CI/CD: Fundamentals and Benefits

Overview

- What is CI/CD?
- Benefits from CI/CI
- Cost efectiveness

What is CI/CD?

- CI/CD consist of 3 concepts
  - Continuous Integration (CI) involves merging developer branches into the main branch multiple times a day. It focuses on test automation and aims to produce a high-quality, deployable artifact.
  - Continuous Delivery ensures fast, automated, and on-demand release of software changes to customers.
  - Continuous Deployment enables frequent and automated deployments without human intervention. It includes phases like infrastructure provisioning, smoke testing, production deployments, and automated rollbacks.

Benefits from CI/CI

- Faster and more frequent releases:
  - Automates the software development lifecycle, enabling faster and frequent releases for delivering new features, bug fixes, and improvements to users promptly.
- Early detection of issues:
  - Regularly builds and tests code changes, enabling early bug detection and resolution.
- Improved code quality:
  - Promotes frequent, small commits, triggering automated tests to maintain code quality and prevent regressions or conflicts.

Benefits from CI/CI

- Collaboration and team efficiency:
  - Collaboration between developers, testers, and operations teams, breaking down silos and improving efficiency.
- Risk reduction:
  - Automating build, test, and deployment processes, ensure consistency and reduce deployment-related errors.
- Faster time to market:
  - Enables rapid and frequent deployments, allowing businesses to quickly deliver new features and updates to users.
- Continuous feedback loop:
  - Continuous feedback from testing, monitoring, and user input. This supports iterative improvement, feature iteration, and data-driven decision-making in future development.

Cost effectiveness

- Businesses can protect their revenue by:
  - Delivering high-quality releases faster
  - Reducing the likelihood of revenue-impacting bugs
  - Ensuring stable and reliable services
  - Responding effectively to issues or failures through continuous monitoring and recovery mechanisms.

Cost effectiveness

- Reduce costs by:
  - **Reduce** likelihood that any **bugs or errors** slip through the cracks and cause problems down the line
  - **Eliminating** many of the **costs** incurred while **building and testing** code changes
  - Teams spend less time on testing and bug fixes => **meaning organizations spend less money on tasks**
  - CI/CD also makes it easier to deliver high-quality products to market faster **=> organizations stand to see an increase in profits. Customers stick around longer and will likely recommend your products to others in their network**