DevOps

Software Architecture

Brae Webb

March 21, 2024

Question

Who has heard of *DevOps*?

Question

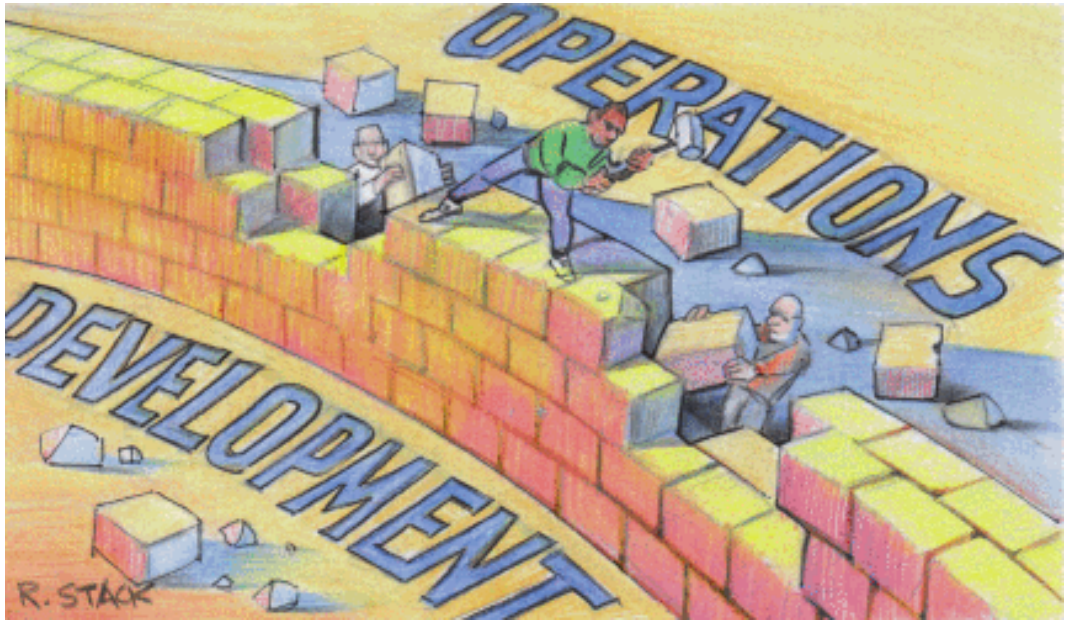
Who has used *DevOps*?

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*?


OPERATIONS
DEVELOPMENT
R. STACK

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

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

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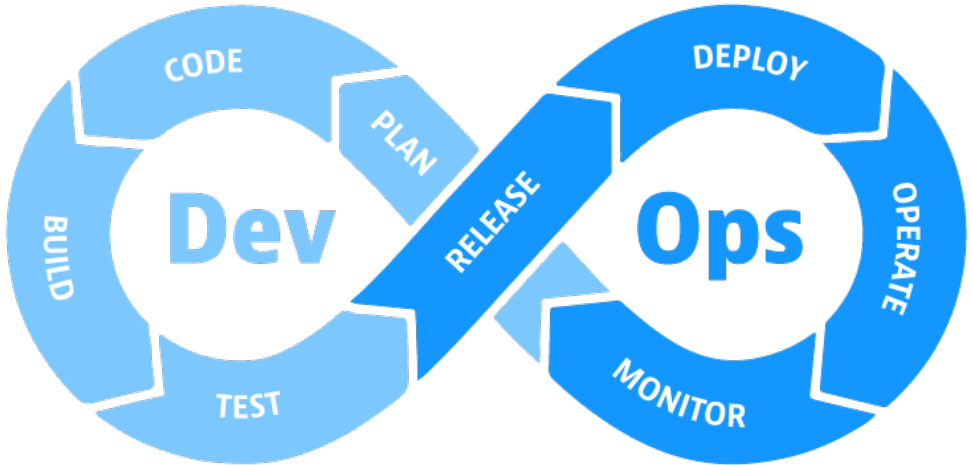
- A combination of *software development* and *IT operations* skills
- A *cultural movement* that enables rapid development with four defining characteristics: open communication, incentive and responsibility alignment, respect, and trust

Important

Continuous *

Also Important

If it hurts, do it more often


CODE
PLAN
BUILD
Dev
TEST
RELEASE
DEPLOY
OPERATE
Ops
MONITOR

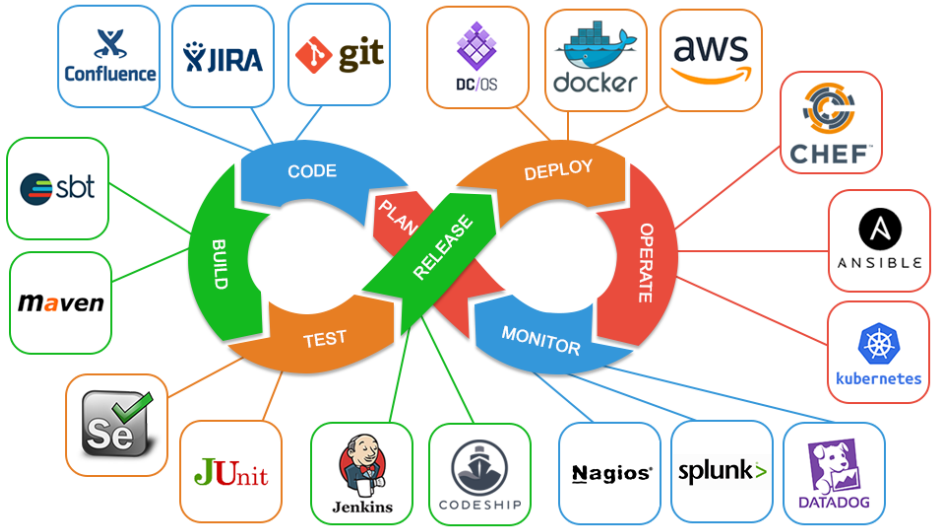
1. Continuous *development*
2. Continuous *integration*
3. Continuous *testing*
4. Continuous *deployment*
5. Continuous *operations*
6. Continuous *monitoring*
7. Continuous *feedback*

