

CI/CD - It's not just for DevOps!

Mandy Hubbard
@DevMandy

Mandy Hubbard

These are a few of my favorite (non-tech) things!

- Cats
- Astrology
- Crystals
- Creative writing
- Kundalini yoga
- Matcha!
- My kids (both of them)



@DevMandy

Let's talk about...

- What is CI/CD?
- What does the workflow look like?
- How do you implement it?
- Can we see a demo? (**Spoiler alert: YES!**)

CI = Continuous Integration

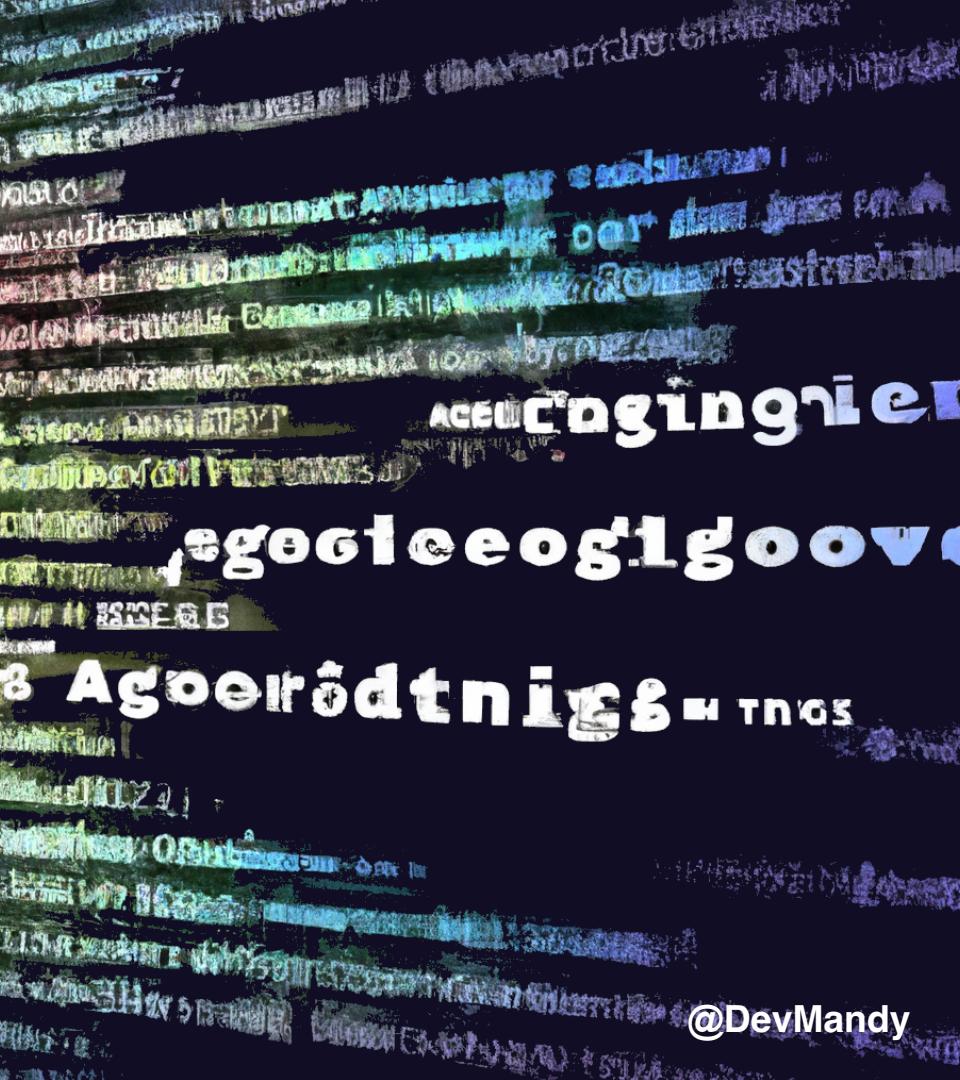
CI = Continuous Integration

CD = Continuous Delivery **OR**
Continuous Deployment

Continuous Integration

What is it?

A software development practice in which developers merge *small* code changes to a mainline branch very *frequently*, often multiple times per day

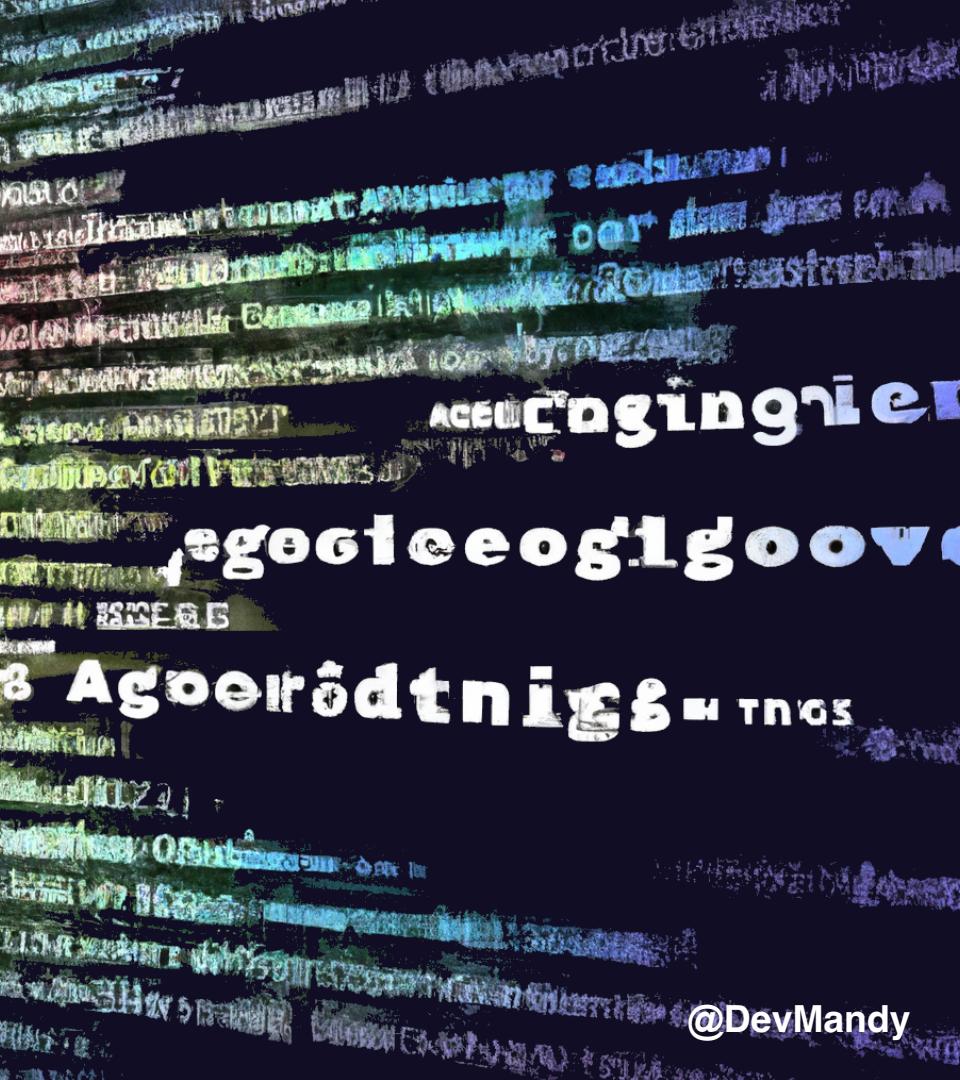


Continuous Integration

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A philosophy



Continuous Integration



Key Tenets



Continuous Integration

Key Tenets

- Small, frequent merges to a mainline branch



Continuous Integration

Key Tenets

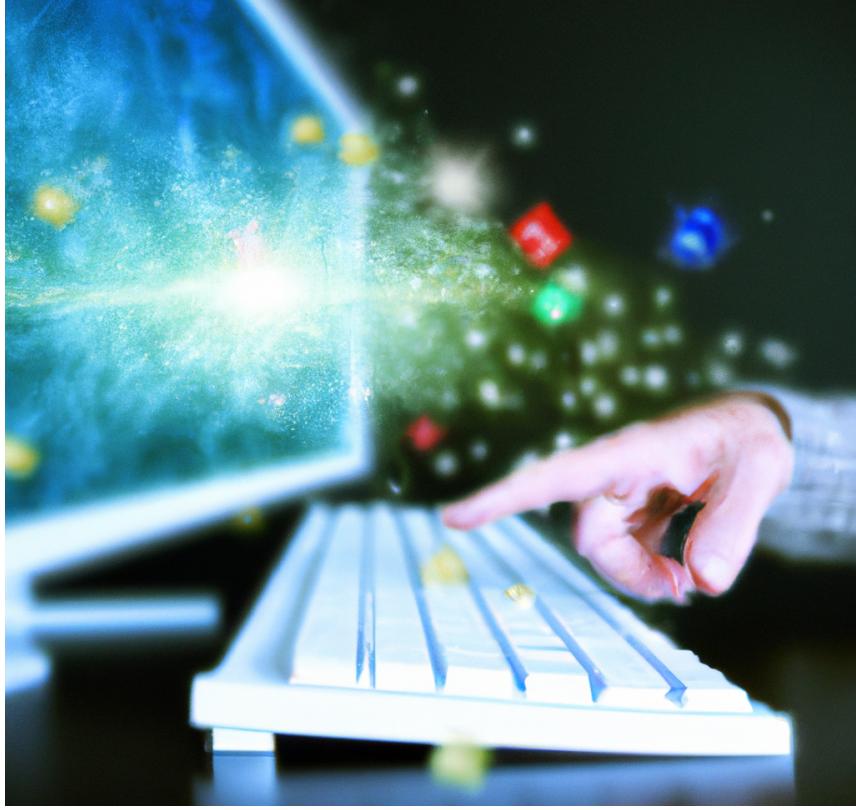
- Small, frequent merges to a mainline branch
- Automated tests (unit tests, static code analysis)



Continuous Integration

Key Tenets

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- Automated tests (unit tests, static code analysis)
- Pull requests



Continuous Integration

Key Tenets

- Small, frequent merges to a mainline branch
- Automated tests (unit tests, static code analysis)
- Pull requests
- Branch protection rules



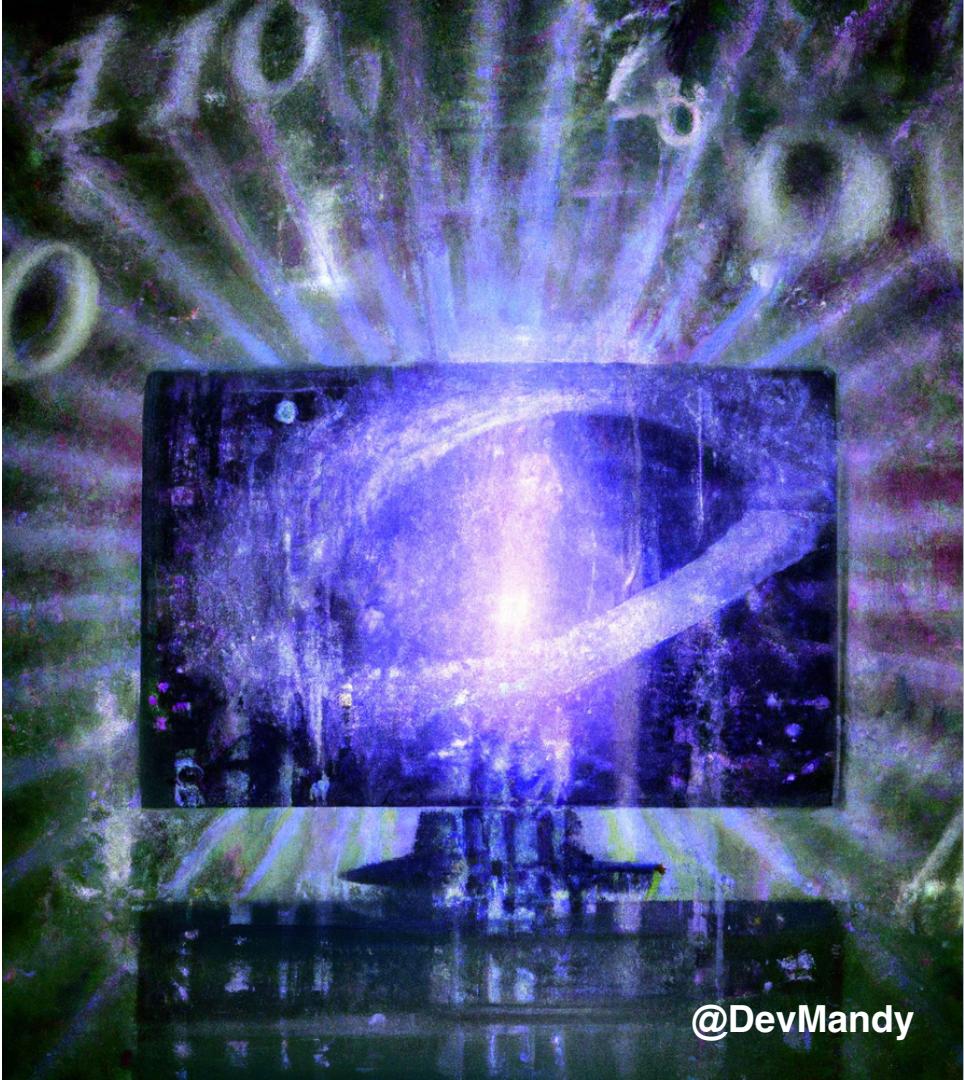
Continuous Integration

Key Tenets

- Small, frequent merges to a mainline branch
- Automated tests (unit tests, static code analysis)
- Pull requests
- Branch protection rules
- Quality checks

Continuous Integration

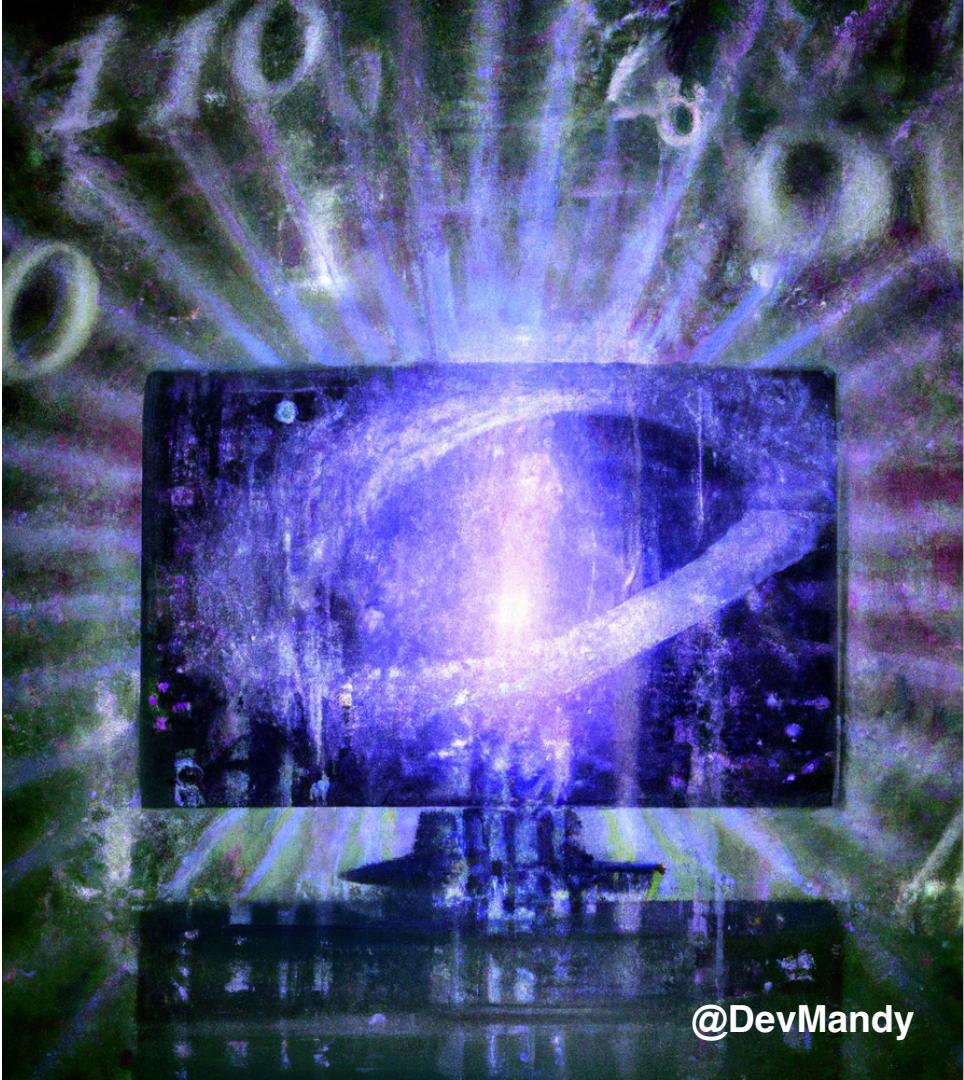
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Continuous Integration

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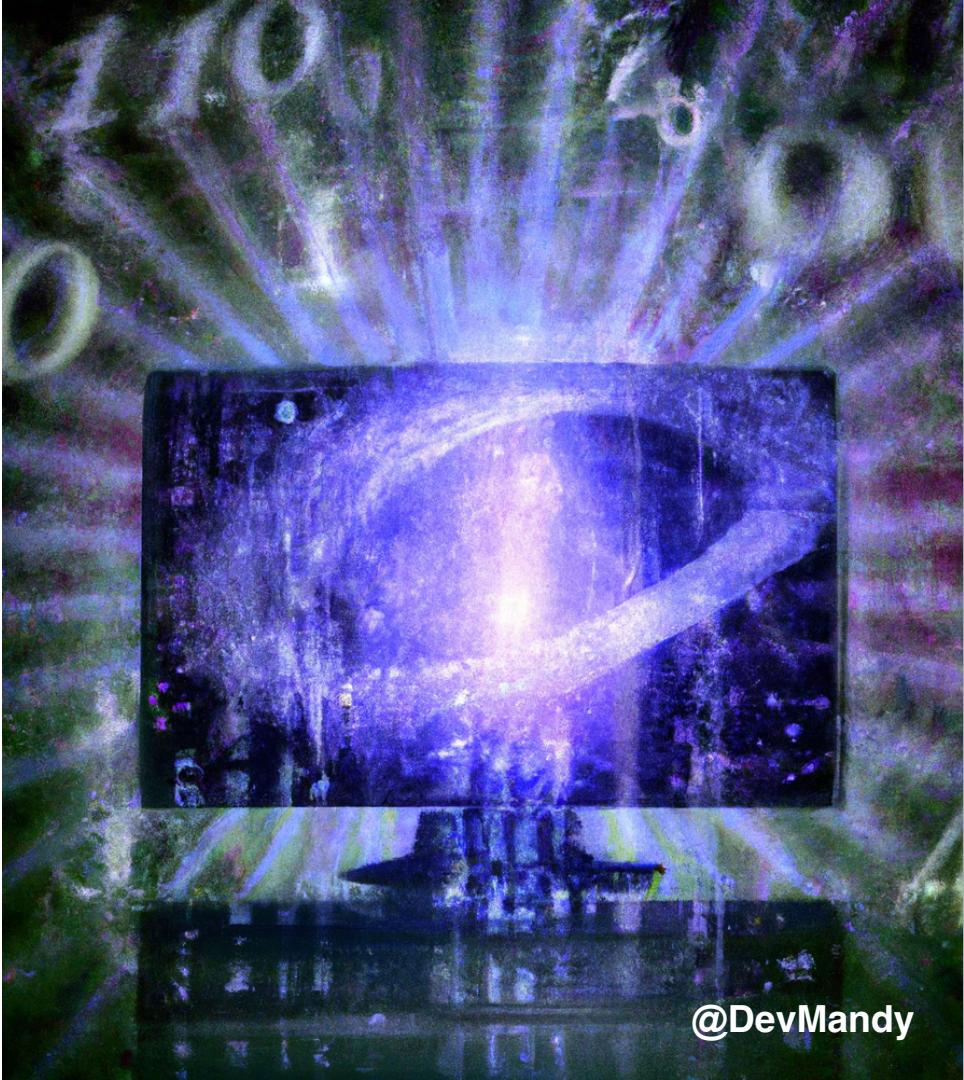
- Fewer merge conflicts



