DevOps Essentials

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Welcome to the deep dive into Azure

Expectations

- Ask questions
- Be Vocal
- Assist your colleagues
- Research and do labs as much as possible.

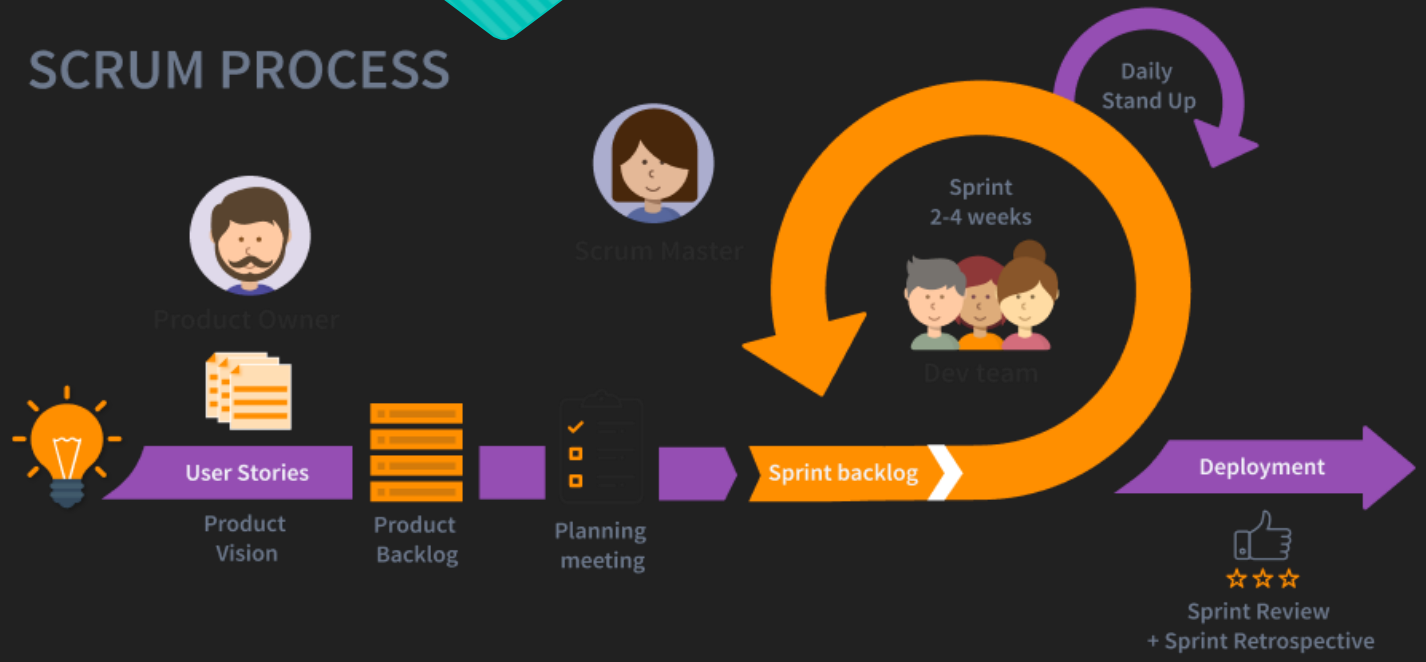
What is DevOps

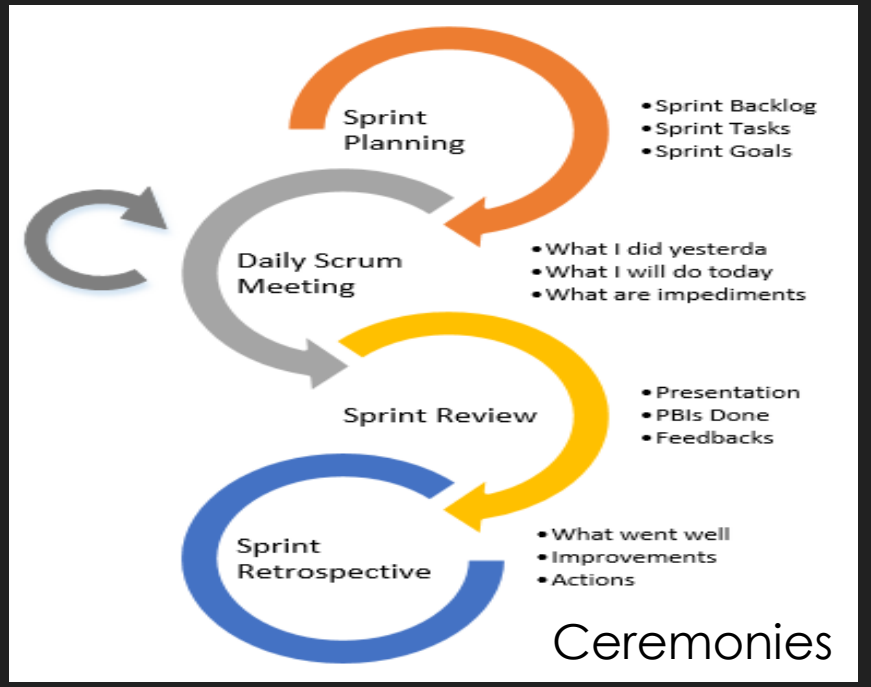
- A Cultural Movement
- It's by practitioners, for practitioners
- DevOps is not a set of tools
- DevOps is also not a standard
- DevOps is a culture of collaboration between developers and system operations

Scrum Snippets

- Scrum is a process framework
- Enables environment for teams to work together
- Is based on 3 pillars
  - Transparency – Parity
  - Inspection – Based on Artefacts
  - Adaptation – Adjustments to minimize deviations
- Sprint Based – Set of activities to be completed with scheduled duration.
- Sprint Durations not exceeding 4 weeks
- Ceremonies Driven

Scrum – Roles & Process





- Product Owner is part of Business or is Customer
- Scrum Master is Facilitator or Mentor or Guide
- Development team
- Scrum Team – Collaboration of all roles

Benefits of Scrum

- Increased ability to manage changing priorities
- Better visibility into projects
- More alignment between business and IT
- Faster time to market

A Brief History of DevOps

- DevOps grew out of Agile software development.
- Initiated by Patrick Debois
- Began as a small niche movement and is now a de facto.

The Goals of DevOps

- Operation teams needs stability and dev team needs speed
- In DevOps Team, both share the same goals
- Shared measurements
- Focus on Time to Market
- Immediate recovery from failures
- Both teams care about speed and stability.

A Story of DevOps vs. Traditional Silos

- Silos are separated teams
- QA team identifies the bugs, Dev team fixes them and Ops team pushes the code to prod.
- All groups claim – “its not my responsibility”
- Need for DevOps Monitoring
- End Result - Happy customers, Happy teams.

Build Automation

- automating the process of preparing code for deployment to a live environment
- it looks like running a command-line tool that builds code using configuration files or scripts
- build automation is more reliable because it's automated -> Few problems

