# DevOps

 $Software\ Architecture$ 

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### Question

Who has heard of *DevOps*?

### Question

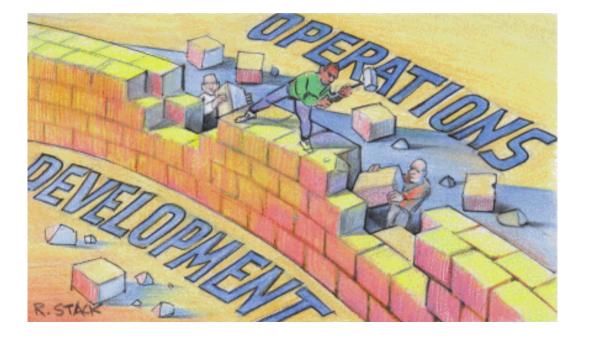
Who has used DevOps?

# 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?



 $What \ is \ DevOps? {\it [Senapathi\ et\ al.,\ 2018]}$ 

• A combination of software development and IT operations skills

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

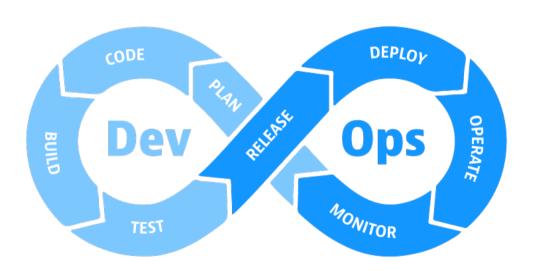
- A combination of software development and IT operations skills
- A *cultural movement* that enables rapid development with four defining characteristics: open communication, incentive and responsibility alignment, respect, and trust

# Important

Continuous \*

# Also Important

If it hurts, do it more often



# Tooling

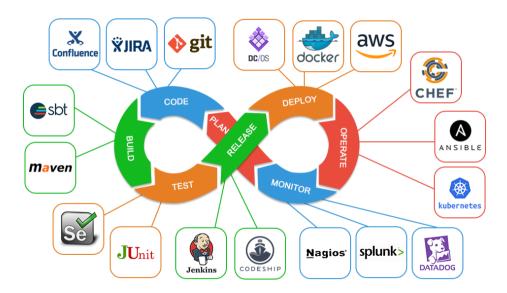
- 1. Continuous development
- 2. Continuous integration
- 3. Continuous *testing*
- 4. Continuous deployment
- 5. Continuous *operations*
- 6. Continuous monitoring
- 7. Continuous feedback

### Small Group Discussion

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

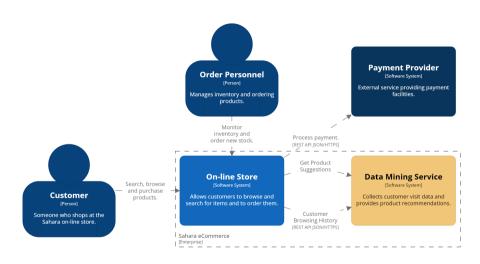
### Class Discussion

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

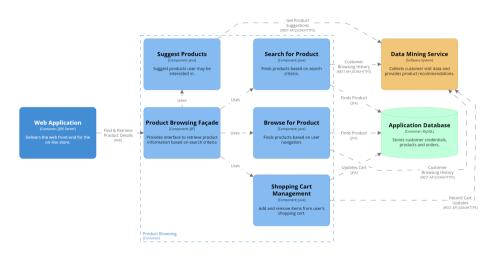


# Today

Design a DevOps pipeline for *Sahara* 



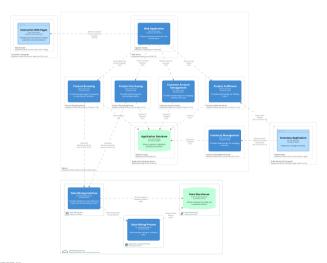
#### [System Context] On-line Store



#### [Component] On-line Store - Product Browsing

Sunday, 20 March 2022, 21:51 Australian Eastern Standard Time





### Sahara Pipeline

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- 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 [Senapathi et al]?

# 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.