Continuous Integration

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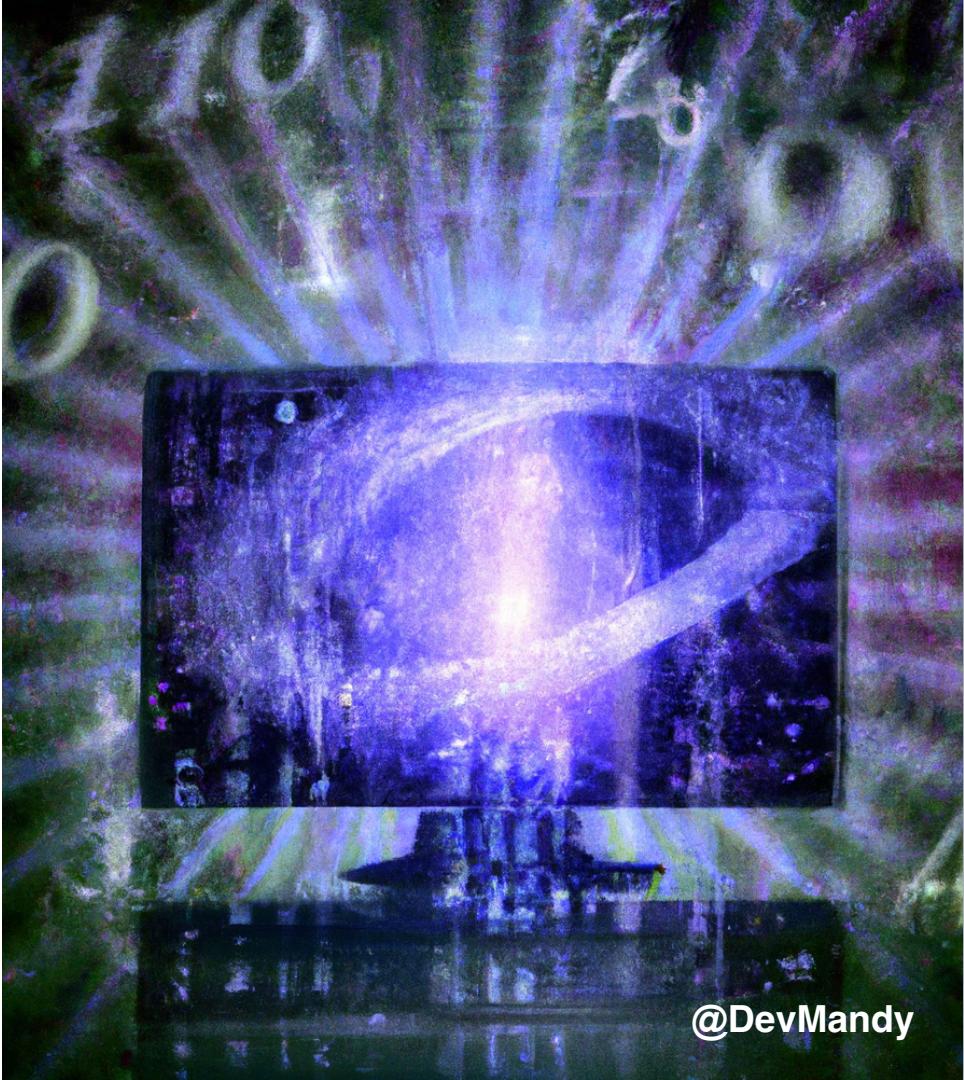
- Fewer merge conflicts
- Shorter feedback loop



Continuous Integration

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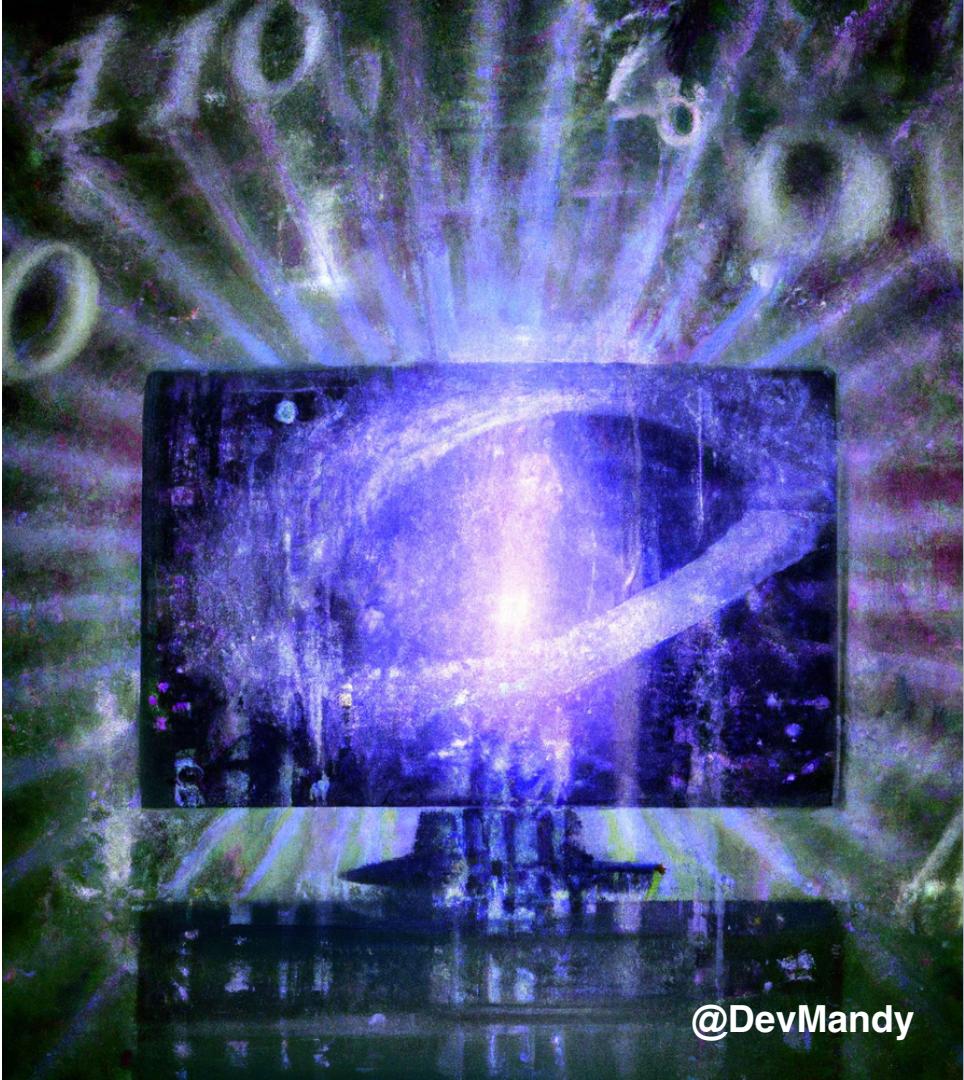
- Fewer merge conflicts
- Shorter feedback loop
- Fail privately



Continuous Integration

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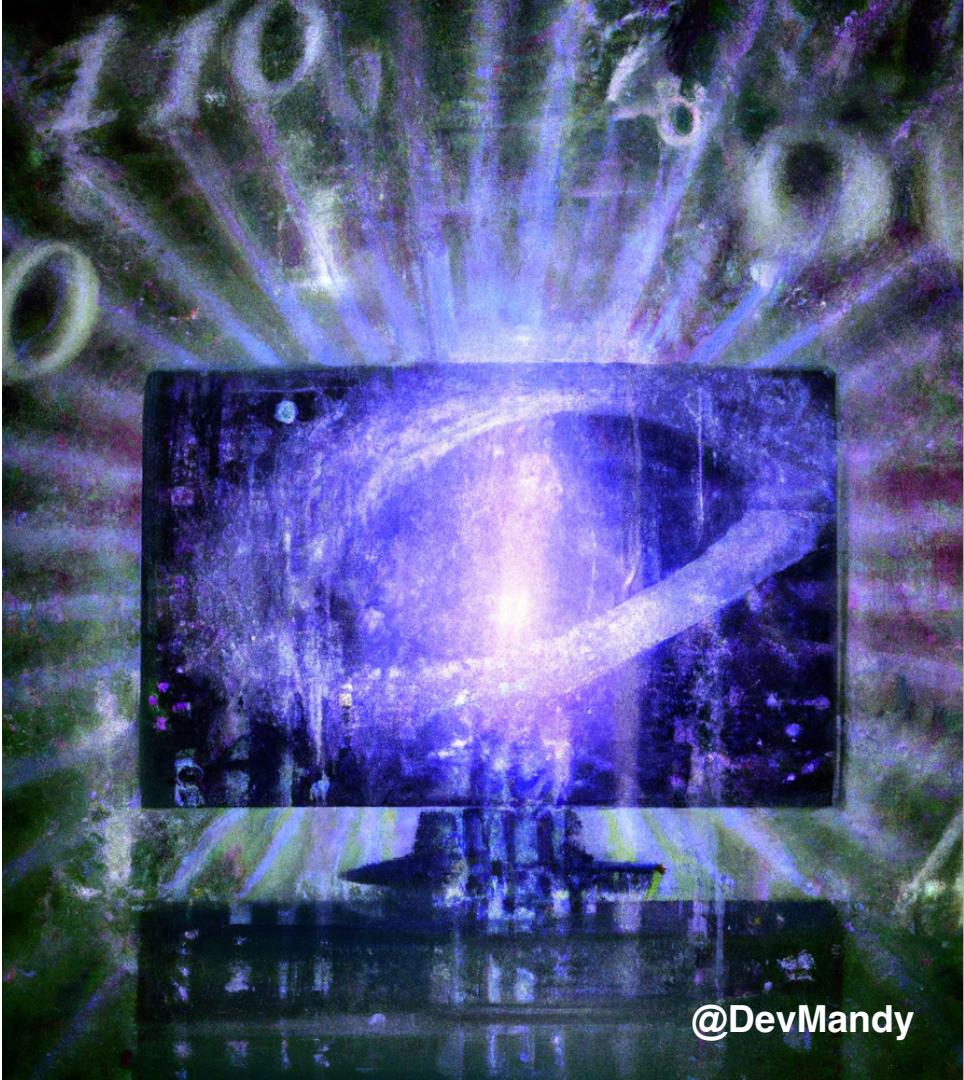
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- Fail privately
- Avoid repetitive work and human error



Continuous Integration

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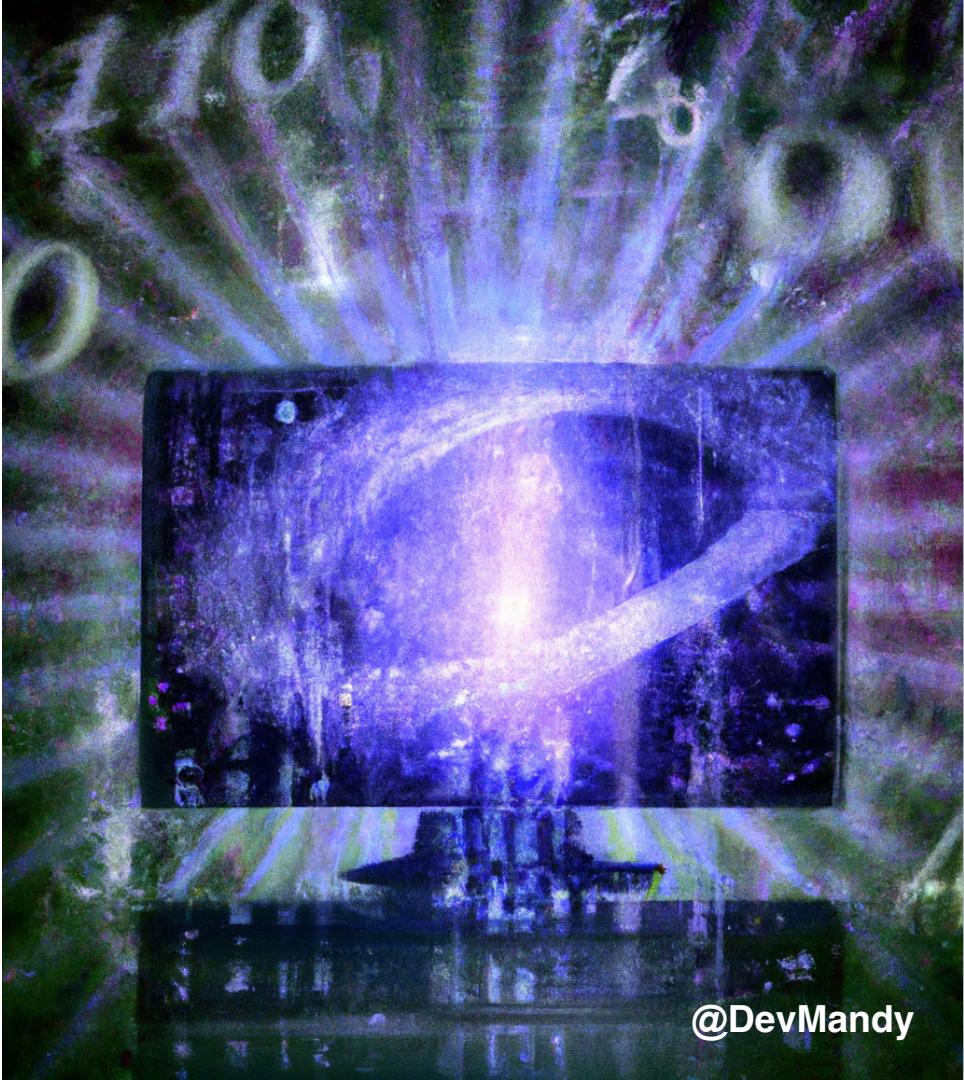
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- Fail privately
- Avoid repetitive work and human error
- Debug problems more easily



Continuous Integration

It's not just for DevOps because...

- Fewer merge conflicts
- Shorter feedback loop
- Fail privately
- Avoid repetitive work and human error
- Debug problems more easily
- Scale development team with less friction

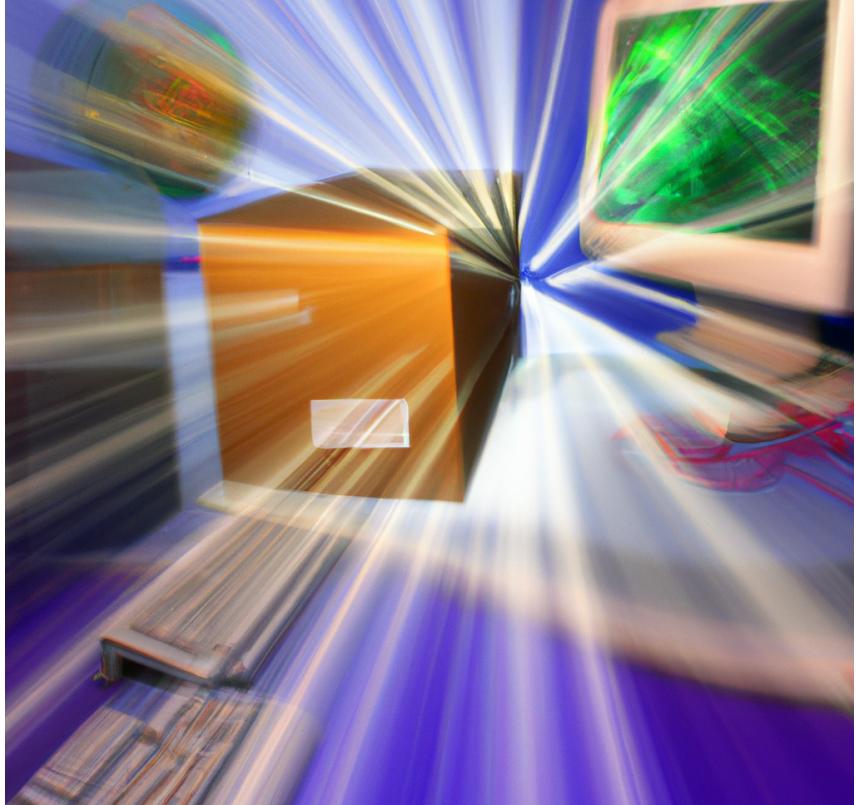


Continuous Delivery

What is it?

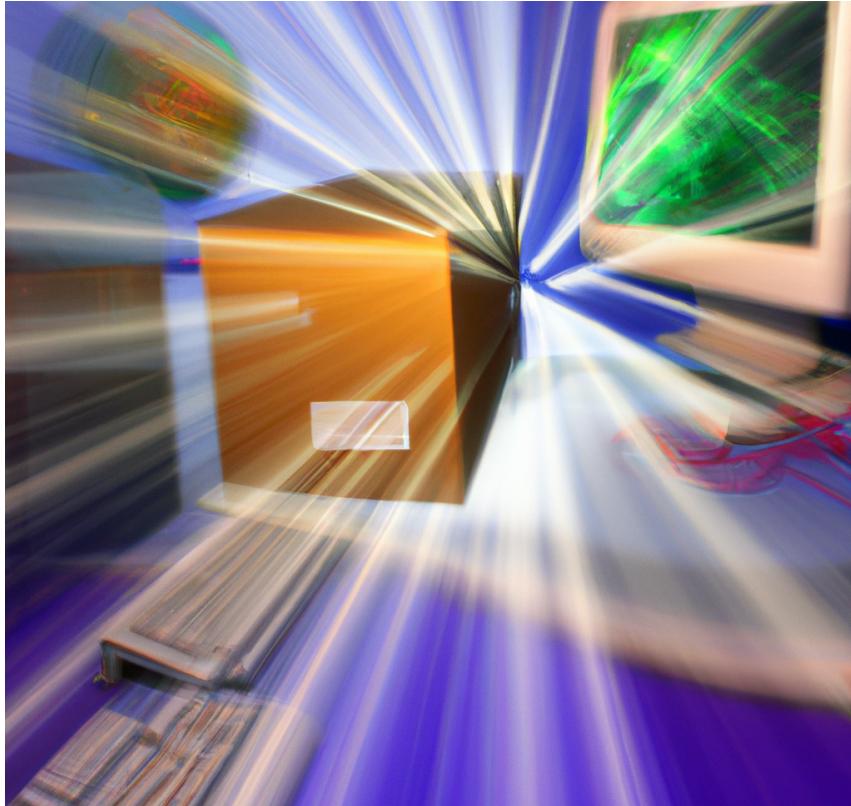
The practice of taking code that has been through continuous integration and packaging it so that it is *ready to be deployed* to production at any time





Continuous Delivery

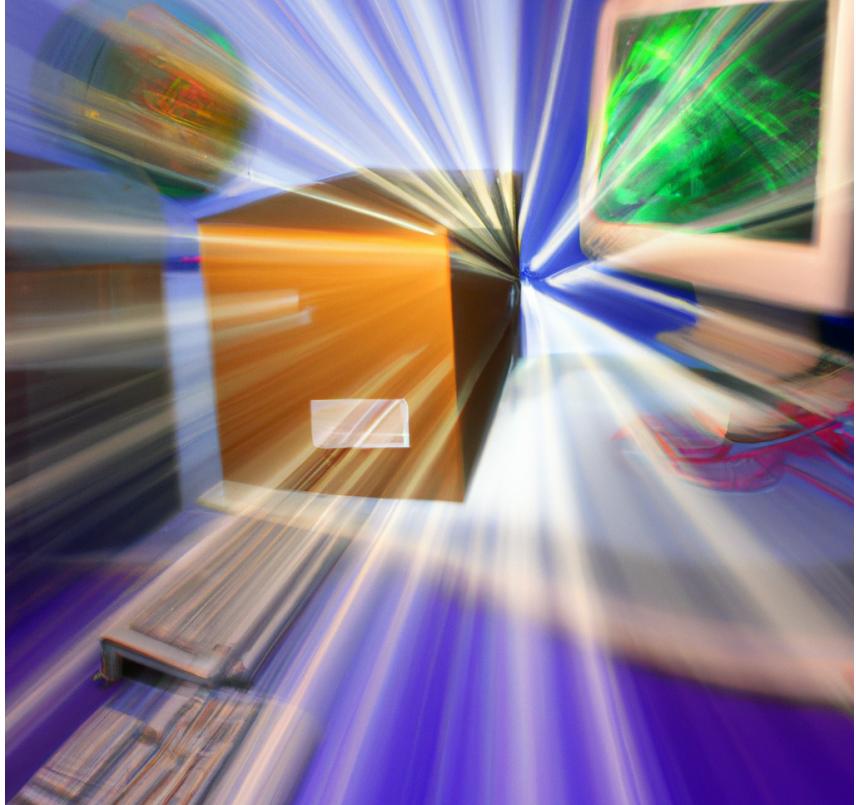
Key Tenets



Continuous Delivery

Key Tenets

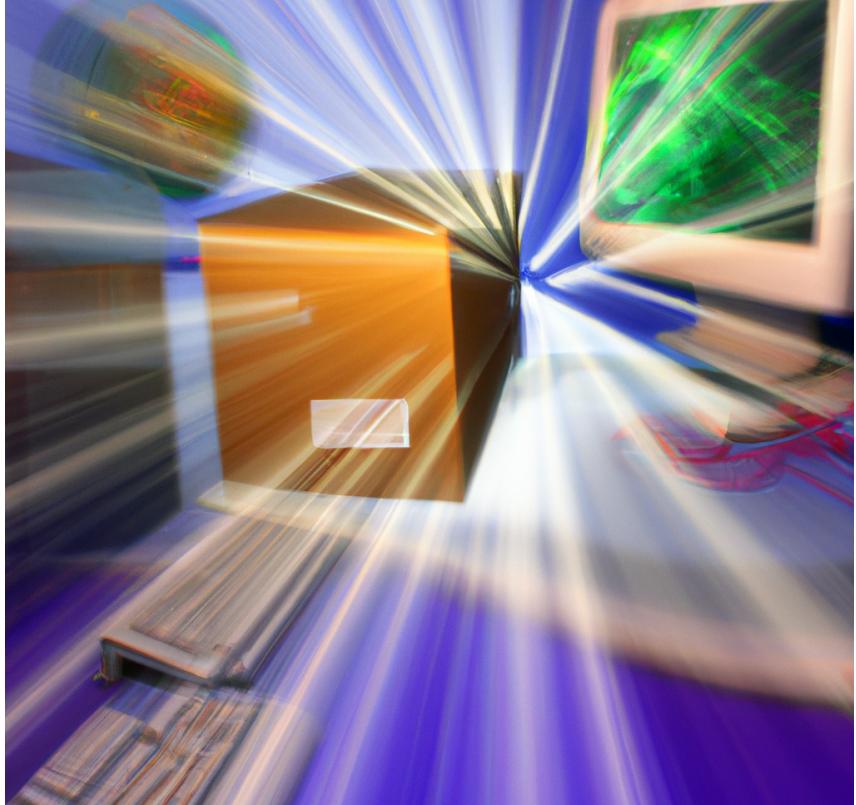
- Automatic deployment to testing and/or staging environment



Continuous Delivery

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- Automated tests (integration tests)



Continuous Delivery

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- Push-button deployments



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- Scheduled releases



Continuous Delivery

Key Tenets

- Automatic deployment to testing and/or staging environment
- Automated tests (integration tests)
- Push-button deployments
- Scheduled releases
- Manual approval process

Continuous Deployment

What is it?