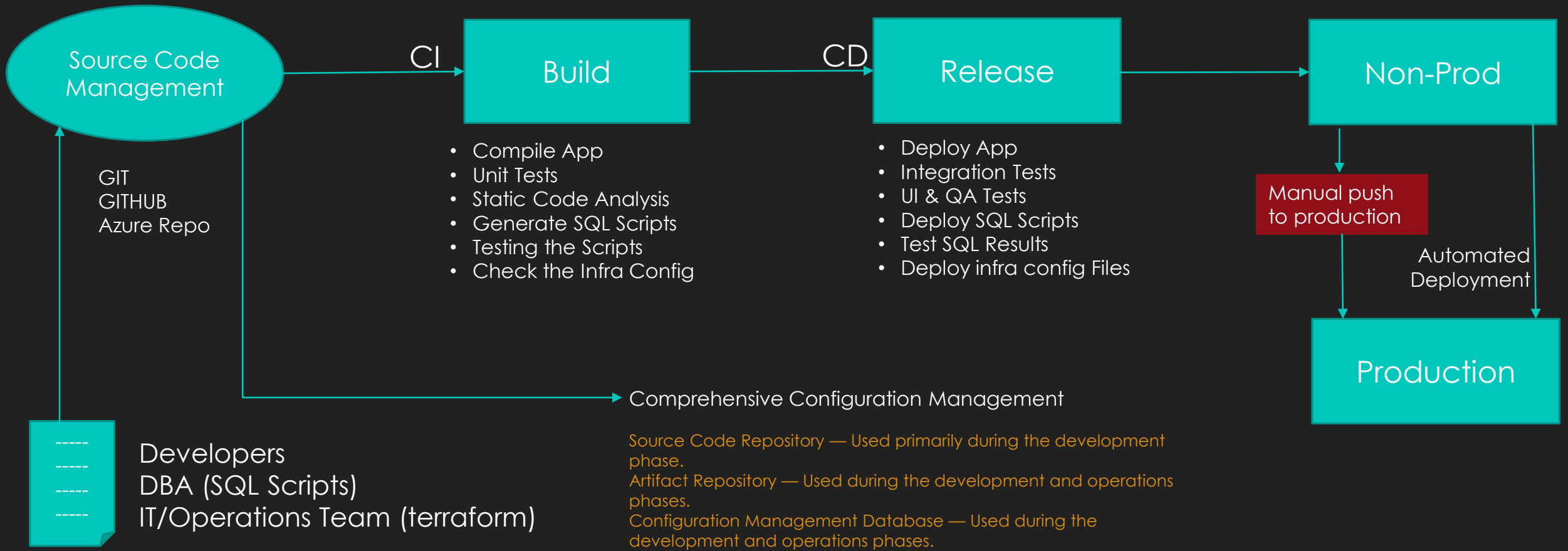
Continuous Integration

- The practice of frequently merging code changes done by developers
- That it allows you to detect certain types of bugs very, very early
- The developers are notified and fix bugs immediately
- Encourages good coding practices

Continuous Delivery and Continuous Deployment

- Continuous delivery - the practice of continuously maintaining code in a deployable state
- Continuous deployment - the practice of frequently deploying small code changes to production

CI – CD Pipeline



Infrastructure as Code

- managing and provisioning infrastructure using code and automation
- we use automation and code to create and change things
- you get reusability when you use Infrastructure as Code
- your infrastructure and any changes made to it are documented
- helps you simplify the complexity.

Configuration Management

- Maintaining and changing the state of pieces of infrastructure in a consistent, maintainable and stable way
- Changes are a normal part of day-to-day life in the IT industry
- Configuration management is a way of minimizing configuration drift
- Configuration drift is the accumulation of all of the small changes

Orchestration

- Orchestration is automation that supports processes and workflows
- Self-healing environments that are capable of handling large changes in load

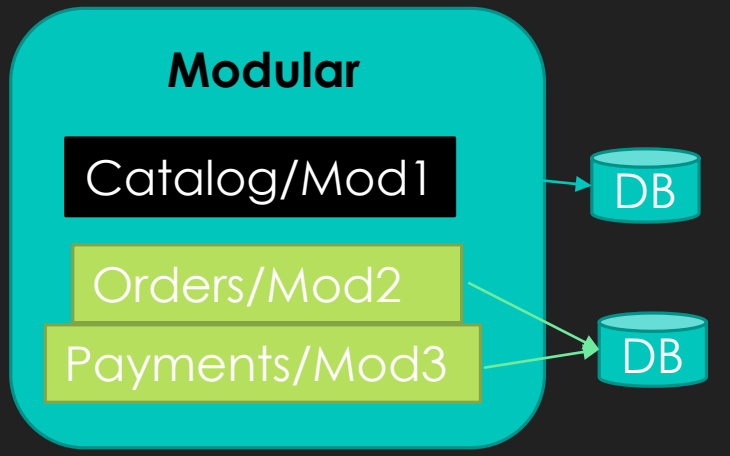
Monitoring

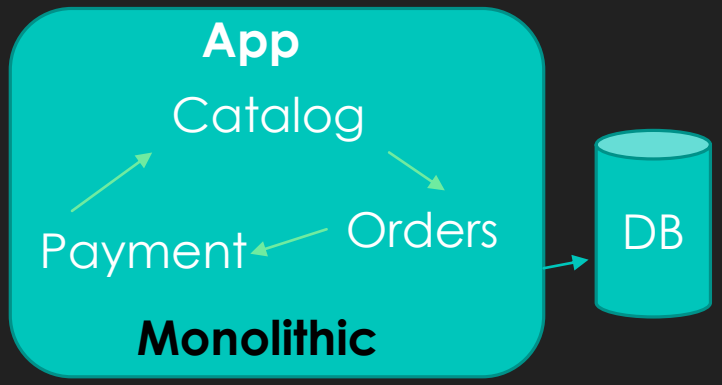
- Collection and presentation of data about the performance and stability of services and infrastructure.
- Monitoring tools collect data about things such as memory usage, cpu, disk i/o in usage of other resource is over time.
- Real time notifications
- PostMortem Analysis

