Cloud Computing (Where it fits in?)

ECE 4150

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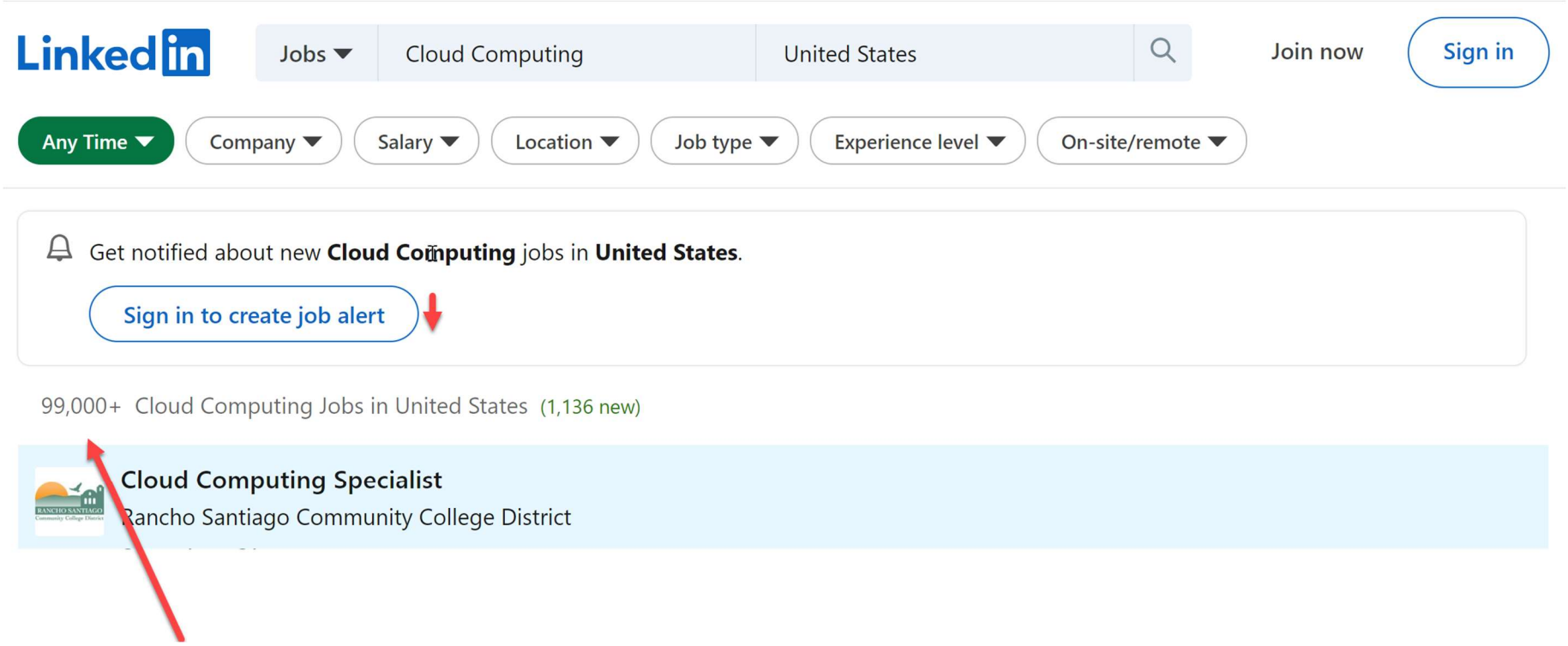
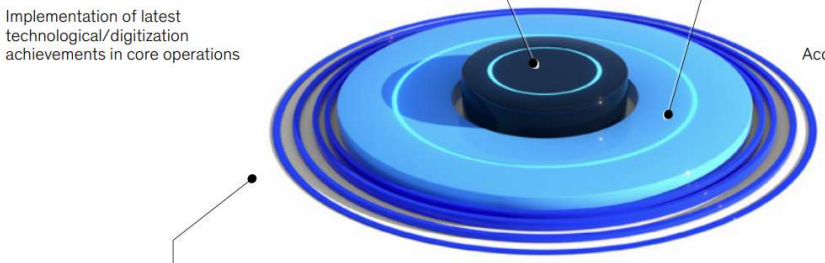
Vijay Madisetti

Cloud Computing Skills are in demand!