Includes all aspects of continuous delivery and adds the requirement that each code change that passes through all stages of the pipeline successfully is *automatically deployed* to production with no manual intervention



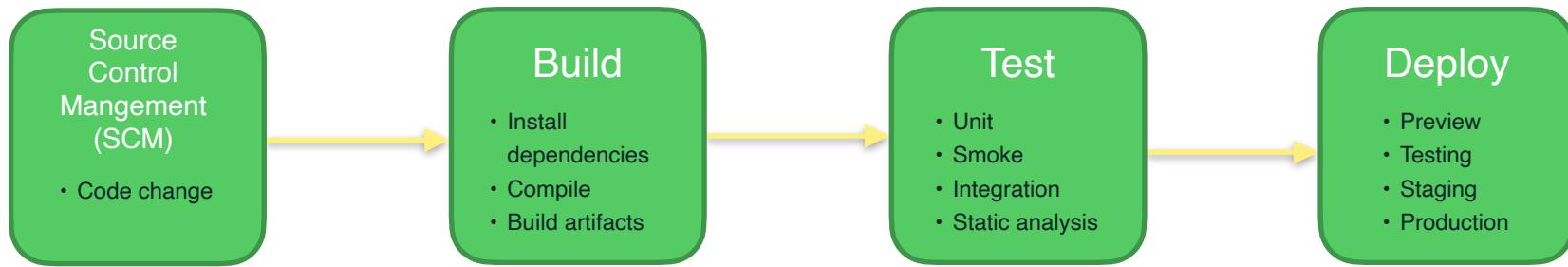
Continuous Deployment

Key Tenets

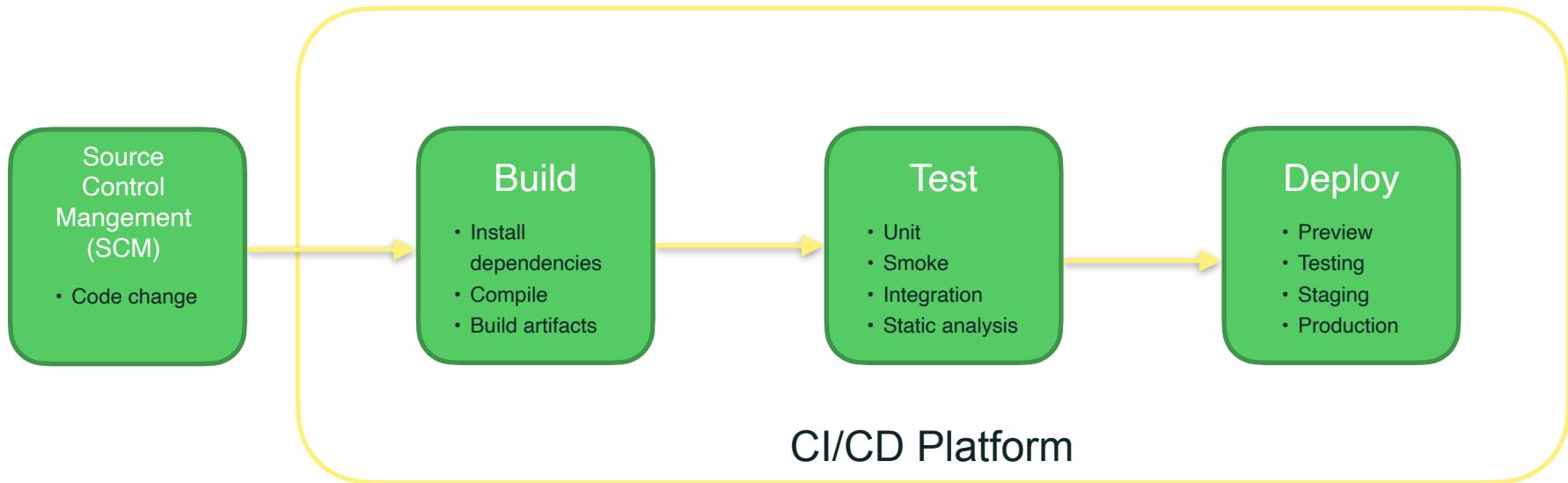
- Automatic deployments
- Guardrails such as canary releases, feature flags, and blue/green deployments



The CI/CD Pipeline



The CI/CD Pipeline



Top CI/CD Tools*	Other CI/CD Tools	
• GitHub Actions (50%)	• QuickBuild	• easyCIS
• Jenkins (36%)	• UrbanCode	• Spinnaker
• GitLab CI/CD (28%)	• Chef	• Concourse CI
• Azure Pipelines (22%)	• BuildMaster	• Jenkins X
• Bitbucket Pipelines (22%)	• Puppet	• Codeship
• AWS CodePipeline	• Meister	• Wercker
• Google Cloud Build	• Vexor	• Semaphore
• CircleCI	• Continua CI	• Solano Labs
• Atlassian Bamboo	• digital.ai	• AppVeyor CI
• TeamCity	• Codefresh	• Shippable
• HashiCorp	• Nevercode	• Codemagic
• Travis CI	• Buddybuild	• Distelli
• Octopus Deploy	• Phabricator	• FinalBuilder
• JFrog Pipelines	• Copado	• GoCD
• Bitrise	• AutoRabit	• PHPCI
• CloudBees	• Tekton	• CruiseControl
• Buddy	• Continuum	• Integrity
• BuildKite	• CABIE	• Gump
• Harness	• Drone CI	• Strider
	• Buildbot	• IBM Cloud Continuous Delivery

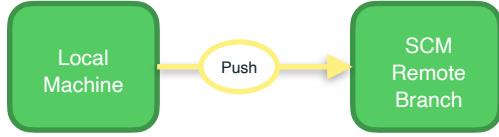
*According to Postman's 2022 State of the API Report

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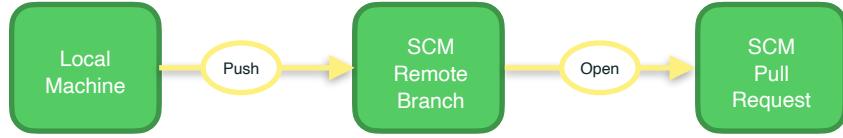
Breakdown of the CI/CD Pipeline