Microservices

- microservices are a particular software architecture
- A microservice architecture breaks an application up into a collection of small, loosely coupled services.
- small pieces broken up into their own individually executable portions

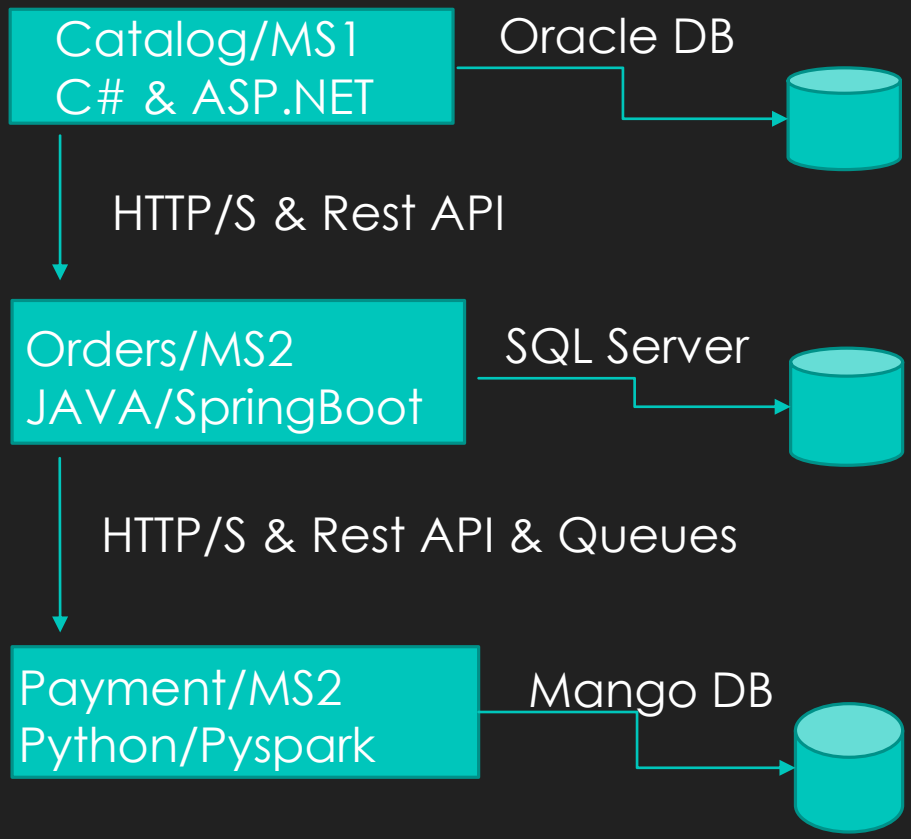
Monolithic vs Modular vs Microservices





Cons of Monolithic
Updates
Team Management
Deployment
Maintainability

Advantages of Microservices
Multi Repository
Independent Deployment
Multi DB Engines
Shorter cycle time
Easier technology selection



Introduction to DevOps Tools

- DevOps has given rise to a large variety of tools in order to support the goals of DevOps.
- https://xebialabs.com/periodic-table-of-devops-tools/
- There's not a single set of tools that works for everyone

Tools for Build Automation and Continuous Integration

- Tools for build automation generally depend on the programming languages and frameworks that have been used to create the code.
- Build Automation Tools - Maven , Gradle, NPM , Grunt, Gulp ,Packer
- CI Tools – Jenkins , Travis CI , Bamboo

Tools for Configuration Management

- Configuration management tools are a great way to implement infrastructure as code.
- Ansible - Opensource
- Puppet – puppet specific language (Puppet DSL)
- Chef – chef specific language
- Salt – minions , Master.YAML

Tools for Virtualization and Containerization

- Virtualization means managing resources by creating virtual rather than physical machines.
- VMWare ESX and ESXi, Microsoft Hyper-V, and Citrix XenServer.
- Containerization is in some ways the next step beyond virtualization.