Small Group Discussion

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

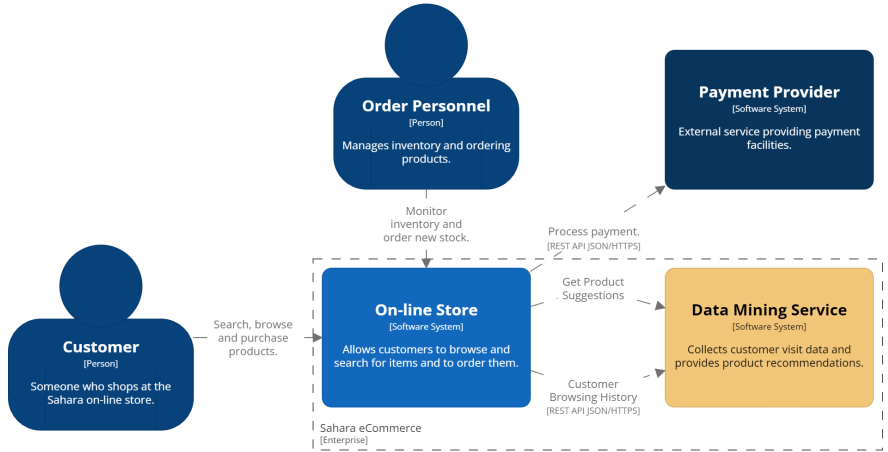
Class Discussion

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


Confluence
JIRA
git
DC/OS
docker
aws
CHEF
ANSIBLE
kubernetes
sbt
maven
Se
JUnit
Jenkins
CODESHIP
Nagios
splunk>
DATADOG
CODE
BUILD
TEST
PLAN
RELEASE
DEPLOY
OPERATE
MONITOR

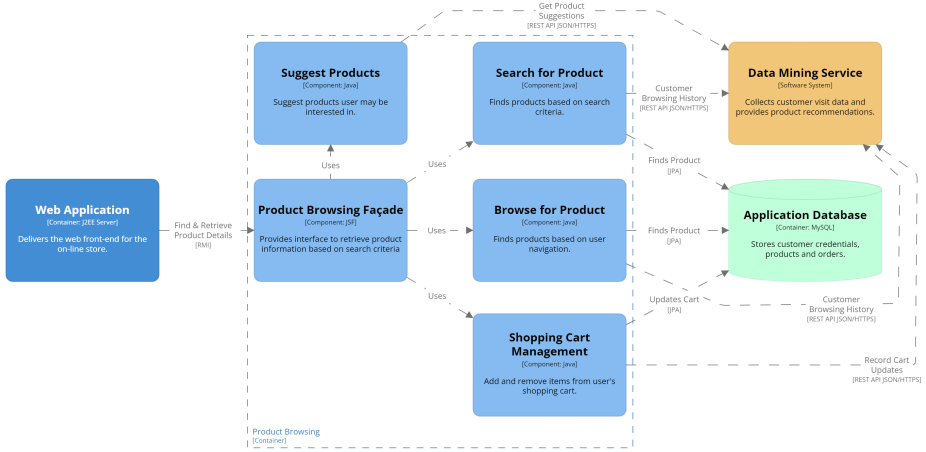
Today

Design a DevOps pipeline for *Sahara*



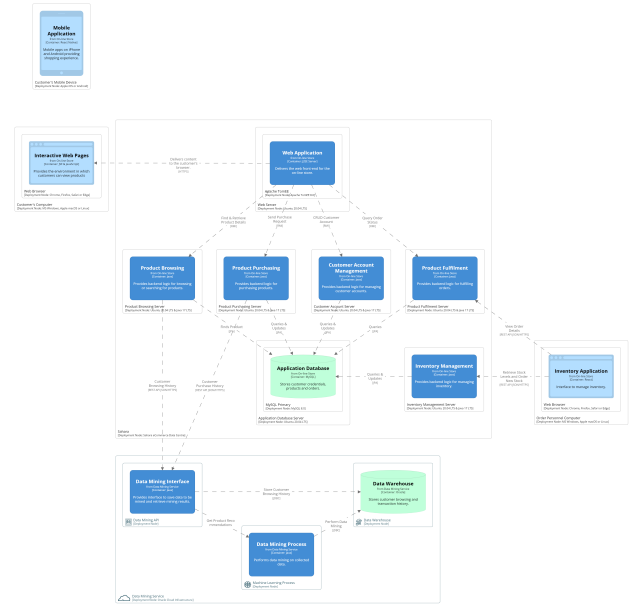
[System Context] On-line Store

Friday, 18 March 2022, 23:38 Australian Eastern Standard Time



[Component] On-line Store - Product Browsing

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



[Deployment] - Live

Friday, 16 May 2025, 12:00 Australian Eastern Standard Time

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

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2. Which *specific tools* would you choose?

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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.