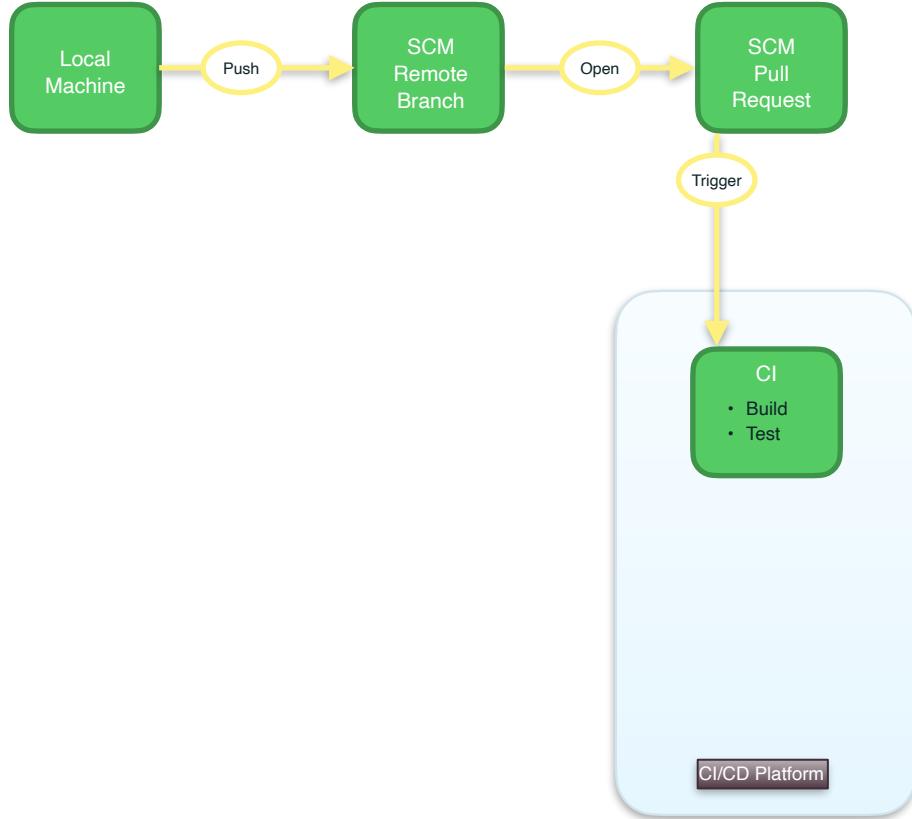
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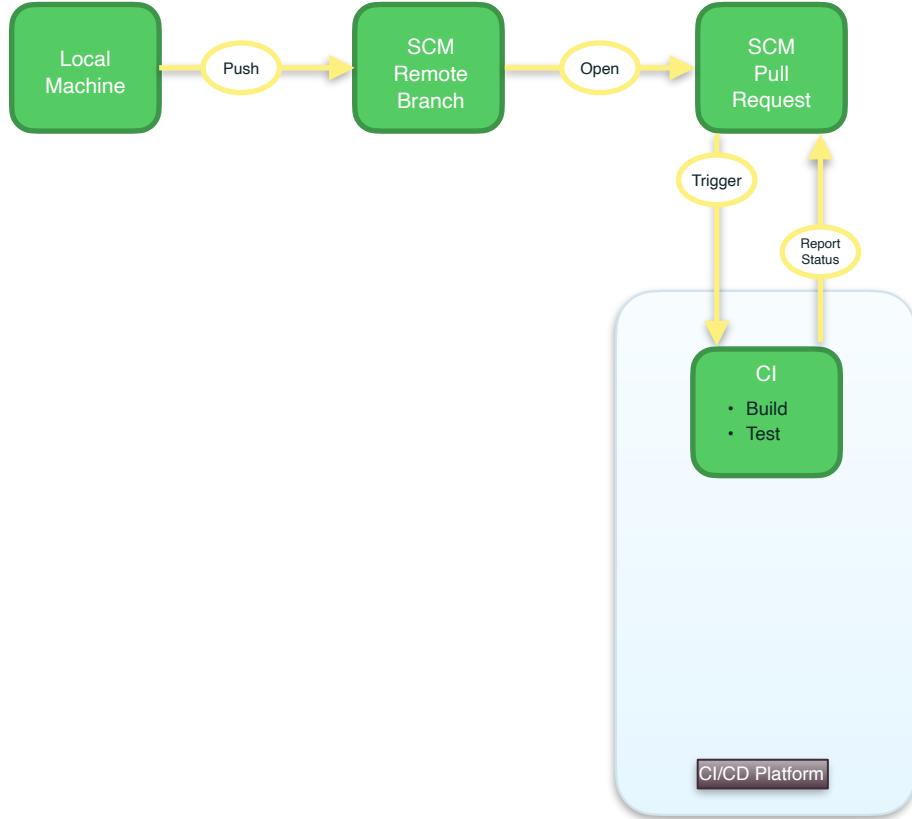
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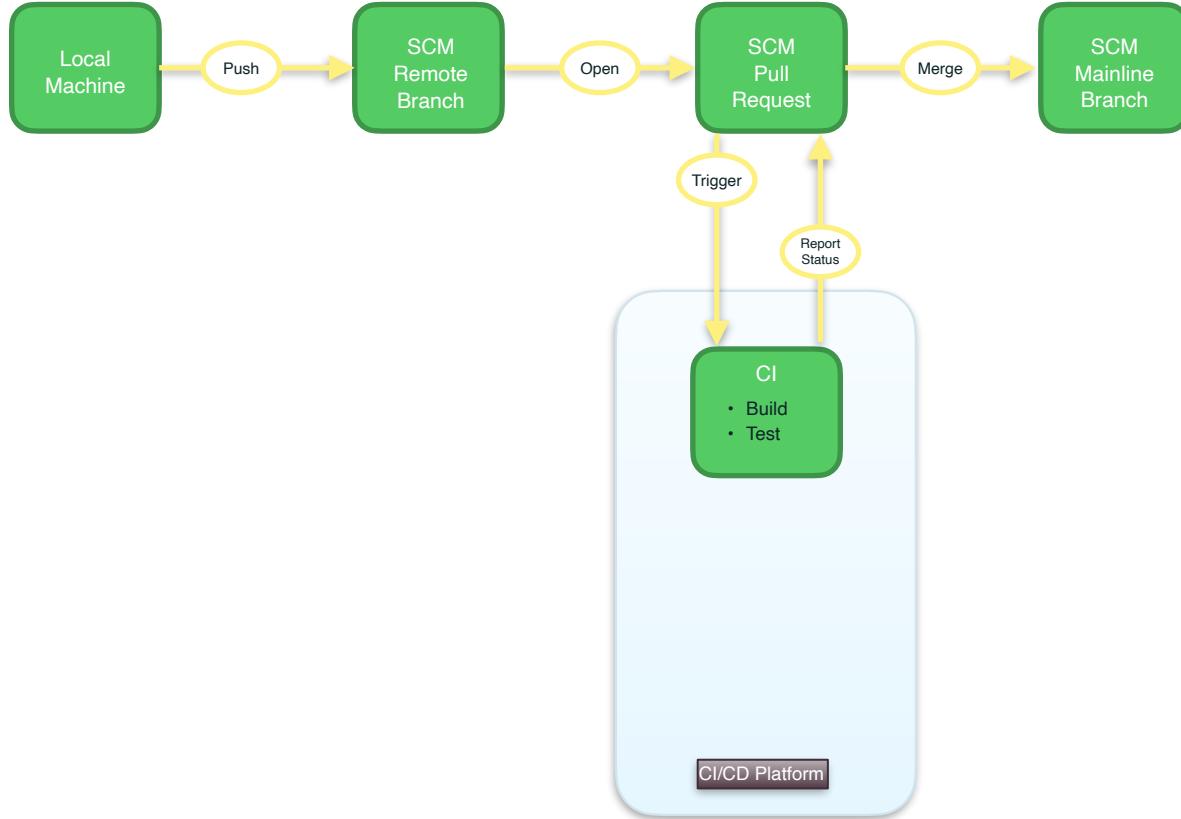
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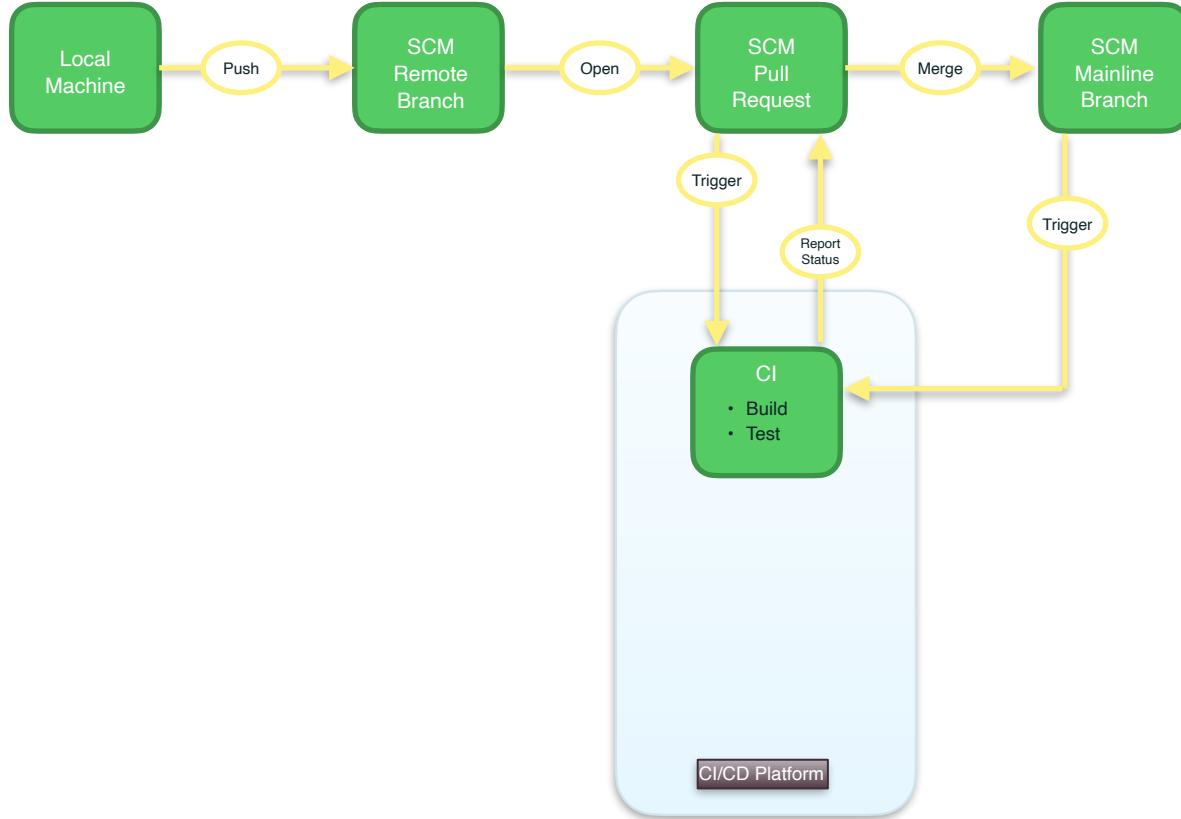
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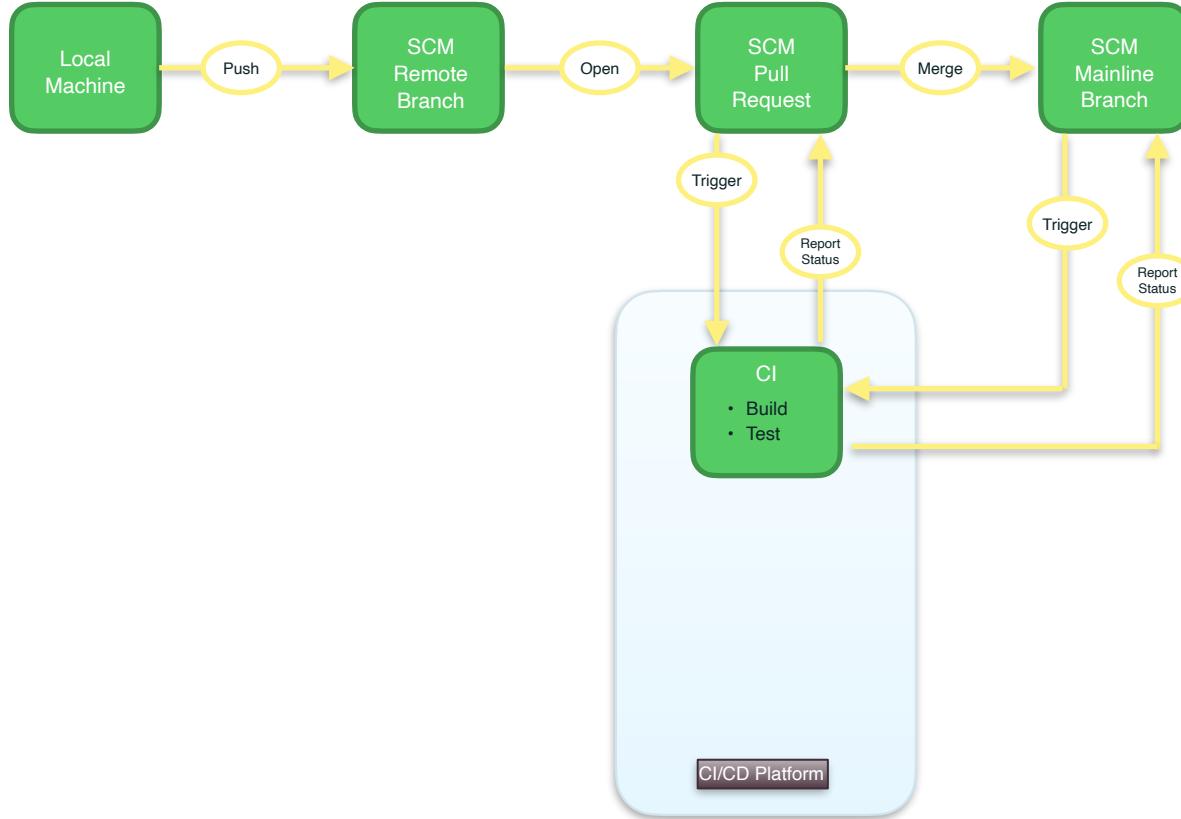
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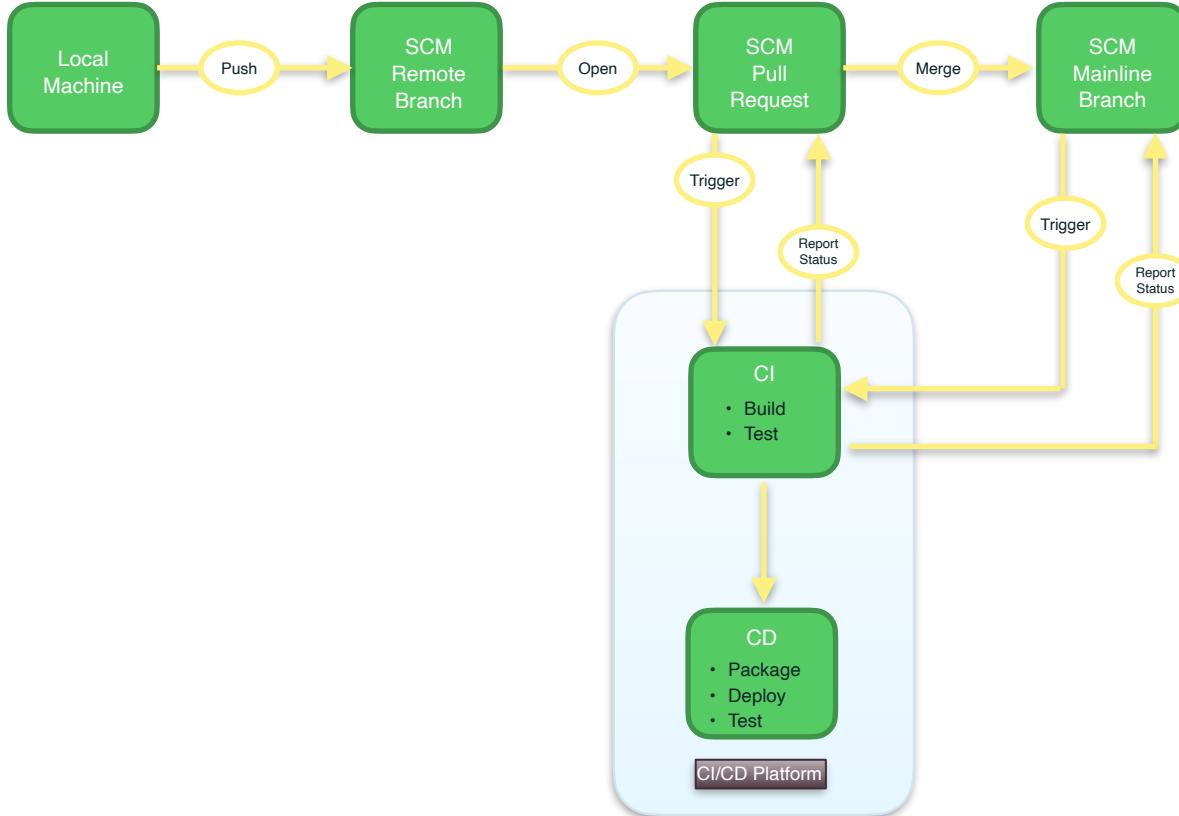
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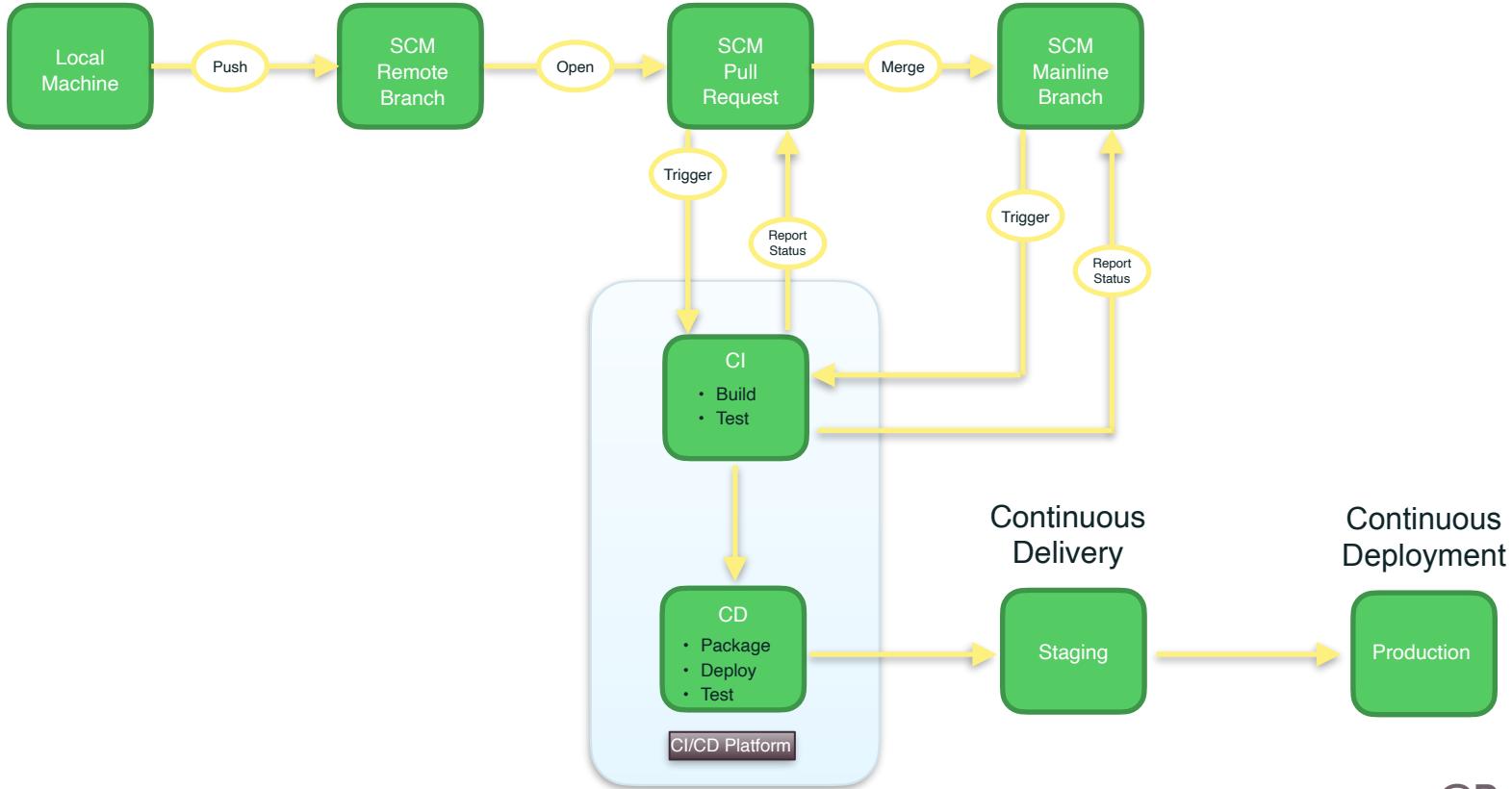
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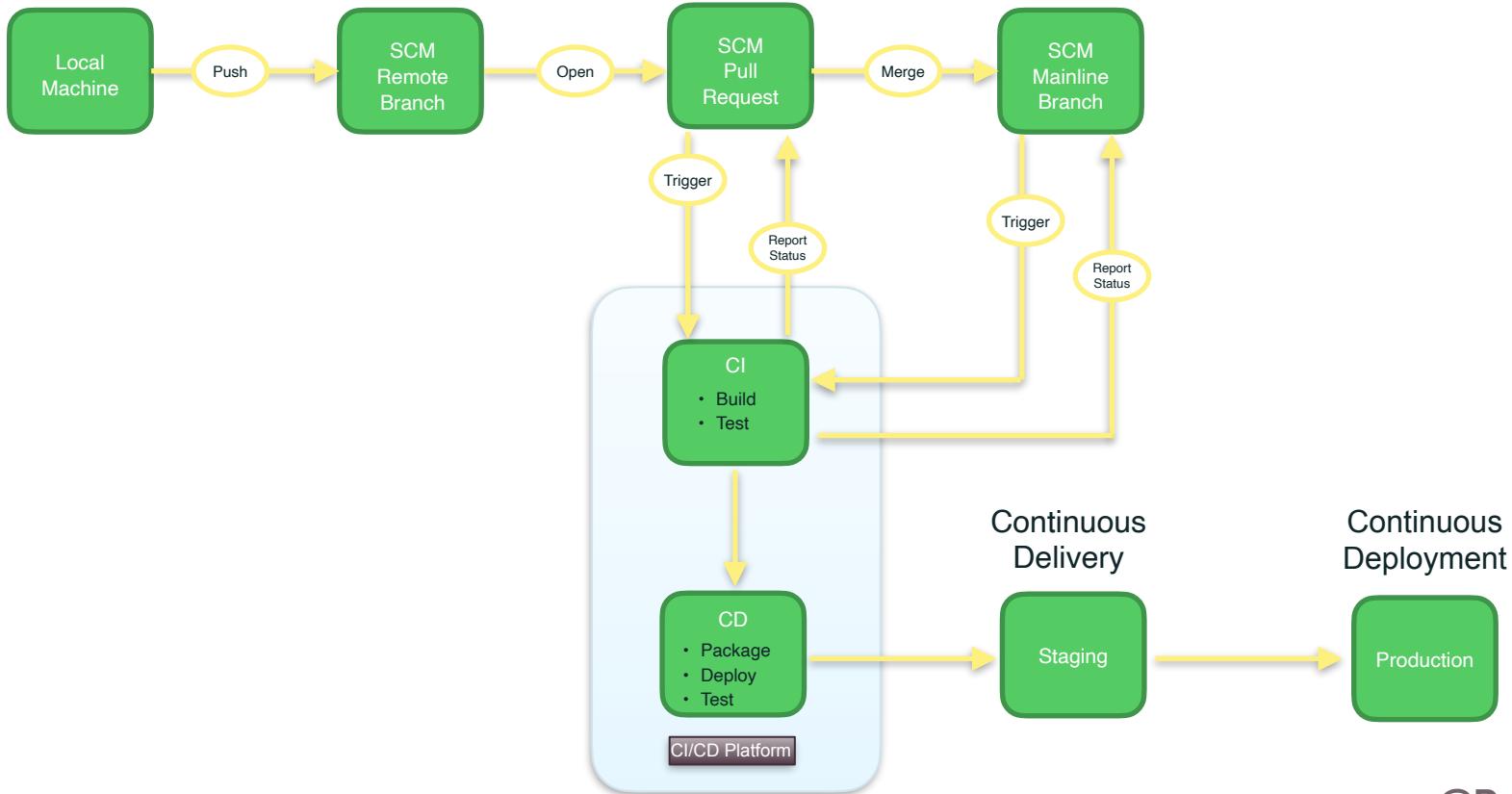
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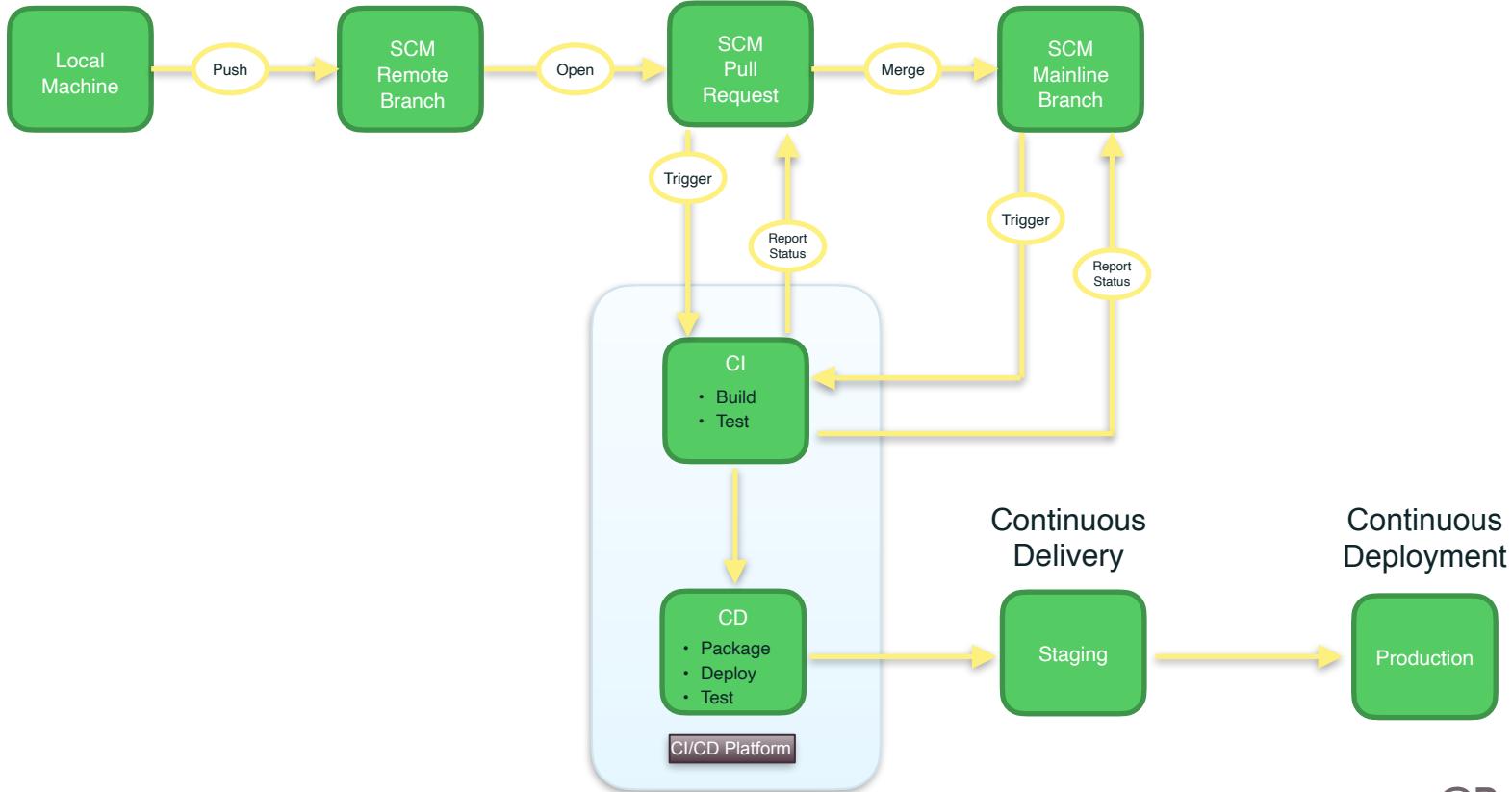
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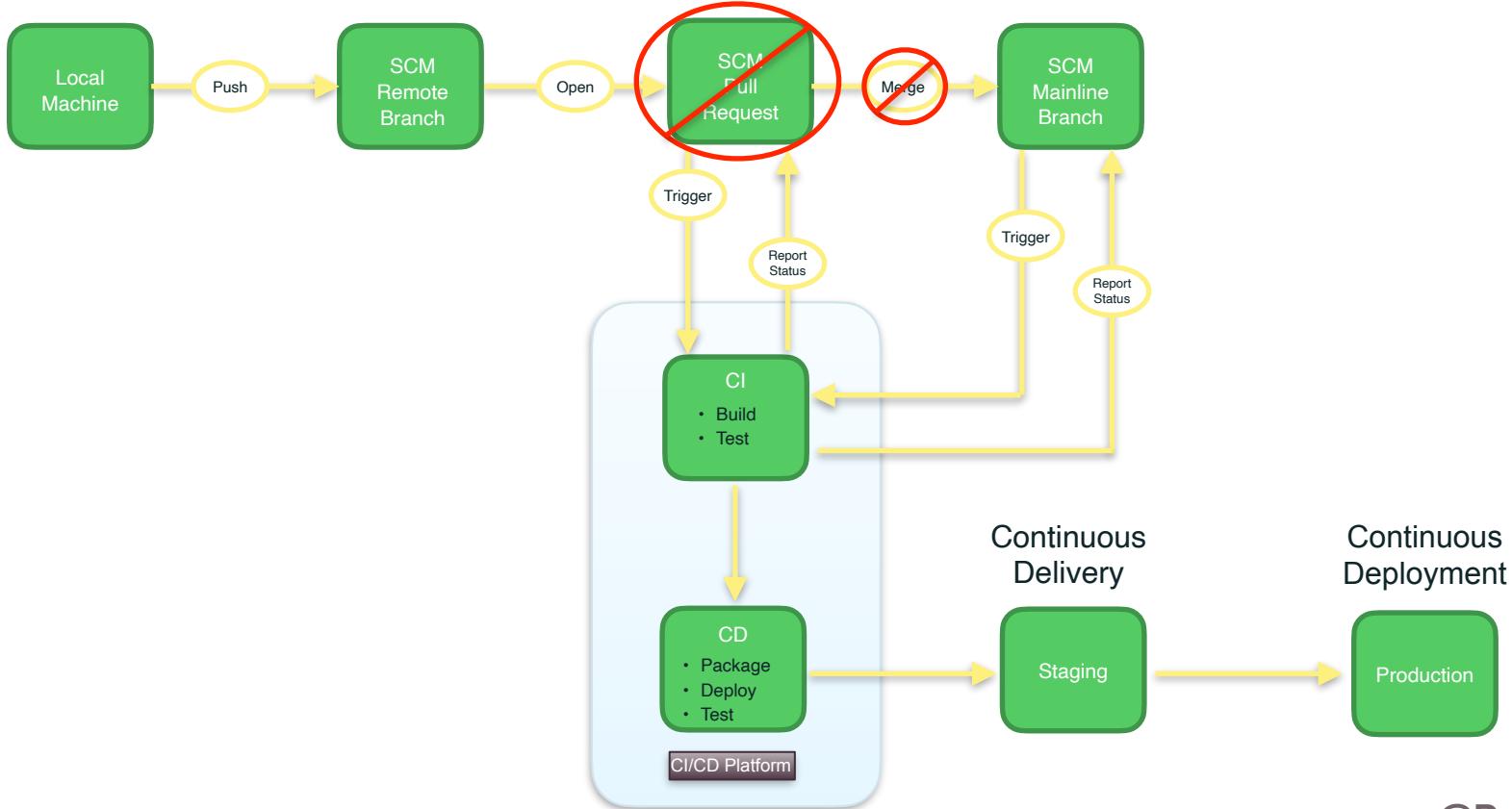
But what about failures???



