From Code to Cloud: DevOps Pipelines

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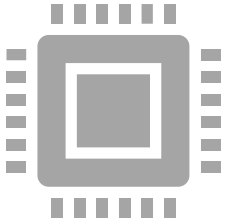
What is DevOps

Bridging the Gap Between Development and Operations



It is set of best practices that combines both Software Development(Dev) and IT Operations(Ops)

It also delivers high quality in short development cycle

Why DevOps

Challenges in Traditional Software Development:

Slow release cycles

Lack of collaboration between teams

High failure rates in deployments

Benefits of DevOps:

Faster time to market

Improved collaboration and communication

Higher quality and reliability of software

How DevOps Solves the Problem

Continuous Integration (CI):

Regularly integrating code changes into a shared repository

Automated testing to detect issues early

Continuous Deployment (CD):

Automated deployment of code to production

Reducing manual intervention and errors

Infrastructure as Code (IaC):

Managing and provisioning infrastructure through code

Ensuring consistency and repeatability

Tools Involved in DevOps

- **Version Control**: Git, GitHub
- **CI/CD**: Github Actions, Jenkins, Travis CI, CircleCI, ArgoCD
- **Configuration Management**: Terraform, Ansible, Puppet, Chef
- **Containerization**: Docker, Kubernetes
- **Monitoring and Logging**: Grafana,Loki,Prometheus, ELK Stack (Elasticsearch, Logstash, Kibana)

Impact of DevOps

On Development Teams:

Increased productivity and efficiency

Better quality of code and fewer bugs

On Operations Teams:

More stable and reliable systems

Faster recovery from failures

On Business:

Faster delivery of features and updates

Higher customer satisfaction

Case Study - OpenAI

- We’ve scaled Kubernetes clusters to 7,500 nodes, producing a scalable infrastructure for large models like GPT-3(opens in a new window), CLIP, and DALL·E, but also for rapid small-scale iterative research such as Scaling Laws for Neural Language Models(opens in a new window).
- We’ve found Kubernetes to be an exceptionally flexible platform for our research needs. It has the ability to scale up to meet the most demanding workloads we’ve put on it. There are many areas yet though where it needs improvement, and the Supercomputing team at OpenAI will continue to explore how Kubernetes can scale. If this kind of work seems interesting, you should consider applying at OpenAI!

References:

- https://openai.com/index/scaling-kubernetes-to-7500-nodes/
- https://kubernetes.io/case-studies/openai/

Conclusion

DevOps is essential for modern software development

It fosters collaboration, automation, and continuous improvement

Q&A

Floor is open for any questions from the audience