Cloud Computing Value



1. Rejuvenate

$430 billion

IT cost optimization

Cost optimization of application development and maintenance and IT infrastructure

Risk reduction

Improved business resilience of the organization

Core-operations digitization

Implementation of latest technological/digitization achievements in core operations

2. Innovate

$770 billion

Innovation-driven growth

Business growth from new and enhanced use cases in analytics, IoT, and automation

Accelerated product development

Enhancement of operating-model agility, ease of cloud configuration, and democratized access to computational power

Hyper-scalability

Access to instant on-demand elasticity in compute and storage capacity to scale across customer segments, geographies, and channels

3. Pioneer

Additional opportunity

Early adoption of cloud technology

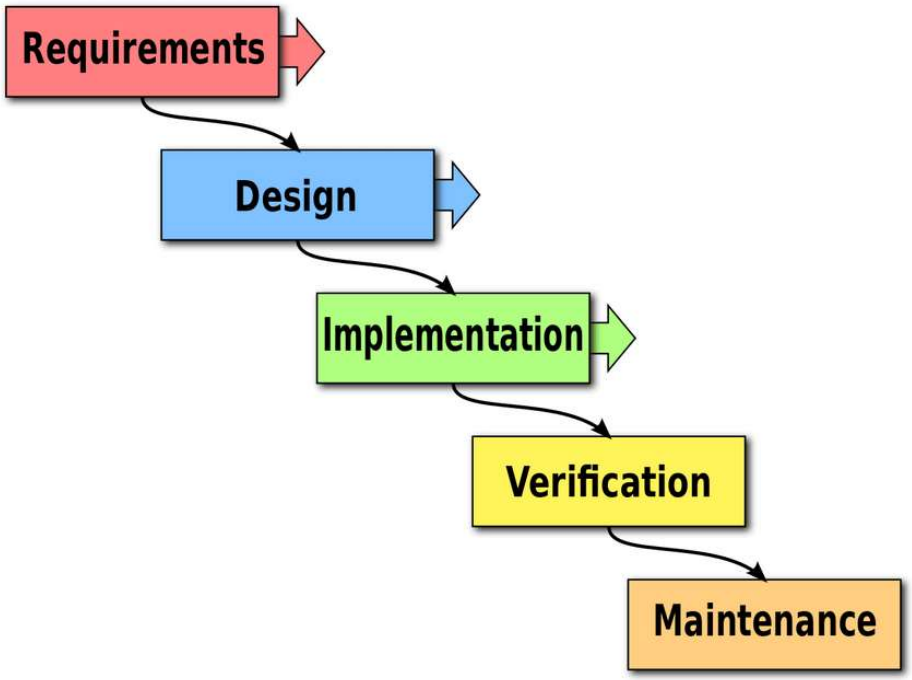
Embracing culture of experimentation with low cost of failure and gaining experience in cloud technology, which is an enabler for early adoption of future tech such as quantum computing, AR/VR/MR (mixed reality), blockchain, and 3-D/4-D printing

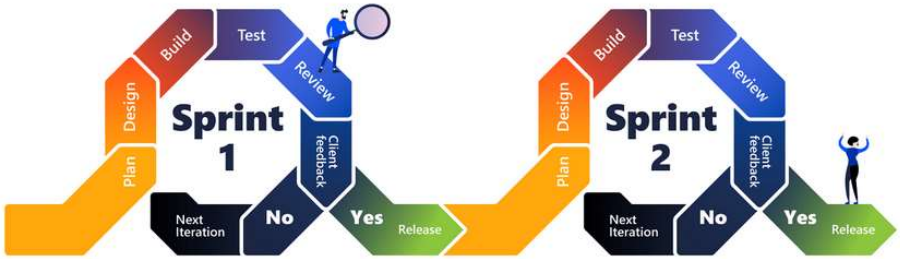
Source: Independent third-party research data (OmnicomGroup and Known), industry and McKinsey expert interviews, McKinsey D2020 IT cost benchmarking, McKinsey Global Institute research, team analysis