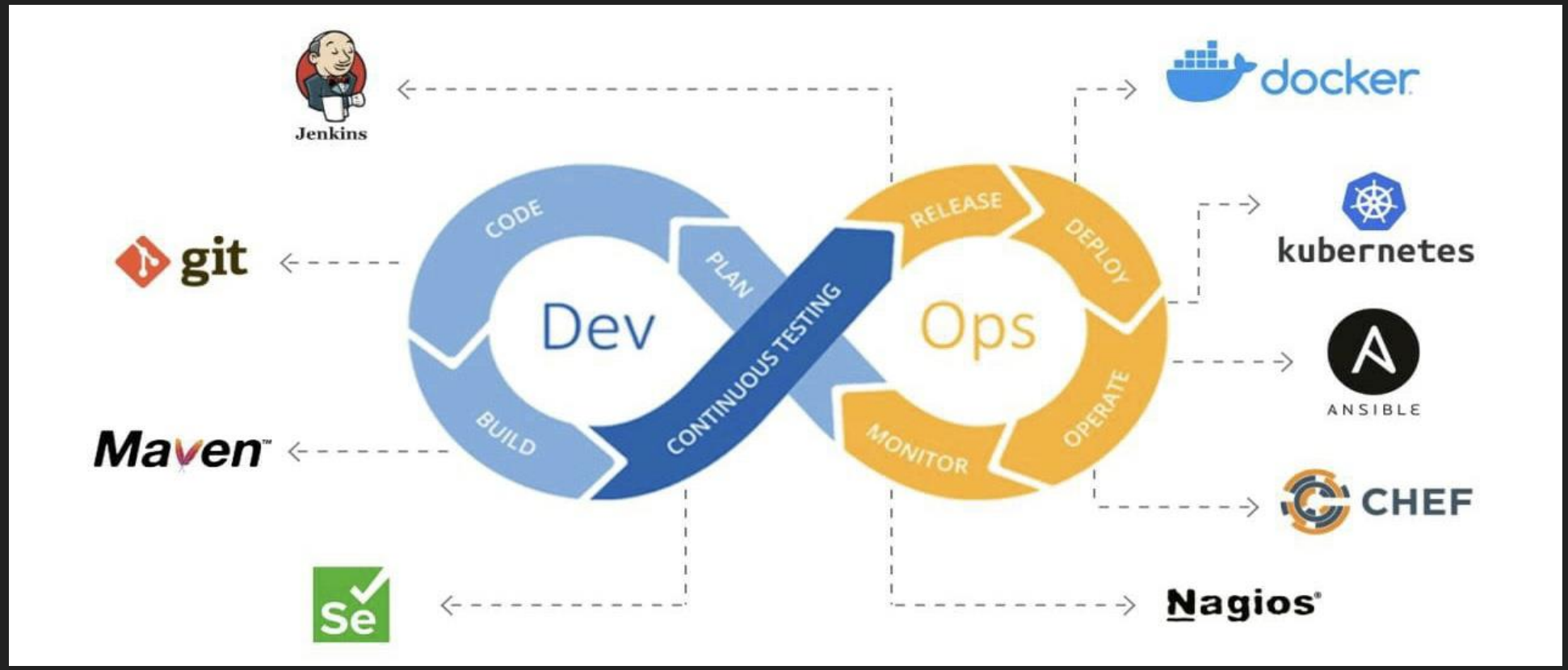
Tools for Monitoring

- SenSu
- NewRelic
- Nagios
- APM tool – App Dynamics
- Aggregation and analytics
  - Kibana
  - Elastic Stack

Tools for Orchestration

- Docker Swarm
- Kubernetes
- Zookeeper
- Terraform

DevOps Infinite Cycle



DevOps and the Cloud

- DevOps and the Cloud, although they're closely related, they are not the same thing.
- Cloud Services can also be a great tool for DevOps.

DevOps and Microsoft Azure

- Azure offers support for continuous integration, continuous delivery and continuous deployment through a variety of features.
- Support for Jenkins
- Azure Container Registry
- Azure Container Services
- Azure DevOps Pipeline
- Azure Webapps
- Azure Application Insights
- Azure Functions

Thank You