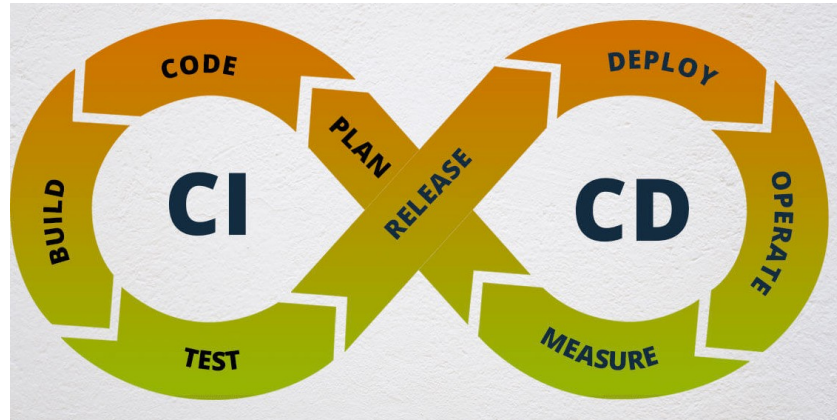


# CI/CD

Continuous Integration and Continuous Deployment



# What is CI/CD

1. CI: Continuous Integration
2. CD: Continuous Deployment

# 1. Continuous Integration

- The practice of merging all developers' working copies to a shared mainline several times a day. It's the process of "Making". Everything related to the code fits here, and it all culminates in the ultimate goal of CI: a high quality, deployable artifact! Some common CI-related phases might include:
  - Compile
  - Unit Test
  - Static Analysis
  - Dependency vulnerability testing
  - Store artifact

## 2. Continuous Deployment

- A software engineering approach in which the value is delivered frequently through automated deployments. Everything related to deploying the artifact fits here. It's the process of "Moving" the artifact from the shelf to the spotlight.

Some common CD-related phases might include:

- Creating infrastructure
- Provisioning servers
- Copying files
- Promoting to production
- Smoke Testing (aka Verify)
- Rollbacks

# Benefits of CI/CD

- Reduce Cost
- Avoid Cost
- Increase Revenue
- Protect Revenue

# Reduce Cost

- CI/CD can **Catch Compile Errors After Merge** => Less developer time on issues from new developer code.
- CI/CD can **Automate Infrastructure Cleanup** => Less infrastructure costs from unused resources.

# Avoid Cost

- CI/CD can **Catch Unit Test Failures** => Less bugs in production and less time in testing.
- CI/CD can **Detect Security Vulnerabilities** => Prevent embarrassing or costly security holes.
- CI/CD can **Automate Infrastructure Creation** => Less human error, Faster deployments.

# Increase Revenue

- CI/CD gives us **Faster and More Frequent Production Deployments**  
=>New value-generating features released more quickly.
- CI/CD allows us to **Deploy to Production Without Manual Checks** => Less time to market.



# Protect Revenue

- CI/CD can perform **Automated Smoke Tests** => Reduced downtime from a deploy-related crash or major bug.
- CI/CD can **Automate Rollback Triggered by Job Failure** => Quick undo to return production to working state.

# CI/CD Tools

- Jenkins
- Gitlab
- CircleCI
- VSTS(Microsoft)
- ...