

## Fundamentals and Benefits of CI/CD

**Continuous Integration (CI)** - it's the practice of merging all developers' working copies to a shared mainline several times a day. Everything related to the code fits here.

Some common CI-related phases might include:

- Compile
- Unit Test
- Static Analysis
- Dependency vulnerability testing
- Store artifact

**Continuous Deployment (CD)** – it's a software engineering approach in which the value is delivered frequently through automated deployments. Everything related to deploying the artifact fits here.

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

- Help catch compile errors after merge thus less developer time on issues from new developer code, this helps reduce cost.
- Helps catch unit test failures thus less bugs in production and less time in testing, this will help reduce cost.
- Helps detect security vulnerabilities thus prevent embarrassing or costly security holes, this will help avoid cost.
- Helps automate infrastructure creation thus less human error and faster deployments, this will help avoid cost.
- Automate infrastructure cleanup thus less infrastructure costs from unused resources, this will help reduce cost.
- Faster and more frequent production deployments thus new value-generating features released more quickly, this will help increase revenue.
- Deploy to production without manual checks thus less time to market, this will help increase revenue.
- Automated smoke tests thus reduced downtime from a deploy-related crash or major bug, this will help protect revenue.
- Automated rollback triggered by job failure thus quick undo to return production to working state, this will help protect revenue.