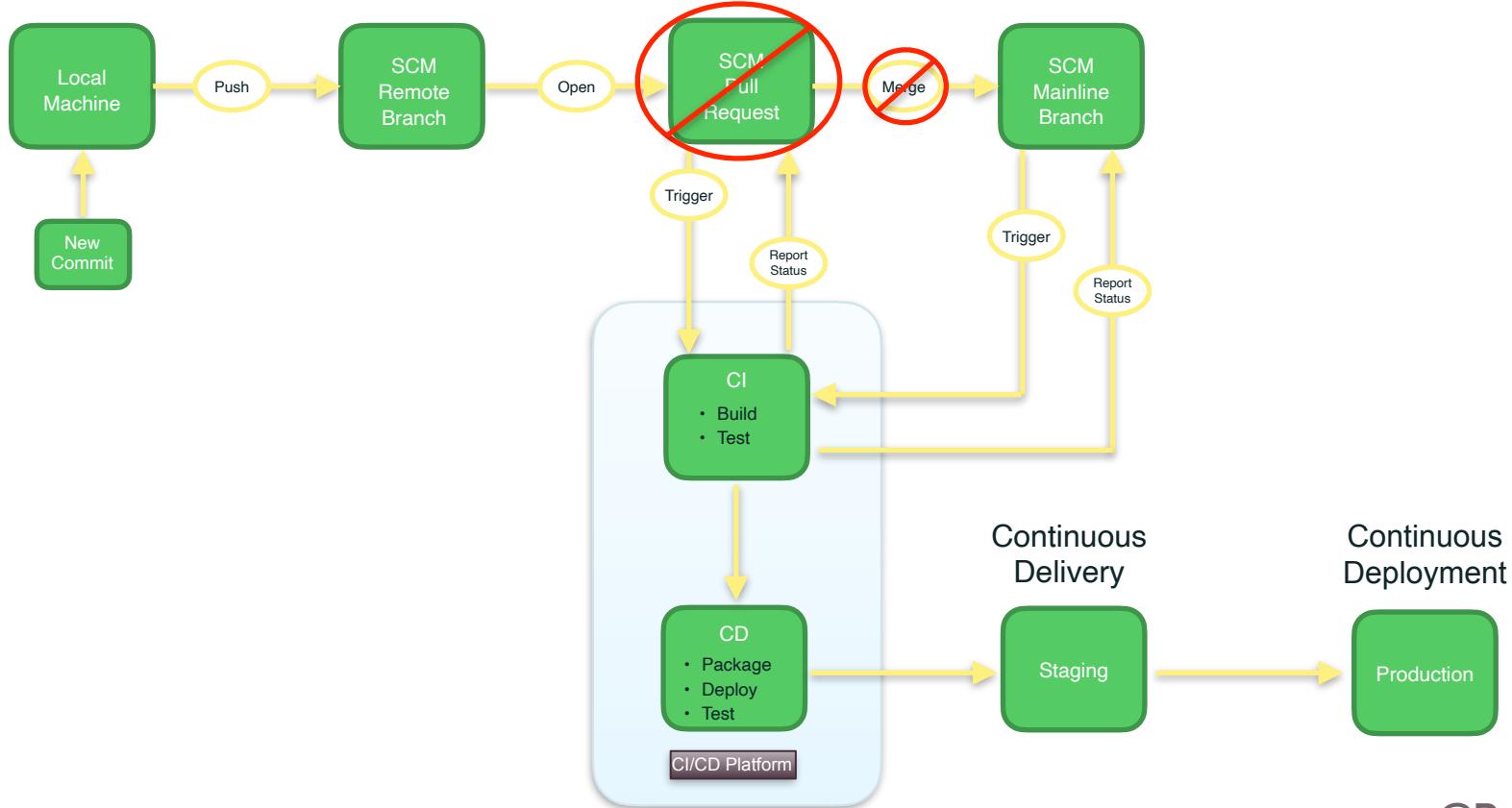
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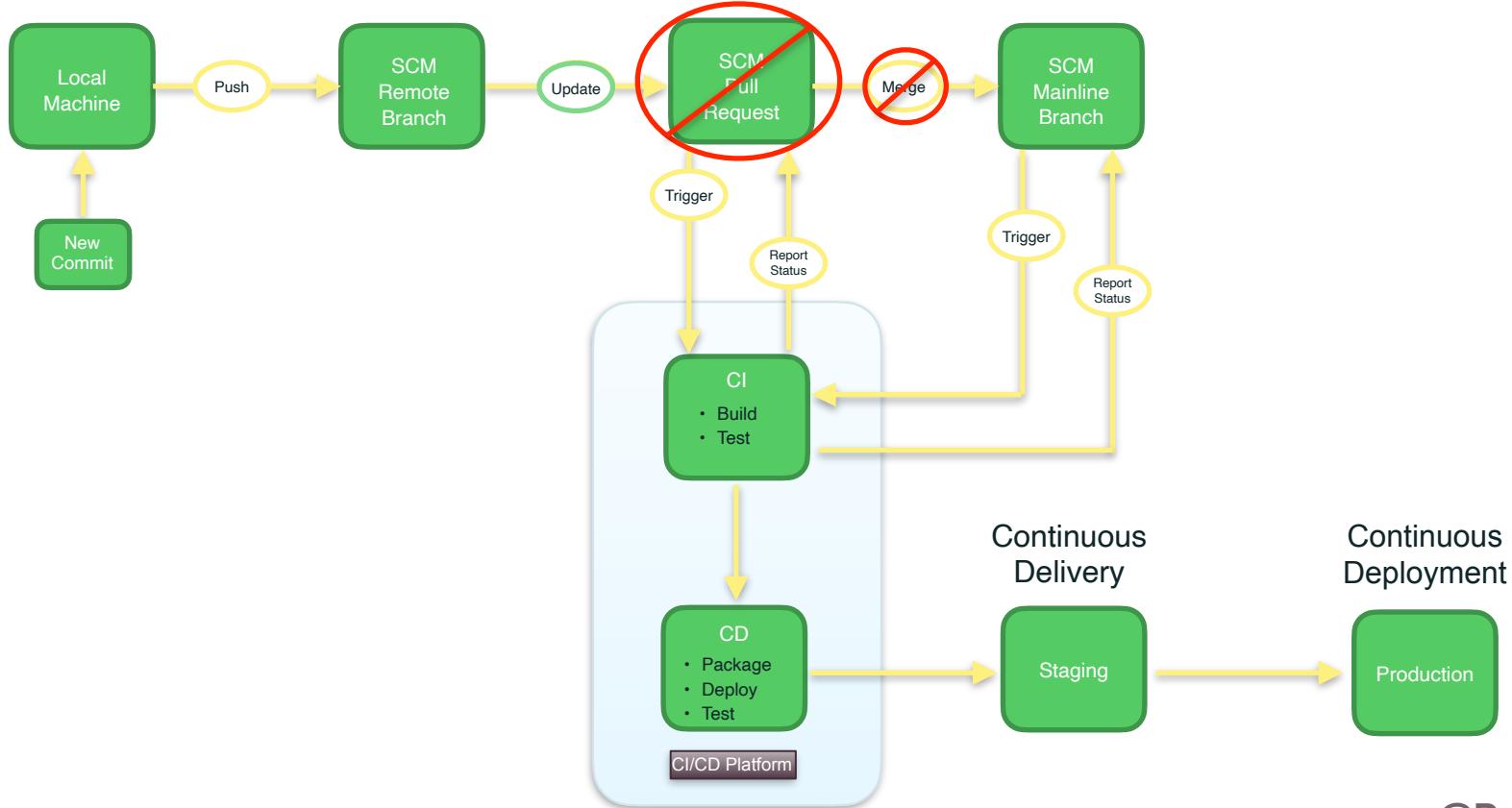
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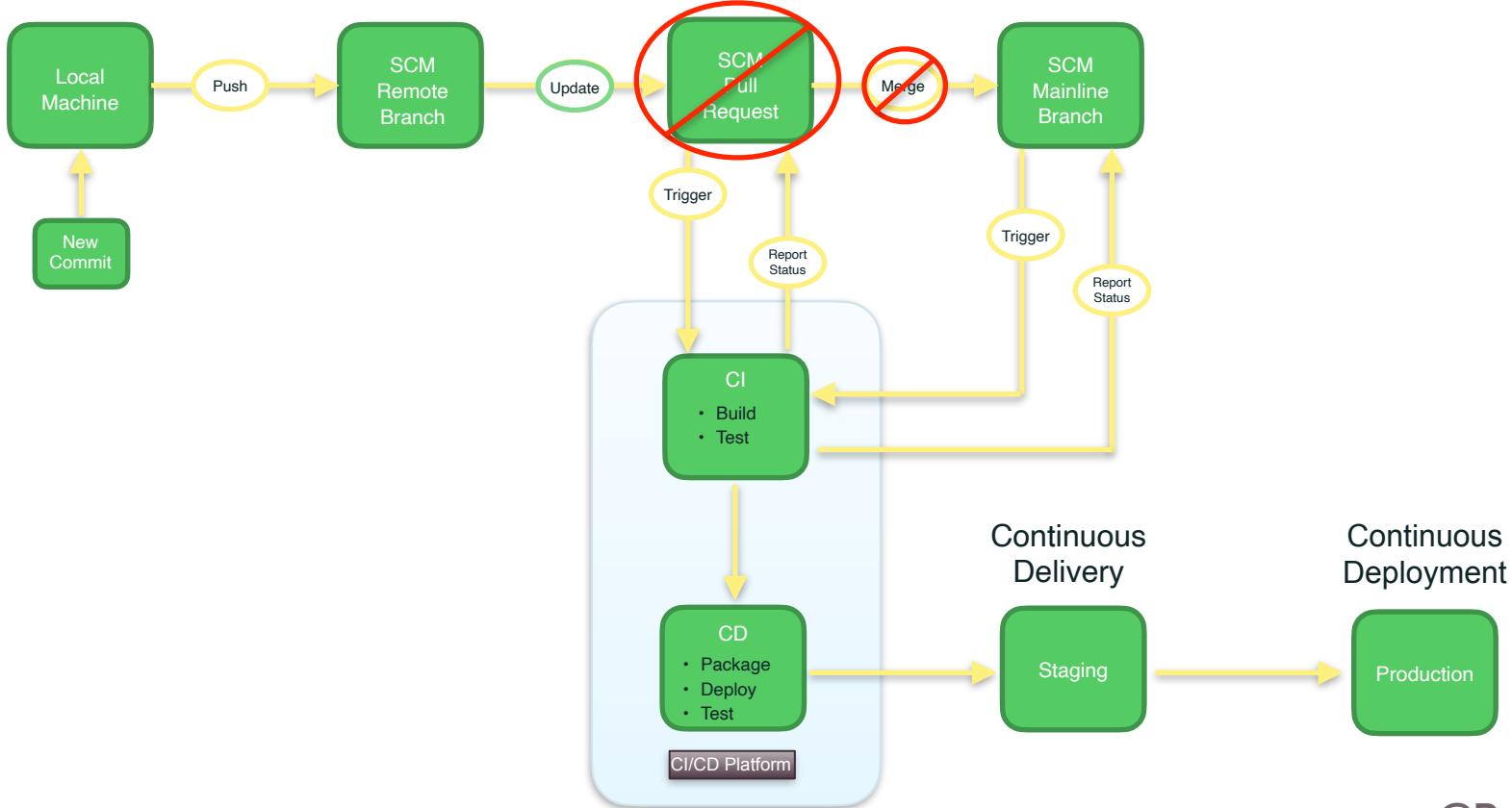
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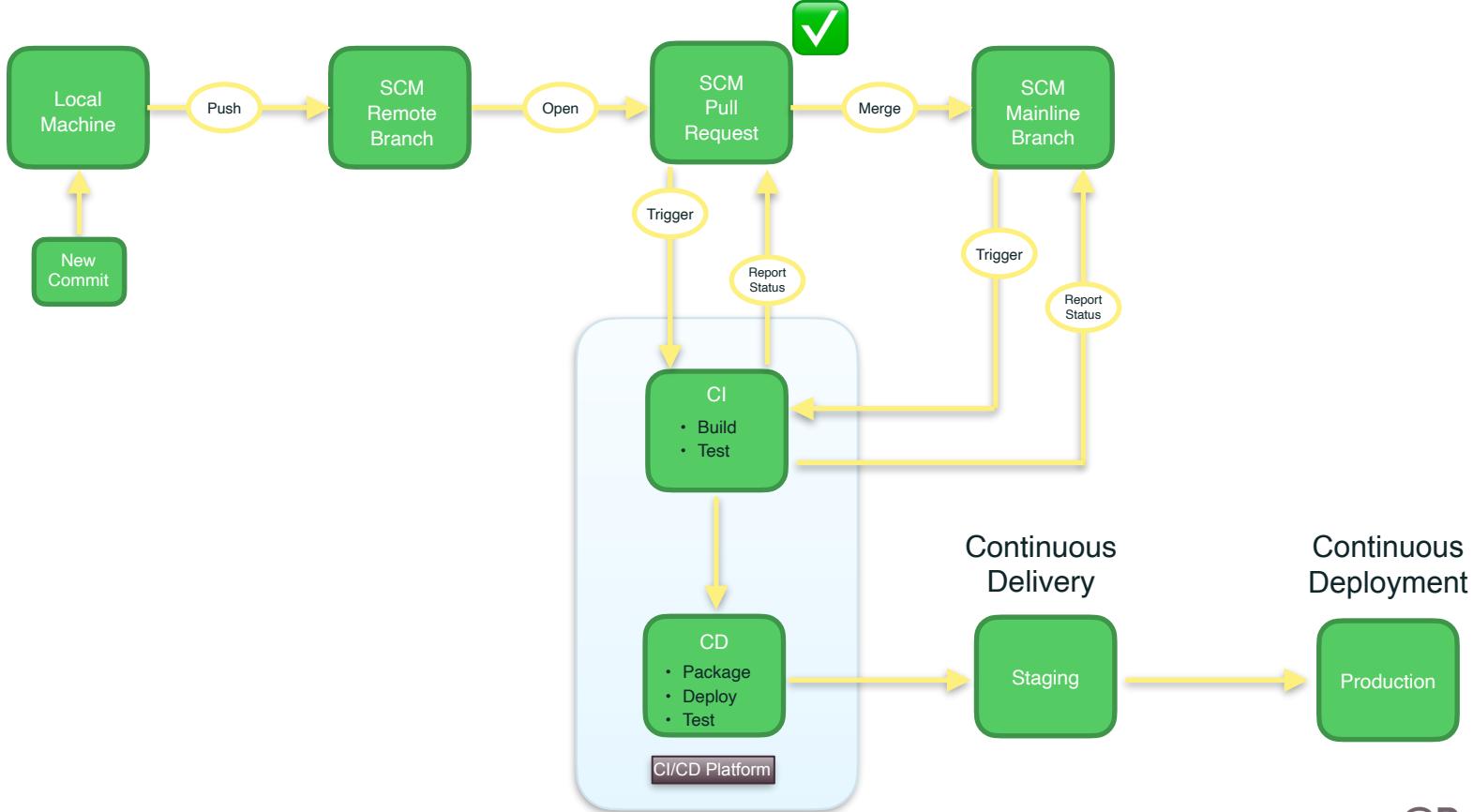
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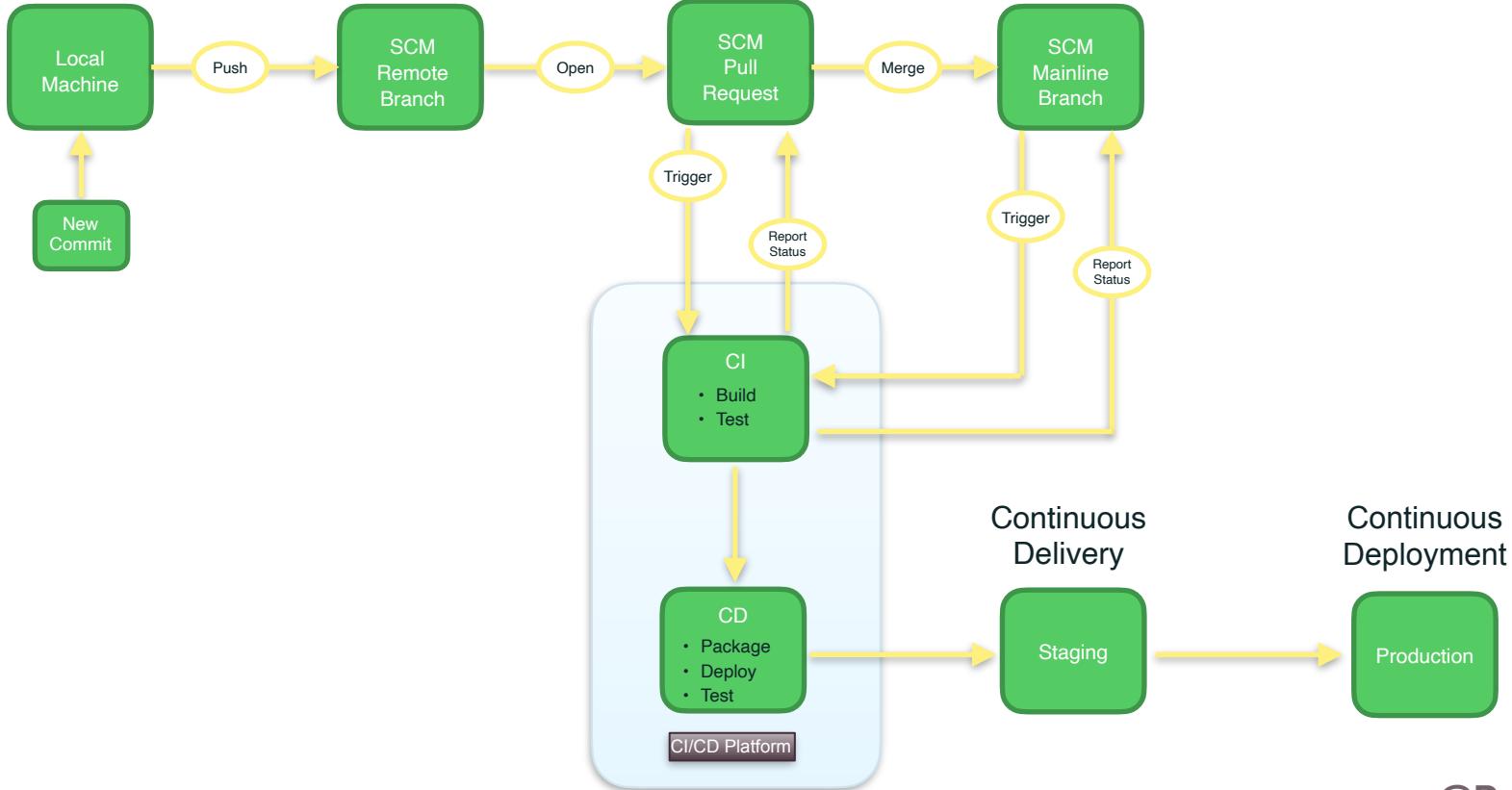
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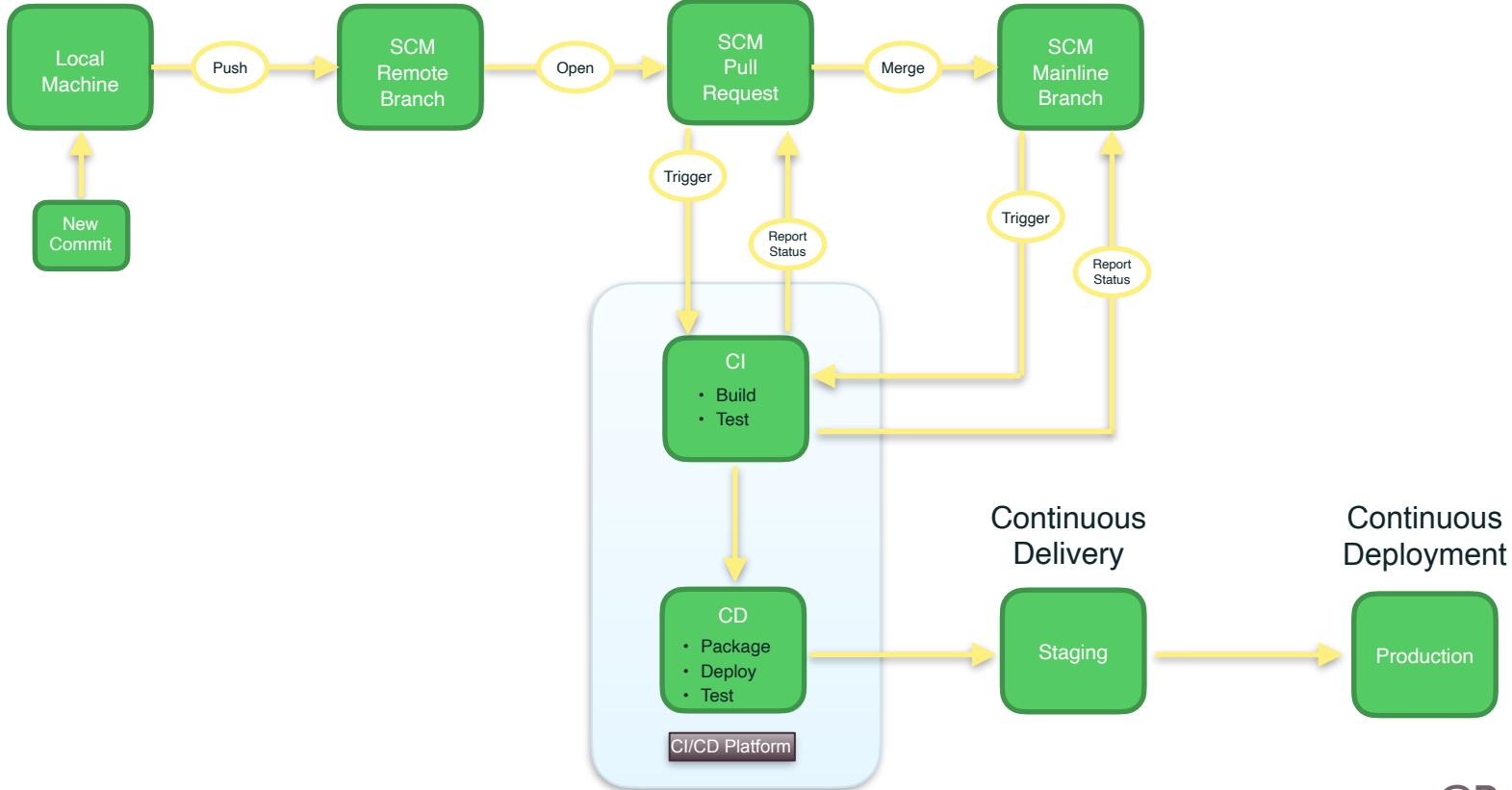
