Fundamentals of DevOps

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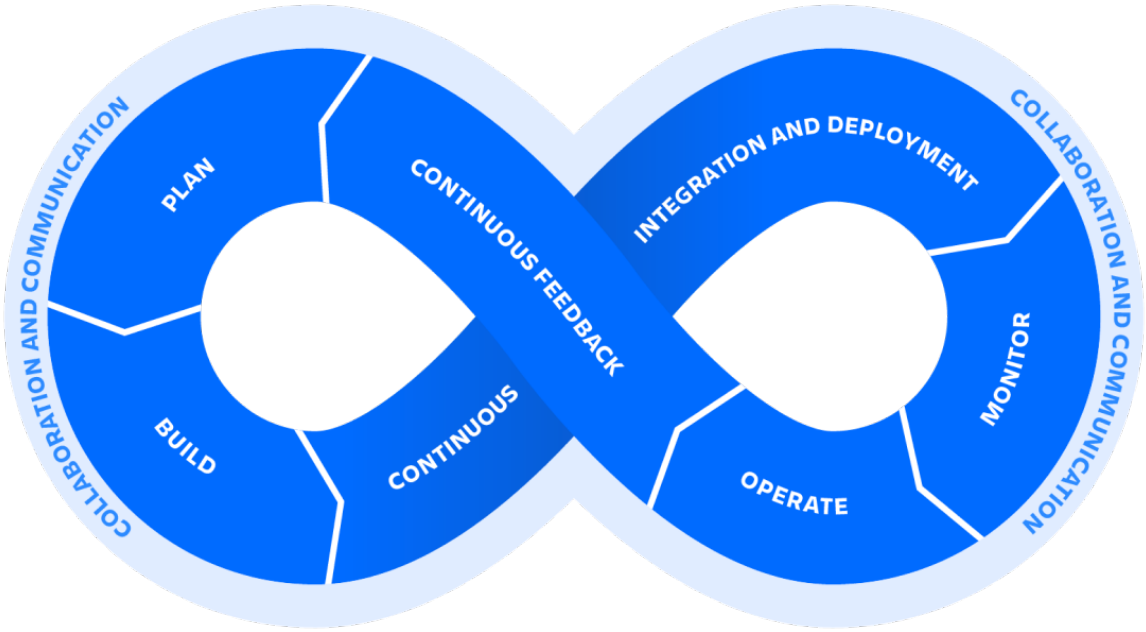
What is DevOps ?

DevOps is a set of practices, tools, and a cultural_philosophy that automate and integrate the processes between software development and IT teams. It emphasizes team empowerment, cross-team communication and collaboration, and technology automation.

How DevOps works ?

DevOps teams use tools to automate and accelerate processes, which helps to increase reliability. A DevOps tool chain helps teams tackle important DevOps fundamentals including continuous integration, continuous delivery, automation, and collaboration.

DevOps Lifecycle ?



- Plan: DevOps teams should adopt agile practices to improve speed and quality. Agile is an iterative approach to project management and software development that helps teams break work into smaller pieces to deliver incremental value.

- Build: Git is a free and open source version control system. It offers excellent support for branching, merging, and rewriting repository history, which has led to many innovative and powerful workflows and tools for the development build process.

- Continuous integration and delivery: CI/CD allows teams to release quality products frequently and predictably, from source code repository to production with automated workflows. Teams can merge code changes frequently, deploy feature flags, and incorporate end-to-end testing.

- Monitor and alert: Quickly identify and resolve issues that impact product up-time, speed, and functionality. Automatically notify your team of changes, high-risk actions, or failures, so you can keep services on.

- Operate: Manage the end-to-end delivery of IT services to customers. This includes the practices involved in design, implementation, configuration, deployment, and maintenance of all IT infrastructure that supports an organization’s services.

- Continuous feedback: DevOps teams should evaluate each release and generate reports to improve future releases. By gathering continuous feedback, teams can improve their processes and incorporate customer feedback to improve the next release.

How DevOps works ?

- Speed: Teams that practice DevOps release deliverable more frequently, with higher quality and stability. Continuous delivery allows teams to build, test, and deliver software with automated tools.

- Improved collaboration: This makes teams more efficient and saves time related to work hand-offs and creating code that is designed for the environment where it runs.

- Rapid Delivery: Frequently release the working product in the market to satisfy the market and more importantly customer's need, which improves the ROI (Return on investment).

- Reliability: By following DevOps best practices and using the best tool for Continuous Integration, Testing Automation, and Continuous Delivery, and monitoring the logs helps the team to stay updated and take the real-time decision quickly.

- Security: While implementing automation Security is a very important factor, By Following the DevOps model and using Infrastructure as code and by doing automation of process and compliance policies, one can take control of security configuration.

- Software Quality: Extensive collaboration between the activities such as product development and the operation teams and frequent collection of customer feedback may leads to a significant improvement in the overall quality of the product.

Translating technical benefits into benefits for the company?

Technical Language	Value	Translation
Catch Compile Errors After Merge	Reduce Cost	Less developer time on issues from new developer code
Catch Unit Test Failures	Avoid Cost	Less bugs in production and less time in testing
Detect Security Vulnerabilities	Avoid Cost	Prevent embarrassing or costly security holes
Automate Infrastructure Creation	Avoid Cost	Less human error, Faster deployments
Automate Infrastructure Cleanup	Reduce Cost	Less infrastructure costs from unused resources
Faster and More Frequent Production Deployments	Increase Revenue	New value-generating features released more quickly
Deploy to Production Without Manual Checks	Increase Revenue	Less time to market
Automated Smoke Tests	Protect Revenue	Reduced downtime from a deploy-related crash or major bug
Automated Rollback Triggered by Job Failure	Protect Revenue	Quick undo to return production to working state

Use Case

Functions	Previous Time Frame	Present Time Frame	DevOps Benefit
Project initiation	10 days	2 days	80% faster
Overall time to development	55 days	3 days	94% faster
Build verification test availability	18 hours	< 1 hour	94% faster
Overall time to production	3 days	2 days	33% faster
Time between releases	12 months	3 months	75% faster