Outline

- Introduction to DevSecOps
- Building blocks within DevSecOps
- Tools used within DevSecOps
- Benefits of DevSecOps
- Top Security Threats in 2021/2022

Waterfall v. Agile Development Processes



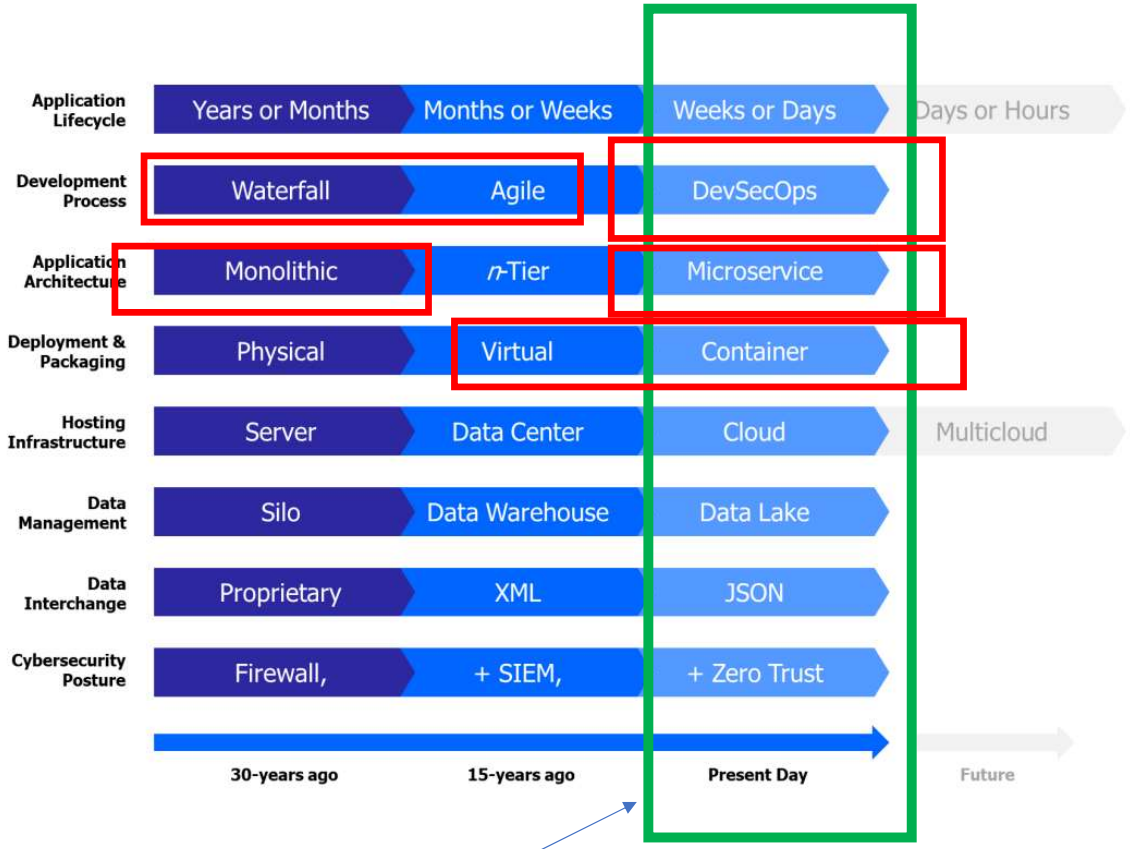


Waterfall v. Agile

	Waterfall	Agile
Implementation	Linear	Iterative
Timescale of detailed plans	Entire project	Typically 2–8 weeks
Stakeholder engagement	Mostly upfront	Throughout entire project
Team structure	Traditional hierarchy	Often more self-organized
Main benefit	Predictable, reliable outcome, and controlled process	Flexibility to adapt to rapidly changing markets