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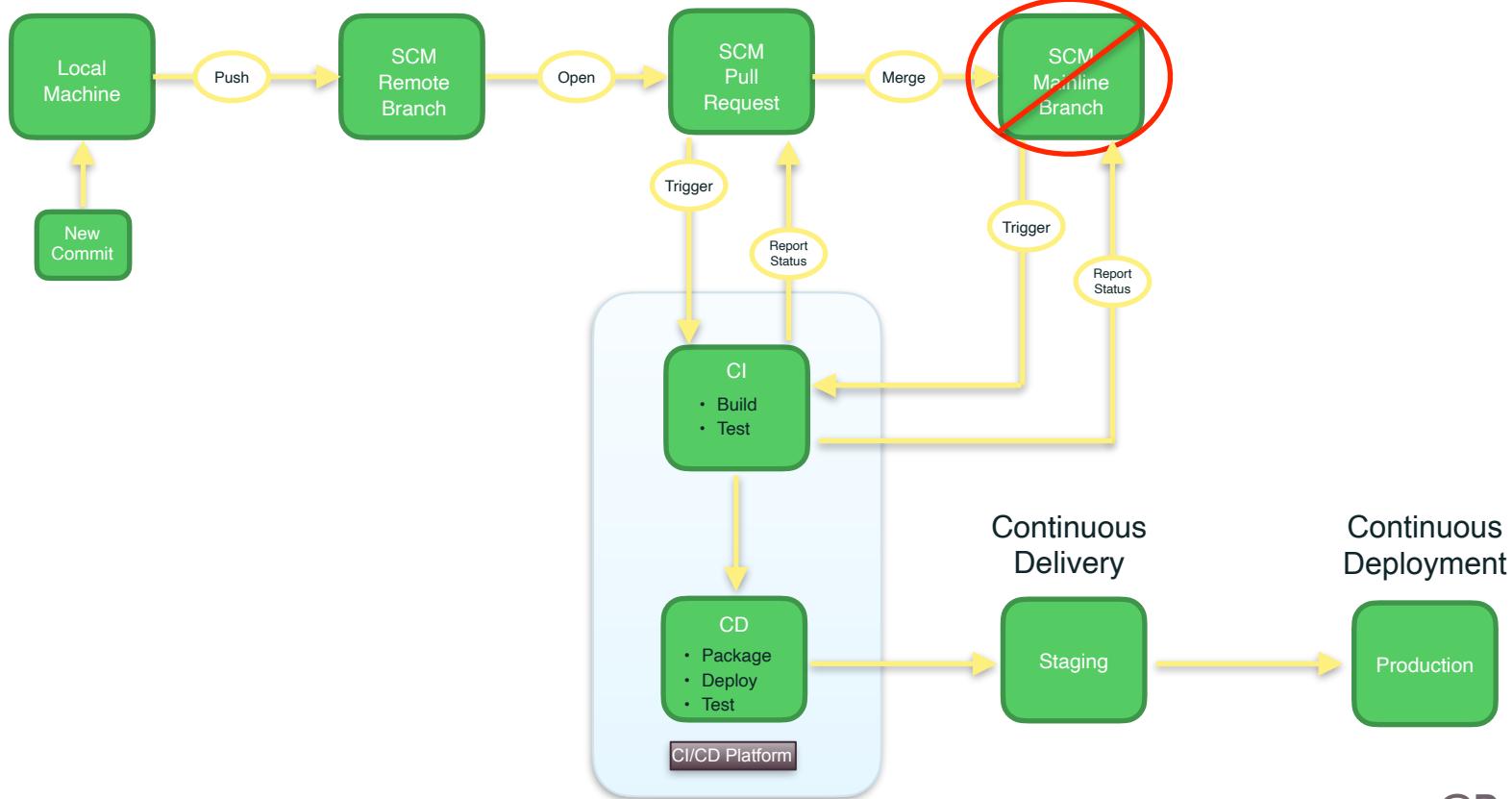
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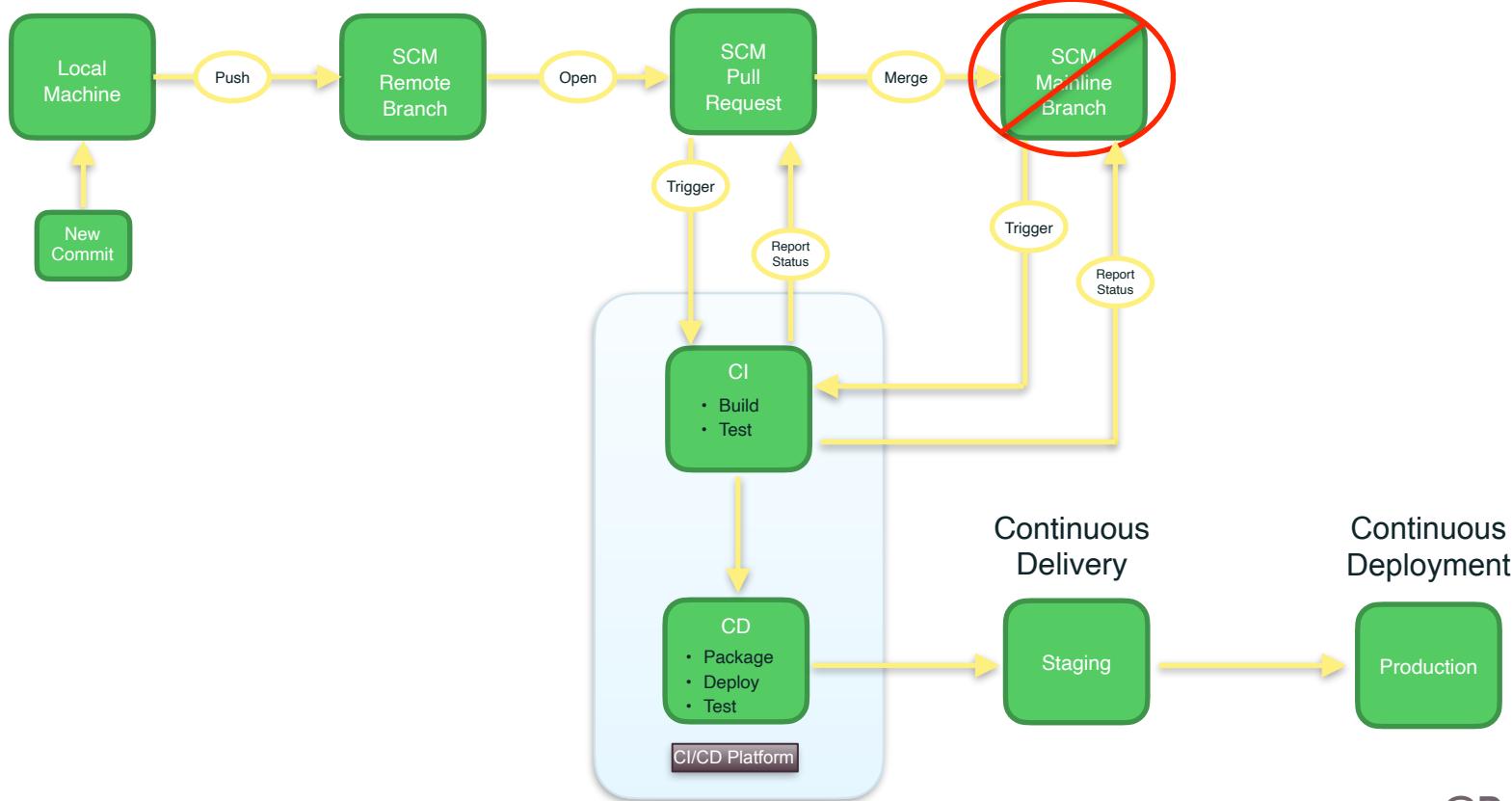
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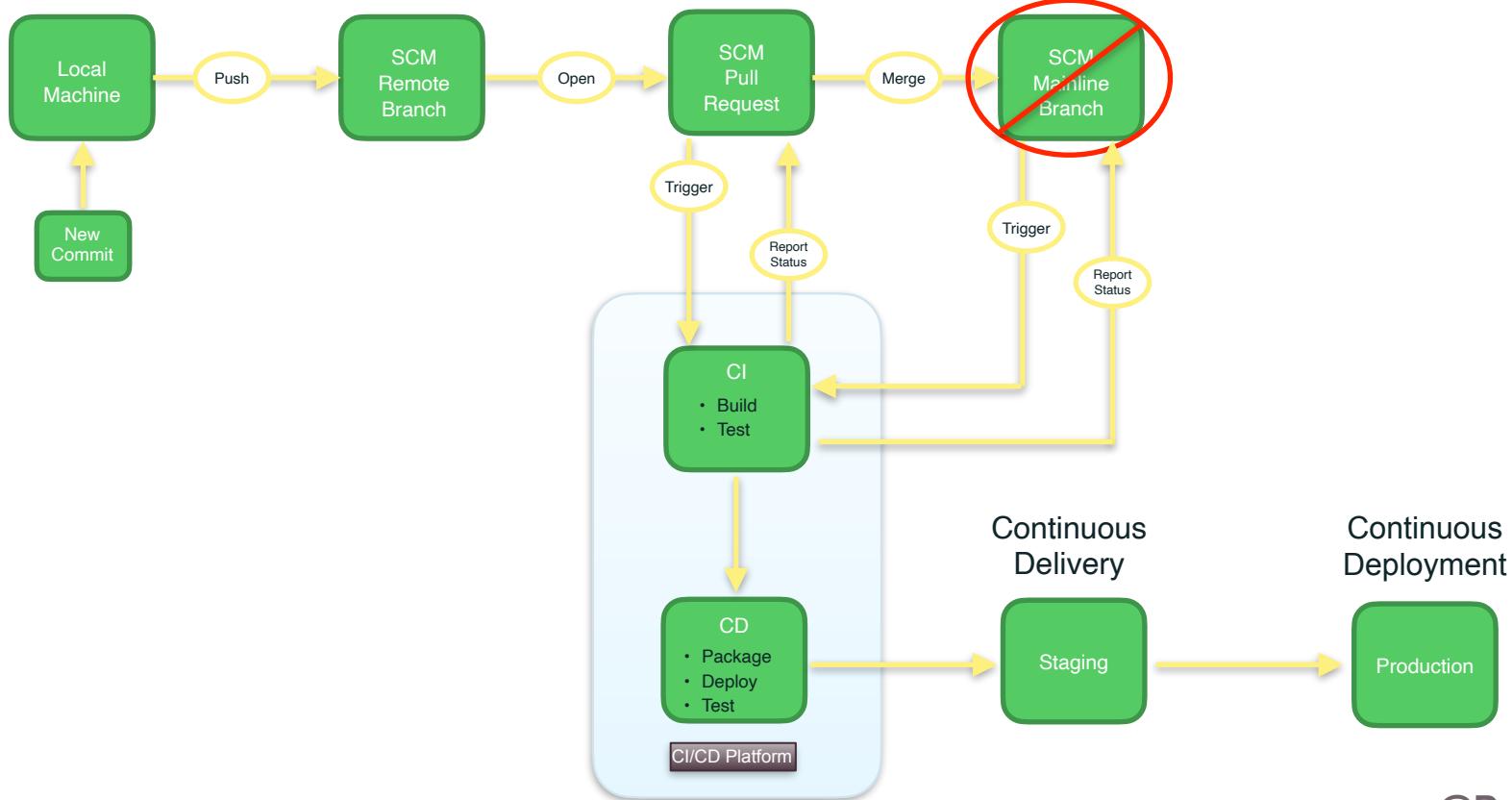
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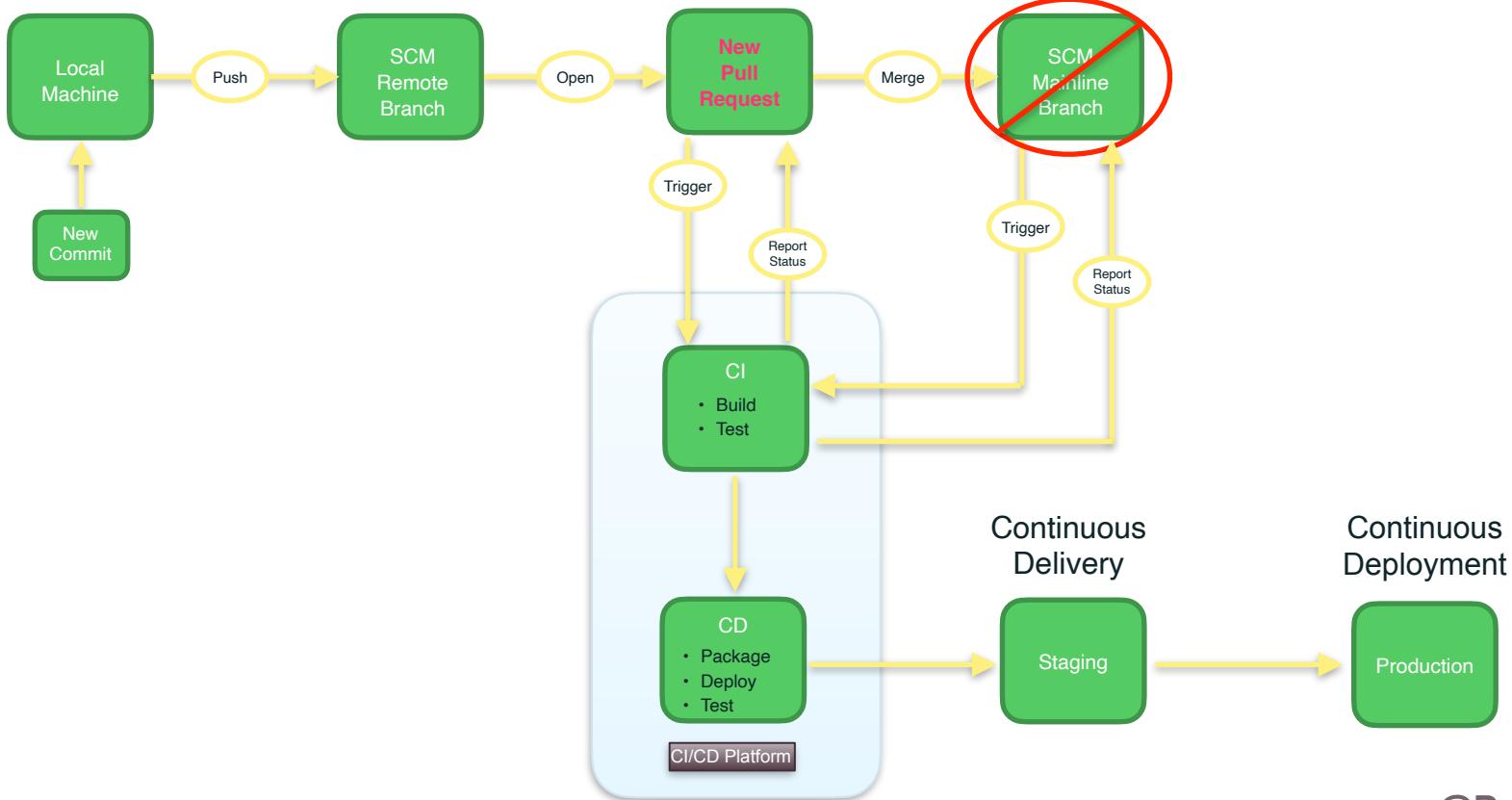
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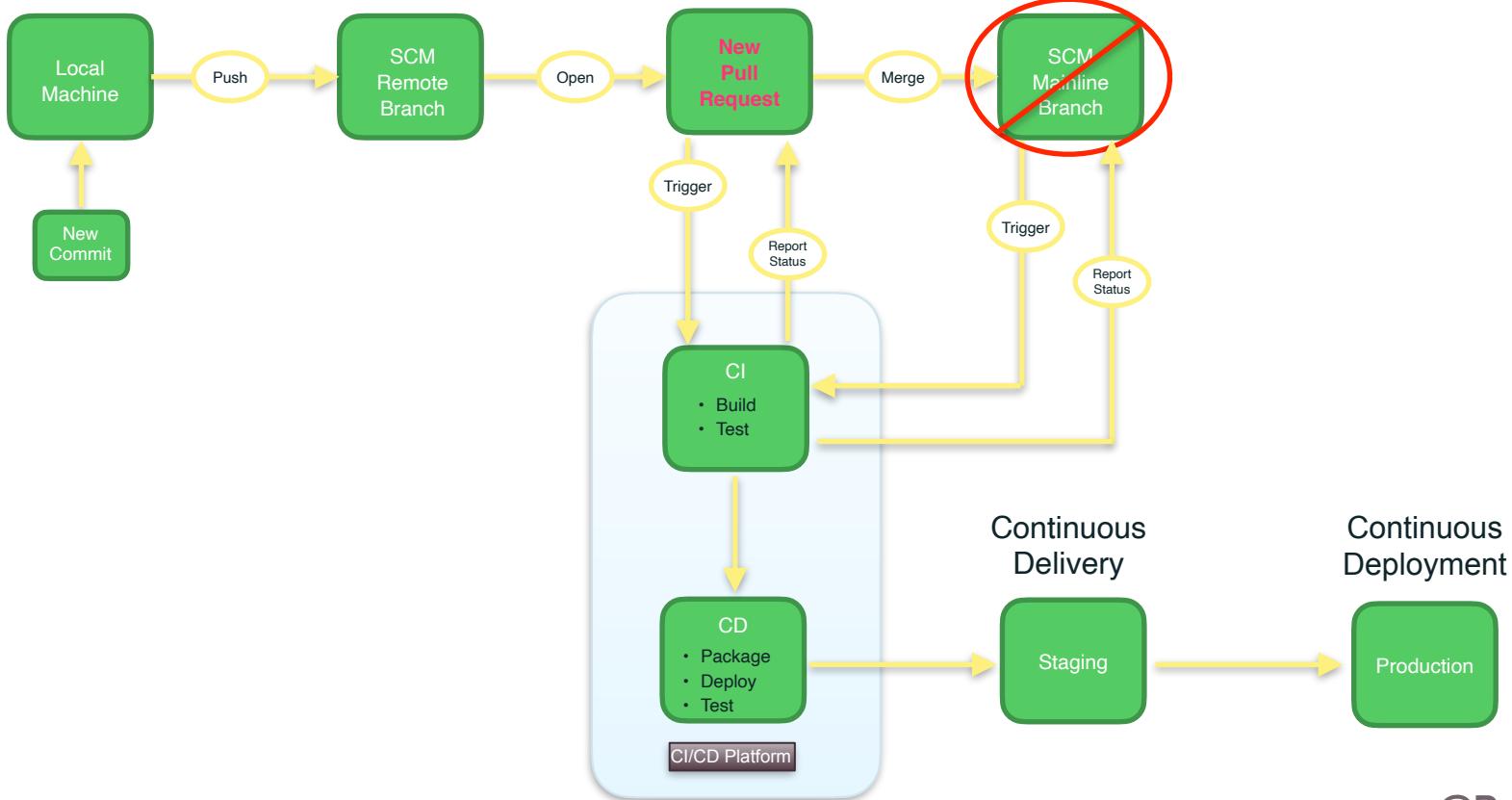
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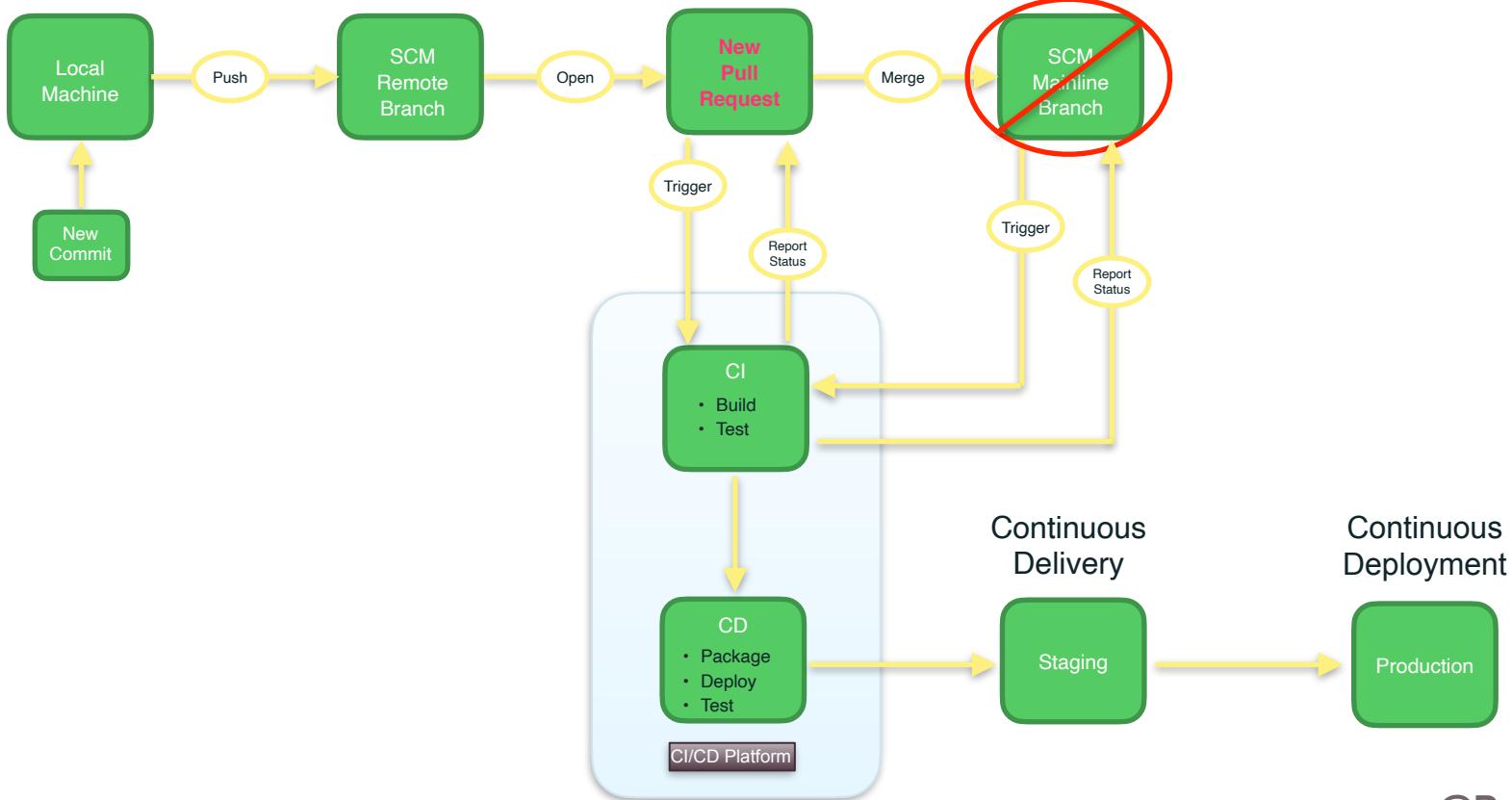
