

DevOps

Software Architecture

Brae Webb

March 25, 2025

Question

Who has heard of *DevOps*?

Question

Who has used *DevOps*?

The larger story

Server Config Config Management

Application Config Config Files

Provisioning Infrastructure Code

Building Continuous Integration

Deployment Continuous Deployment

Testing Automated Tests

Database Administration Schema Migration

Specifications Behaviour Driven Development

Question

What is *DevOps*?



What is *DevOps*? [Senapathi et al., 2018]

- A combination of *software development* and *IT operations* skills

What is *DevOps*? [Senapathi et al., 2018]

- A combination of *software development* and *IT operations* skills
- A *cultural movement* that enables rapid development with four defining characteristics: open communication, incentive and responsibility alignment, respect, and trust

Important

Continuous *

Also Important

If it hurts, do it more often



Tooling

1. Continuous *development*
2. Continuous *integration*
3. Continuous *testing*
4. Continuous *deployment*
5. Continuous *operations*
6. Continuous *monitoring*
7. Continuous *feedback*

Small Group Discussion

Describe the tools you have identified for the Continuous * practices.

Class Discussion

Summarise the tools identified by each group and the practices they support.



Today

Design a DevOps pipeline for *Sahara*







Sahara Pipeline

1. What *types of tools* would be required?

Sahara Pipeline

1. What *types of tools* would be required?
2. Which *specific tools* would you choose?

Sahara Pipeline

1. What *types of tools* would be required?
2. Which *specific tools* would you choose?
3. On which type of *computing infrastructure* would you deliver the system?

Sahara Pipeline

1. What *types of tools* would be required?
2. Which *specific tools* would you choose?
3. On which type of *computing infrastructure* would you deliver the system?
4. What parts of the deployment and operations processes could be *automated*?

Discussion

Present the DevOps pipelines that you have developed to the rest of the class.

Challenge 1: DevOps in Practice

Do the seven necessary *DevOps practices* map perfectly to the *enablers* in the article by Senapathi et al ^[Senapathi et al., 2018]?

Technological Enablers

- *Build* automation
- *Test* automation
- *Deployment* automation
- *Monitoring* automation
- *Recovery* automation
- *Infrastructure* automation
- *Configuration* management for code and infrastructure
- *Metrics* automation

References

- [Senapathi et al., 2018] Senapathi, M., Buchan, J., and Osman, H. (2018).
DevOps capabilities, practices, and challenges: Insights from a case study.
In *Proceedings of the 22nd International Conference on evaluation and
assessment in software engineering 2018*, volume 137700 of *EASE'18*, pages
57–67. ACM.