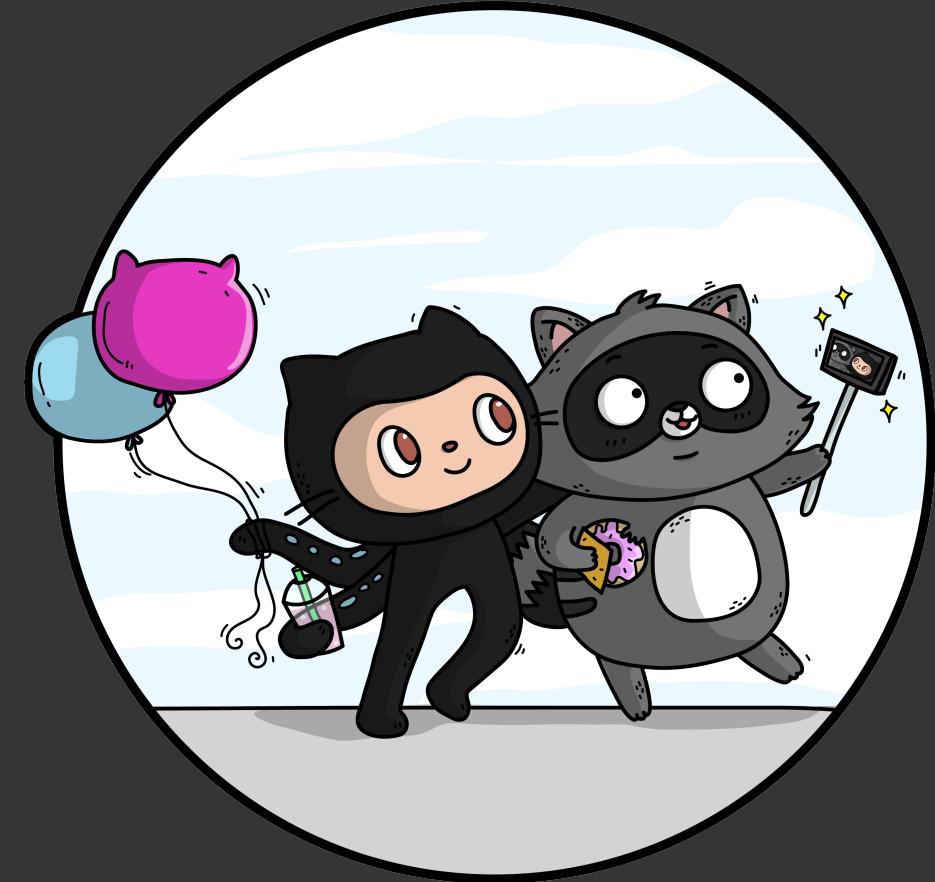
Action

Individual Task  
Declaration

# GitHub Actions Core Concepts

**[aka.ms/cb/core-concepts](https://aka.ms/cb/core-concepts)**

# Building GitHub Actions Workflow



# GitHub Actions Workflow Structure

```
name: <Workflow Name>
on: <Event>
jobs:
  <Job Name>:
    runs-on: <Runner Name>
    steps:
      - name: <Action Name>
        uses: <Action Reference>
```

# Building GitHub Actions Workflow

name: My First Workflow

# Building GitHub Actions Workflow

```
name: My First Workflow
```

```
on: push
```

# Building GitHub Actions Workflow

```
name: My First Workflow
```

```
on: push
```

```
jobs:
```

```
  build-and-deploy:
```

# Building GitHub Actions Workflow

```
name: My First Workflow
```

```
on: push
```

```
jobs:
```

```
  build-and-deploy:
```

```
    runs-on: ubuntu-latest
```

# Building GitHub Actions Workflow

```
name: My First Workflow
on: push

jobs:
  build-and-deploy:
    runs-on: ubuntu-latest

steps:
  - name: Checkout Repository
```

# Building GitHub Actions Workflow

```
name: My First Workflow
on: push

jobs:
  build-and-deploy:
    runs-on: ubuntu-latest

steps:
  - name: checkout Repository
    uses: actions/checkout@v1
```