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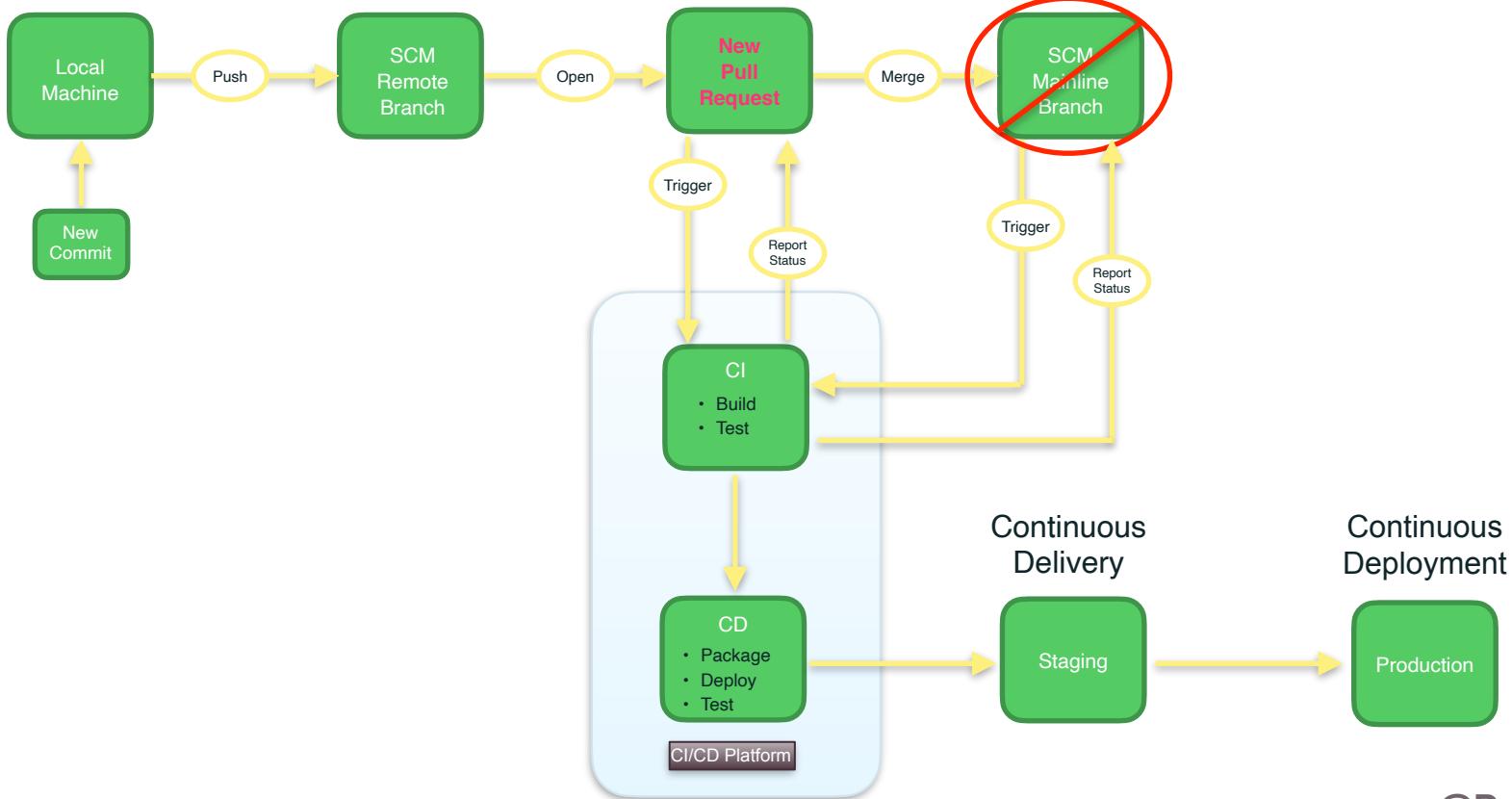
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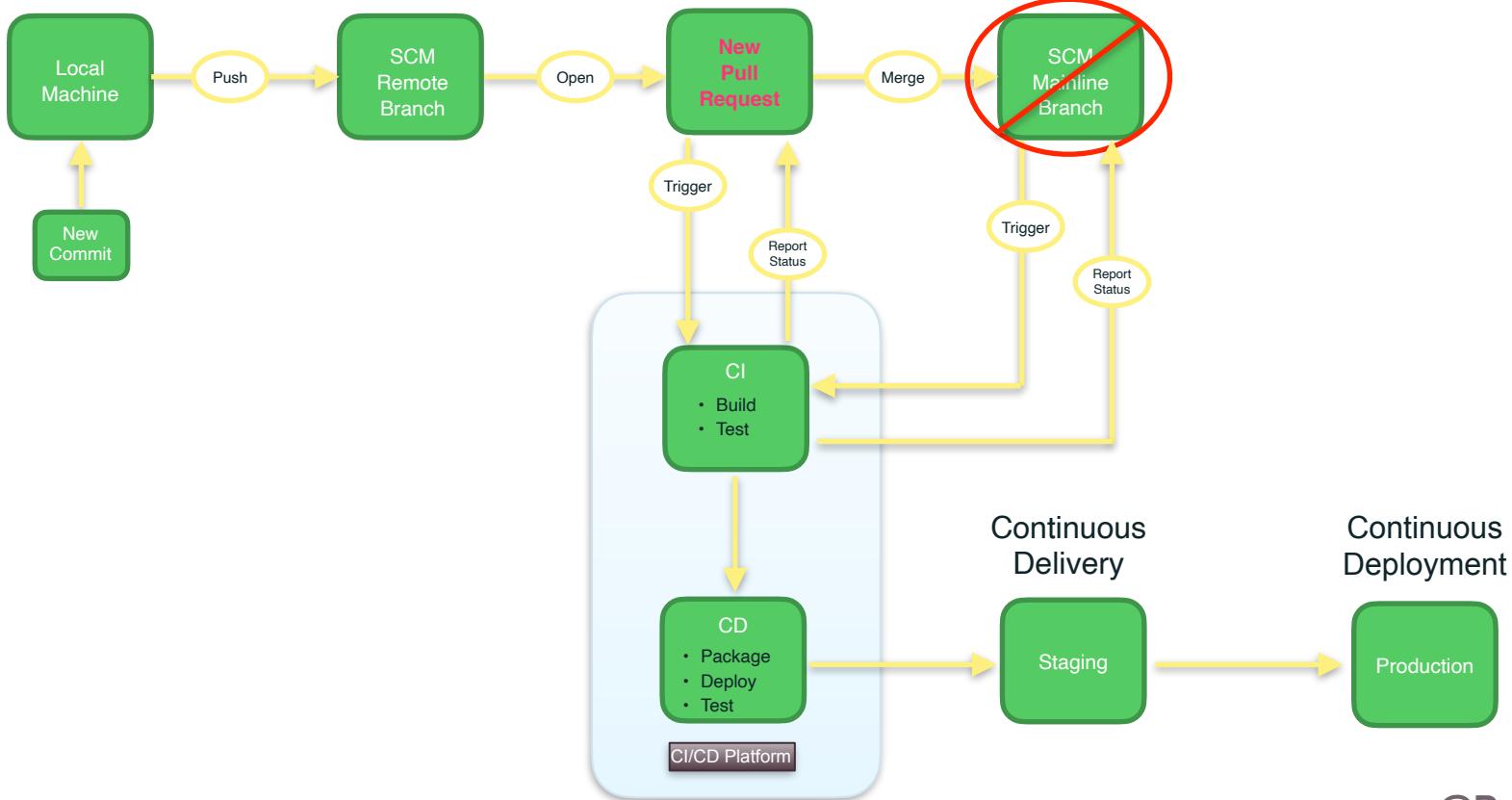
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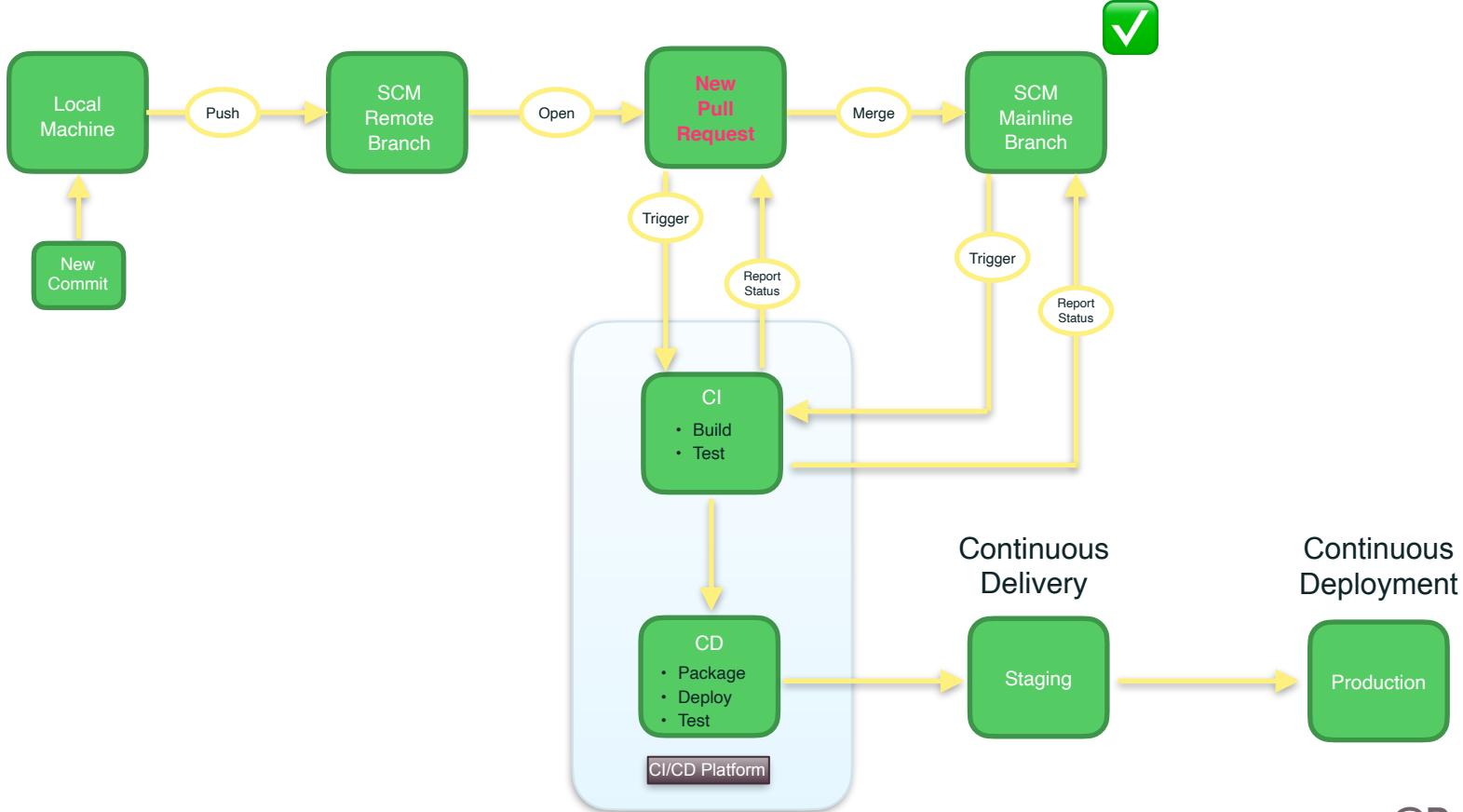
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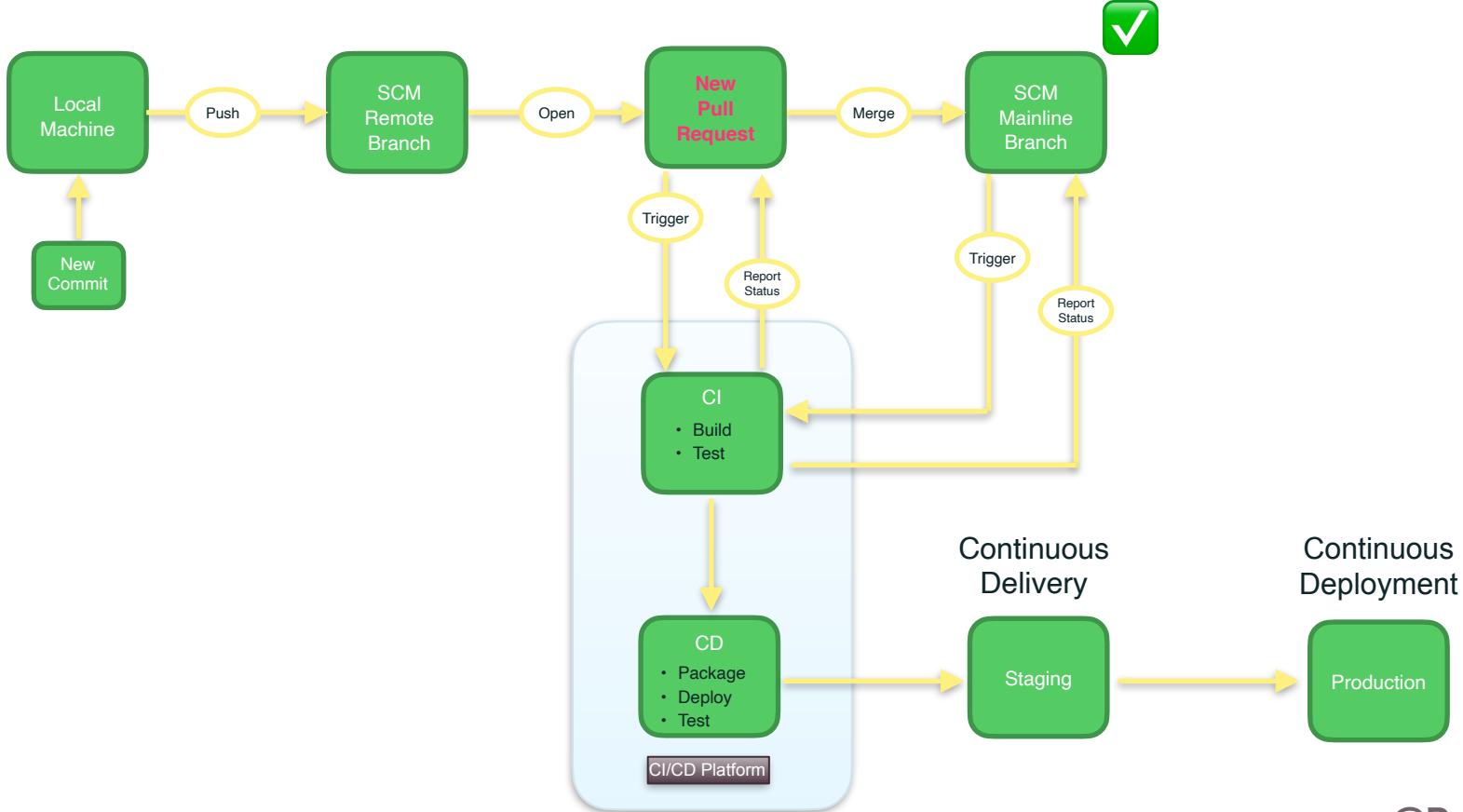
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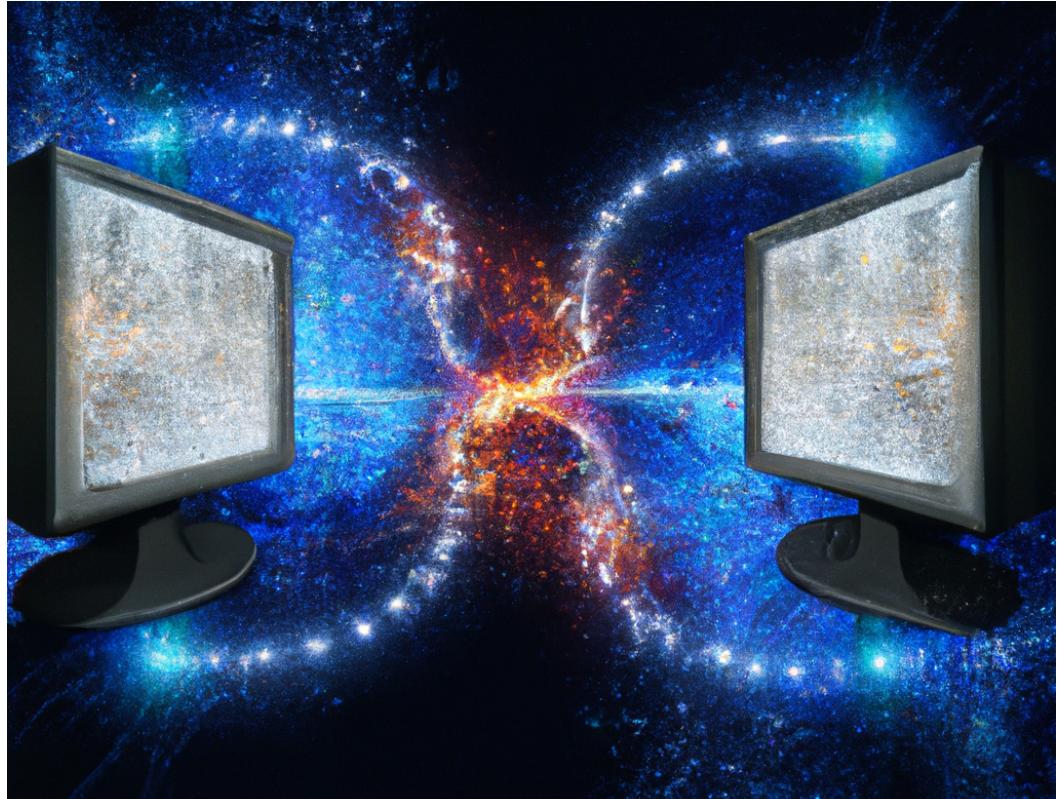
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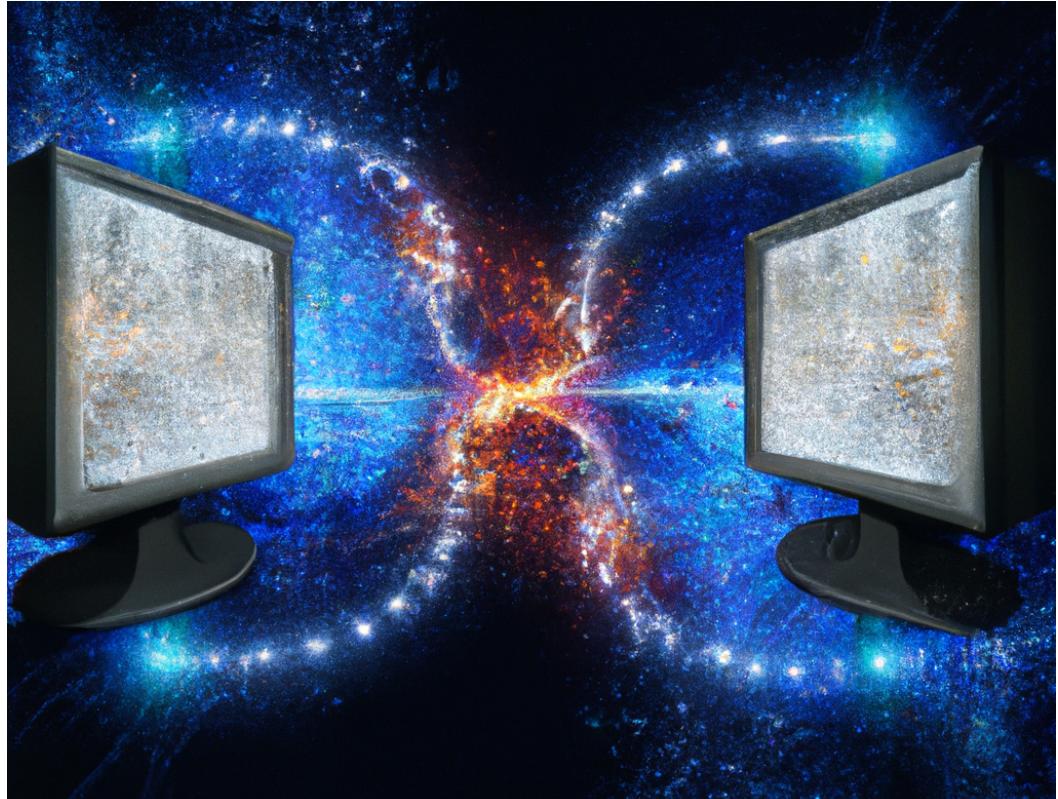