Enterprise Software consists of Numerous Application Lifecycles

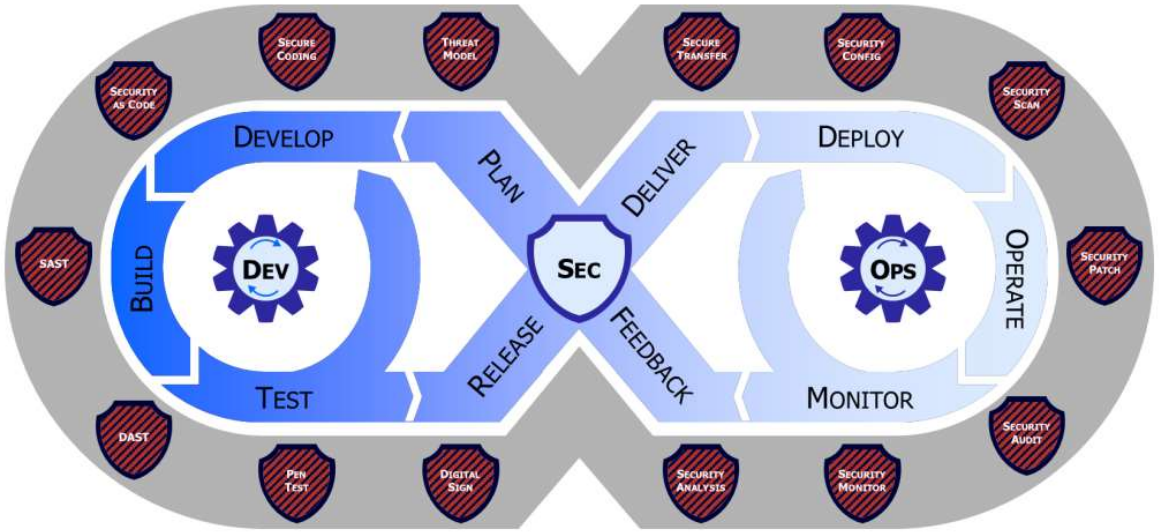
Evolution of Enterprise Software



Cloud Computing meets this requirement

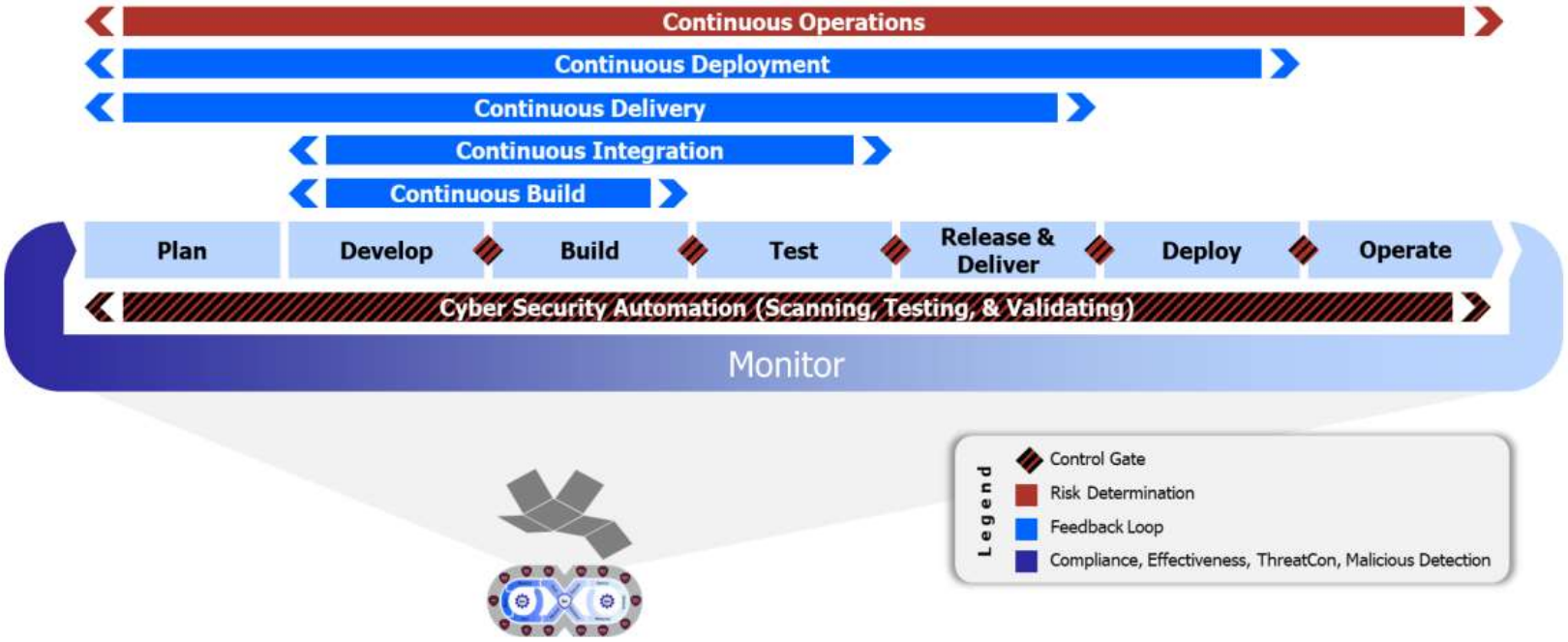
Benefits of DevSecOps (from cloud computing)