# CAUTIONS!

**Store sensitive info to  
GitHub repo settings**

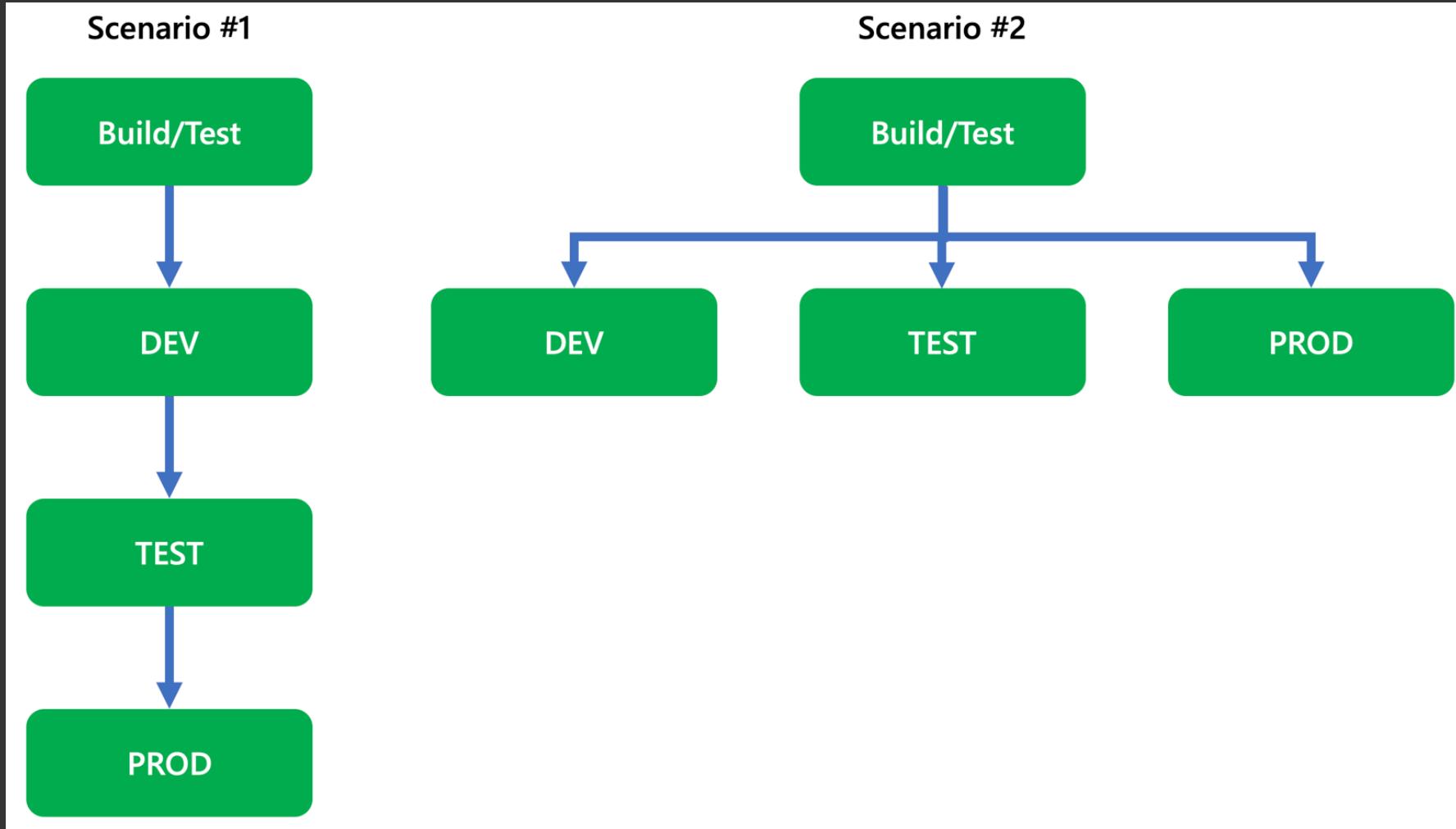
# CAUTIONS!

**Store sensitive info to  
Azure Key Vault or  
Amazon KMS**

# Workflow Sample

**aka.ms/cb/hol-actions**

# Deployment Scenarios



# Building GitHub Actions Workflow

jobs:

**build-and-test:**

  runs-on: ubuntu-latest

# Building GitHub Actions Workflow

jobs:

**build-and-test:**

  runs-on: ubuntu-latest

deploy-to-test:

**needs:** build-and-test

  runs-on: ubuntu-latest

# Building GitHub Actions Workflow

```
jobs:  
  build-and-test:  
    runs-on: ubuntu-latest  
  deploy-to-test:  
    needs: build-and-test  
    runs-on: ubuntu-latest  
  deploy-to-prod:  
    needs: deploy-to-test  
    runs-on: ubuntu-latest
```

# Building GitHub Actions Workflow

jobs:

**build-and-test:**

  runs-on: ubuntu-latest

**deploy-to-test:**

**needs:** build-and-test

  runs-on: ubuntu-latest

**deploy-to-prod:**

**needs:** build-and-test

  runs-on: ubuntu-latest

# CAUTIONS!

No data can be shared  
between jobs

# CAUTIONS!

No data can be shared  
between jobs -  
Use artifacts

# Workflow Sample

**[aka.ms/cb/ci-cd-actions](http://aka.ms/cb/ci-cd-actions)**

# Building Custom GitHub Actions



# Building Custom GitHub Actions

JS  
Docker

# Building Custom GitHub Actions

Runs on runner

JS

Docker

# Building Custom GitHub Actions

JS

Docker

Runs on runner  
Fast

# Building Custom GitHub Actions

JS

Docker

Runs on runner  
Fast  
node.js 12

# Building Custom GitHub Actions

JS

Docker

Runs outside

# Building Custom GitHub Actions

JS

Docker

Runs outside  
Slow

# Building Custom GitHub Actions

JS

Docker

Runs outside  
Slow  
Lang Agnostic

# Building Custom GitHub Actions

JS

Docker

Runs outside  
Slow  
Lang Agnostic  
Env Agnostic

# Building Custom GitHub Actions

**Private Custom Action –  
Stored repository**

# Building Custom GitHub Actions

**Public Custom Action -  
Marketplace**

# Custom Action Sample

**aka.ms/cb/custom-actions**

# What We Covered

What Is GitHub Actions?

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GitHub Actions Core Concepts

Building GitHub Actions Workflow

---

Building Custom GitHub Action

# To Be Continued...

## GitOps/ChatOps

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# Questions?



# THANK YOU!

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