Bidirectional Communication



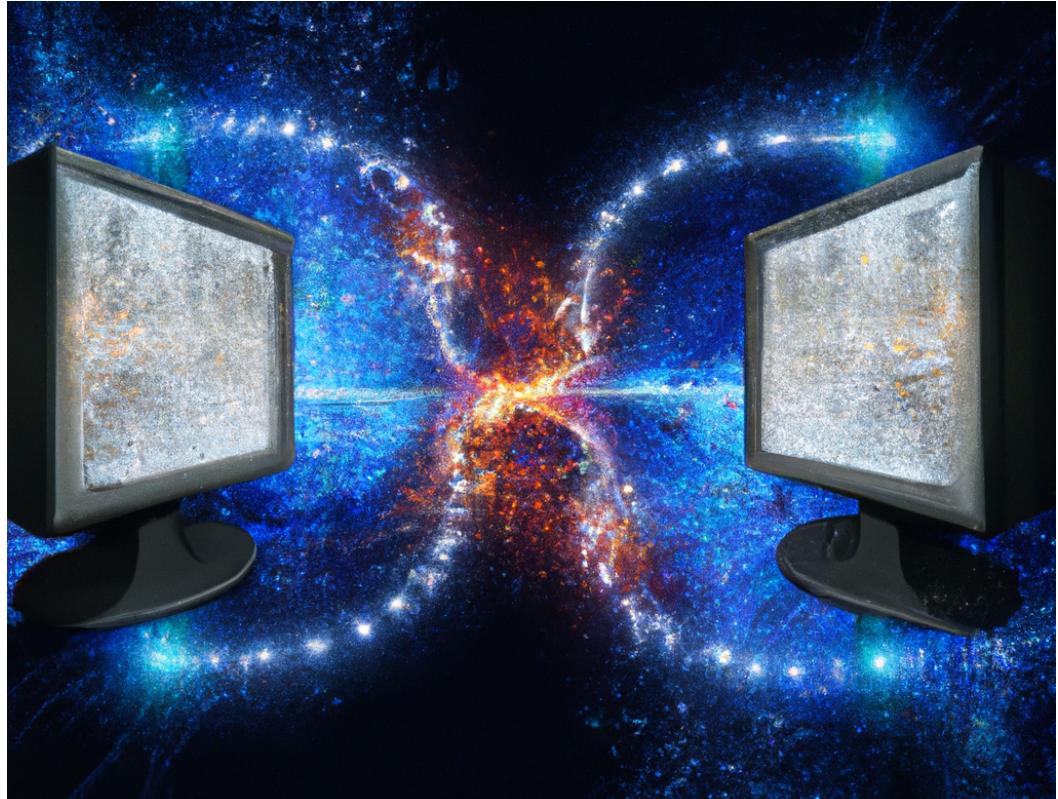
Bidirectional Communication

- Native integration



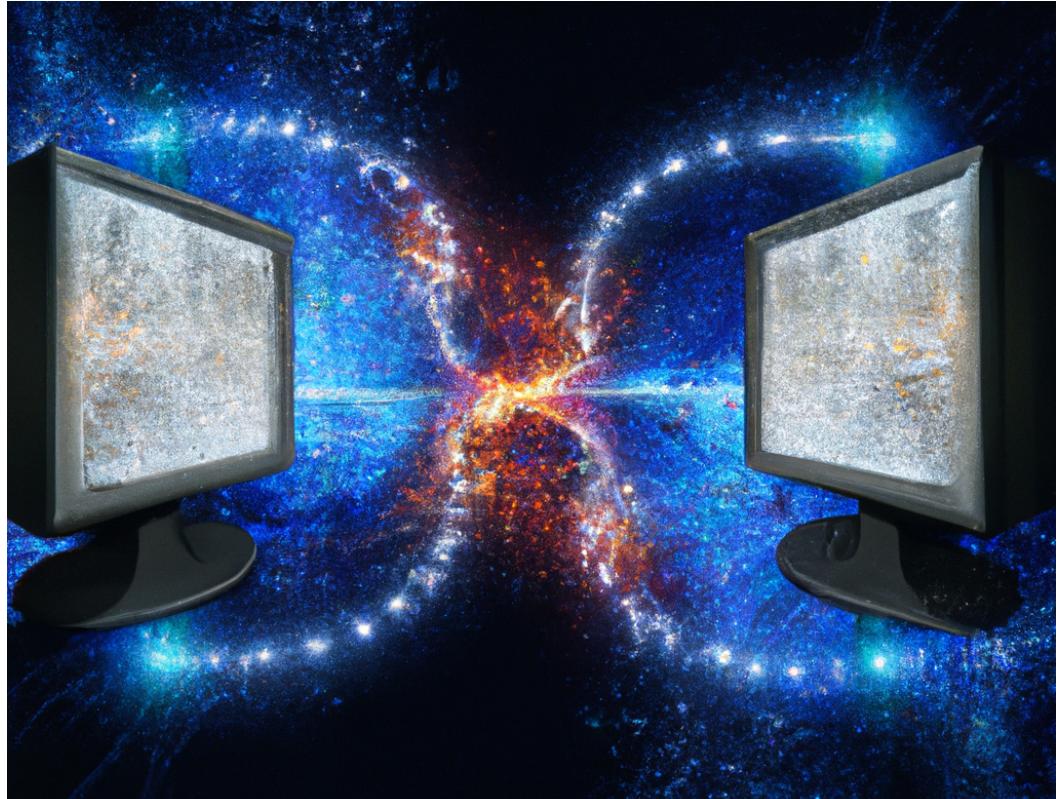
Bidirectional Communication

- Native integration
- Webhooks



Bidirectional Communication

- Native integration
- Webhooks
- Polling



Protect your branch



GitHub Repo Settings

Protect your branch



GitHub Repo Settings

- Require a pull request

Protect your branch



GitHub Repo Settings

- Require a pull request
- Require approvals

Protect your branch



GitHub Repo Settings

- Require a pull request
- Require approvals
- Require status checks to pass

Protect your branch



GitHub Repo Settings

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- Require status checks to pass
- Require branches to be up-to-date

Protect your branch



GitHub Repo Settings

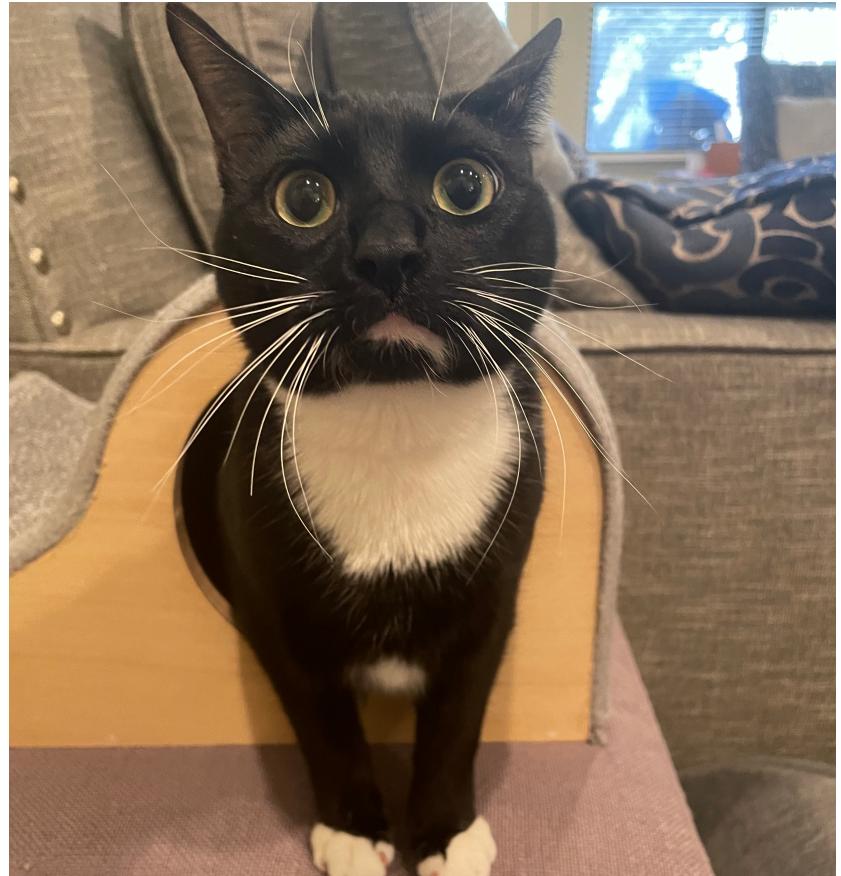
- Require a pull request
- Require approvals
- Require status checks to pass
- Require branches to be up-to-date
- Do not allow force pushes

GitHub Actions CI Script

```
name: CI
on:
  pull_request:
    branches:
      - main
  push:
    branches:
      - main

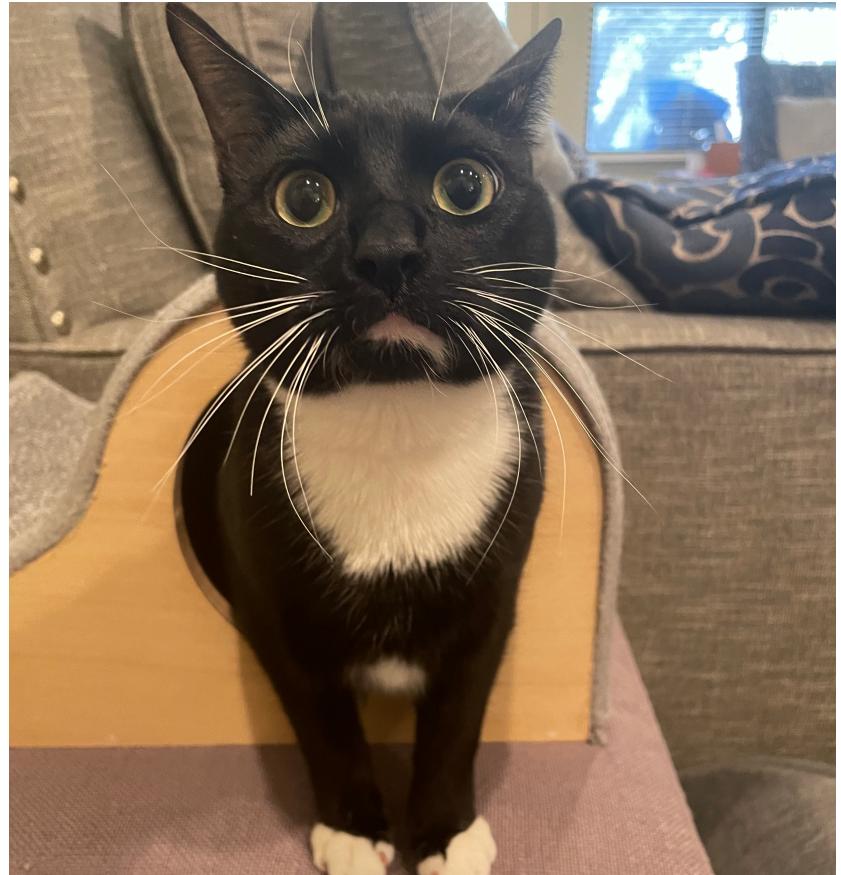
jobs:
  ci:
    runs-on: ubuntu-latest
    steps:
      - uses: actions/checkout@v2
      - uses: actions/setup-node@v2
        with:
          node-version: lts/*
          cache: 'npm'
      - run: npm ci
      - run: npm run build --if-present
      - run: npm test
```

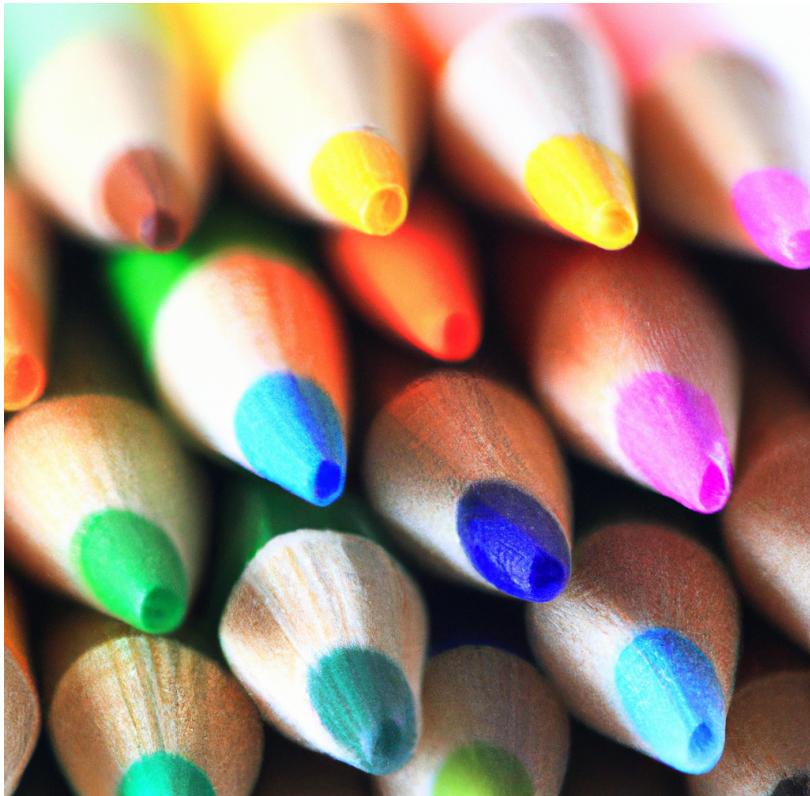




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I was told there was a demo!





Key Takeaways

- CI/CD defined
- Continuous delivery vs continuous deployment
- CI/CD benefits for you, the developer
- Rules for protecting your branch
- Demo - yay!

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Thank you



Thank you