- **Reduced mean-time to production**: Reduces the average time it takes from when new software features are required until they are running in production;
- **Increased deployment frequency**: Increases how often a new release can be deployed into the production environment;
- **Decreased mean-time to recovery:** Decreases the average time it takes to identify and resolve an issue after a production deployment;
- **Decreased change-fail rate:** Decreases the probability that a new feature delivered in production will result in a failure in operations;
- **Fully automated risk management**: Well defined control gates perform risk characterization, monitoring, and mitigation as artifacts are released and promoted through every step, from ideation through production;
- **Baked-in Cybersecurity:** Software updates and patches delivered *at the speed of relevance*.

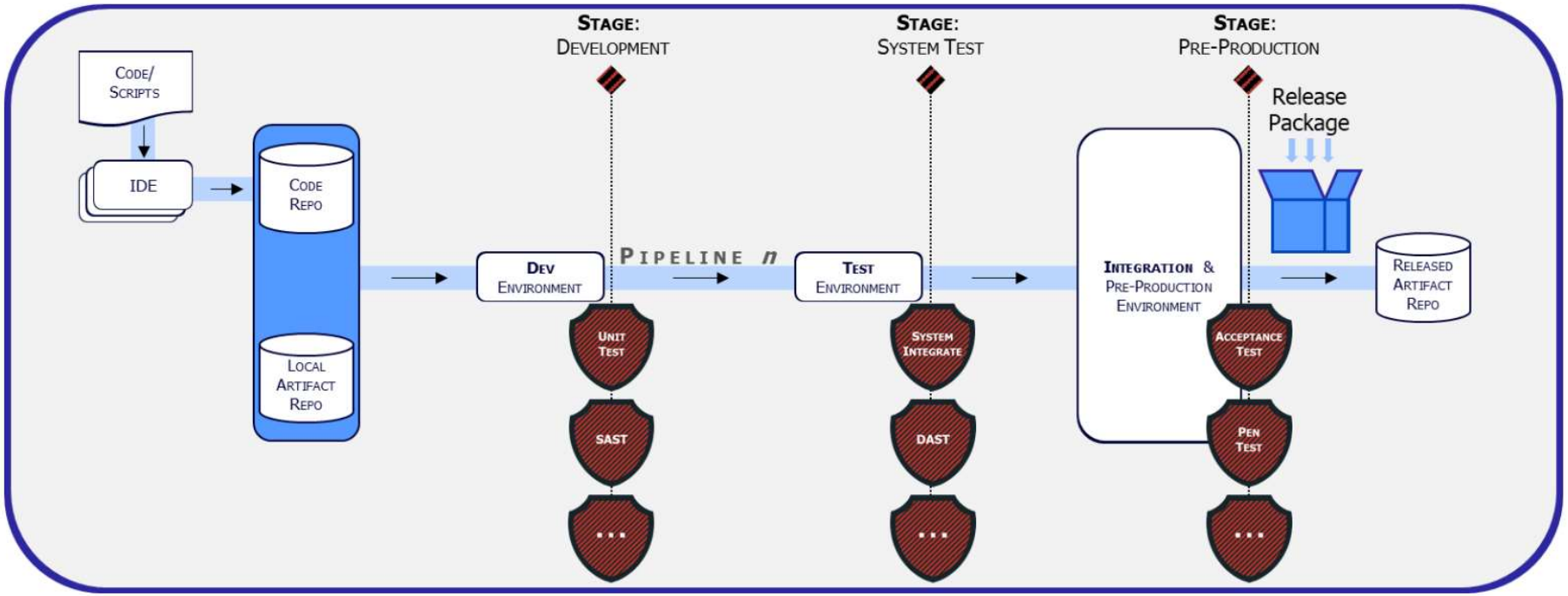


- How DevSecOps is represented in Popular Press

Digging Deeper into the Diagram



Concept of a Software Factory



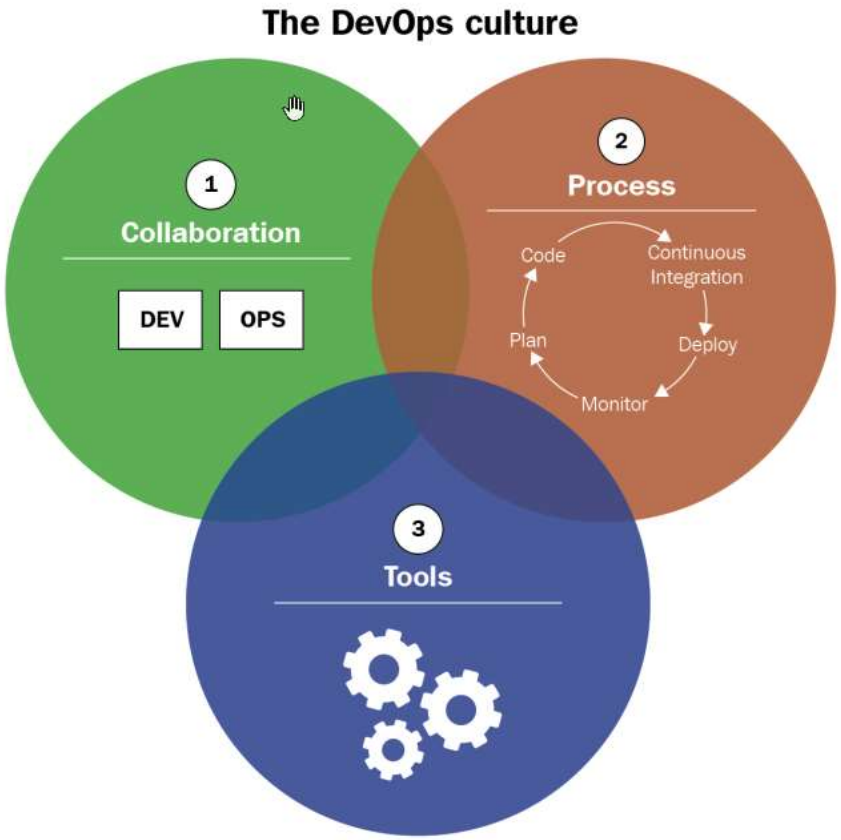
Goal of DevSecOps & Software Factories

SECURE SOFTWARE DETECTS AND RESISTS CYBERATTACKS, OFFERING THE WARFIGHTER A QUANTIFIED DEGREE OF CYBER SURVIVABILITY

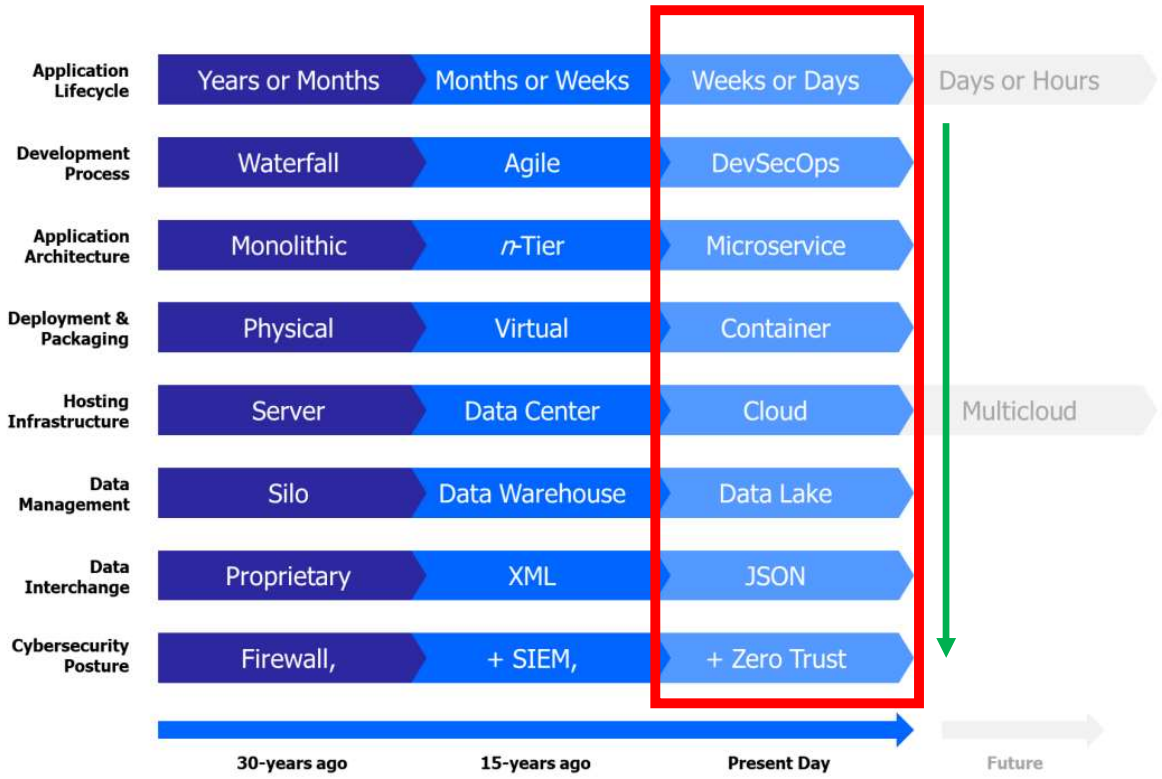
STABLE SOFTWARE PERFORMS WELL WITHOUT BREAKING OR CRASHING, & DYNAMICALLY SCALES TO MATCH DEMAND

QUALITY SOFTWARE MAXIMIZES USER REQUESTED FEATURE SETS AND MINIMIZES FUNCTIONAL DEFECTS

DevOps Culture (no Security yet)



DevSecOps builds on Microservices, Containers, Cloud and Zero-Trust…..



Summary

- You now know Enterprise & Cloud Software Security Problems at a high-level.
- You now know how DevSecOps can play a role in developing high quality, secure and resilient software factories
- You have seen what is inside the DevSecOps flow
- You had a quick view as to what tools and processes occur with DevSecOps

- ***What's Next?***
- *Next few classes will go into further details on cloud, server-less applications, microservices, containers, version control, DevOps and security aspects – how cloud software is developed, tested, & deployed in secure manner*