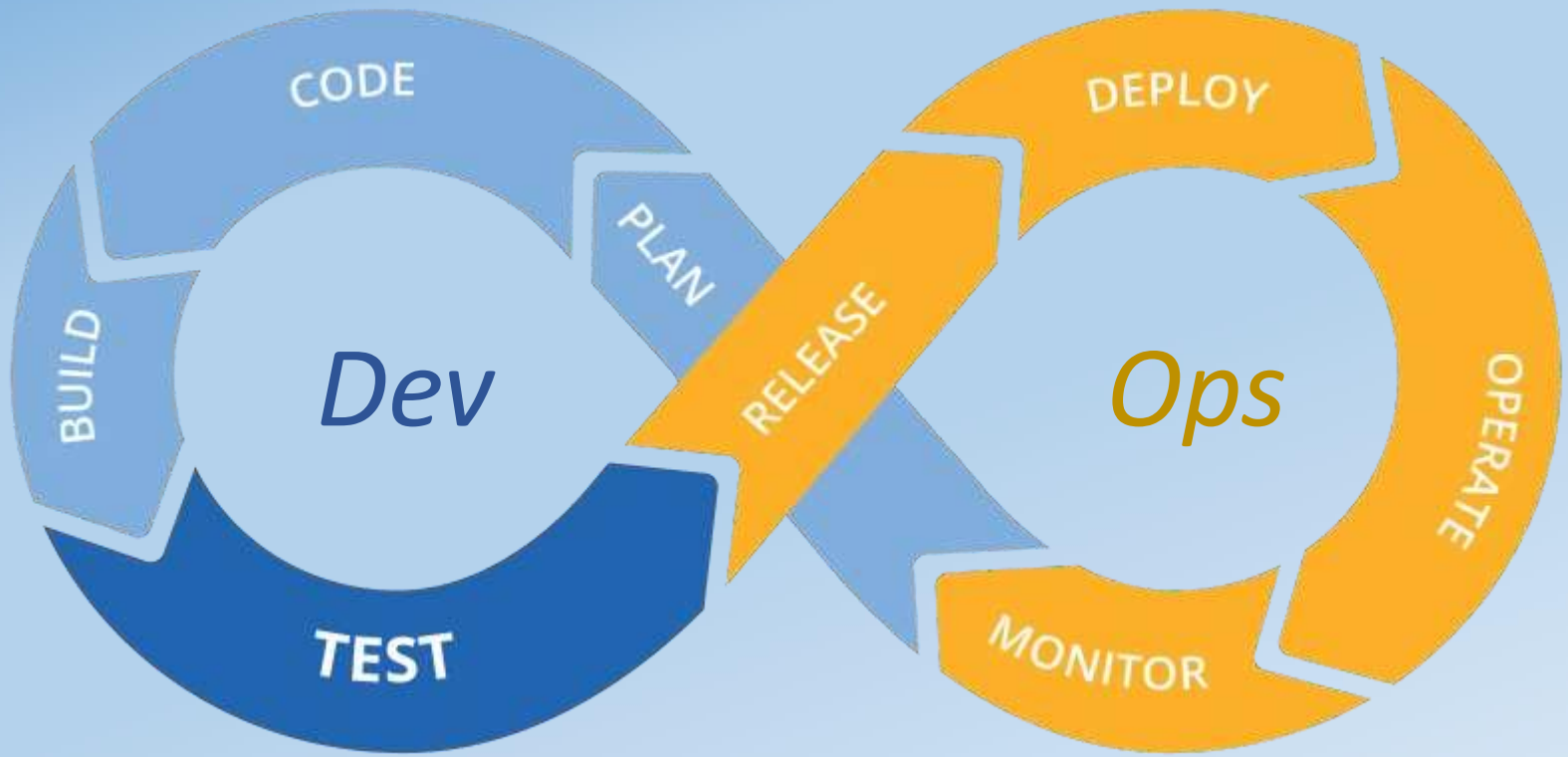


Introduction to DevOps

1. DevOps Overview
2. Traditional Development
3. Technical Challenges
4. Integrated Approach
5. Concepts Technologies
6. DevOps Tools
5. CI / CD
6. DevOps in Cloud

Traditional Development and Operations

What is DevOps

- DevOps is the philosophy of unifying Development and Operations at the culture, practice, and tool levels, to achieve accelerated and more frequent deployment of changes to Production
- The term “DevOps” typically refers to the emerging professional movement that advocates a collaborative working relationship between Development and IT Operations, resulting in the fast flow of planned work (i.e., high deploy rates), while simultaneously increasing the reliability, stability, resilience and security of the production environment

DevOps

- DevOps refers to a collaborative culture between technical teams
- It encompasses much more than just development and operations extending to QA testing, releases and much more
- By aligning goals and sharing strategies, DevOps practices can improve efficiency and quality of product/code shipped, allowing businesses to innovate quickly while providing a higher standard of support

DevOps is about CAMS

Culture

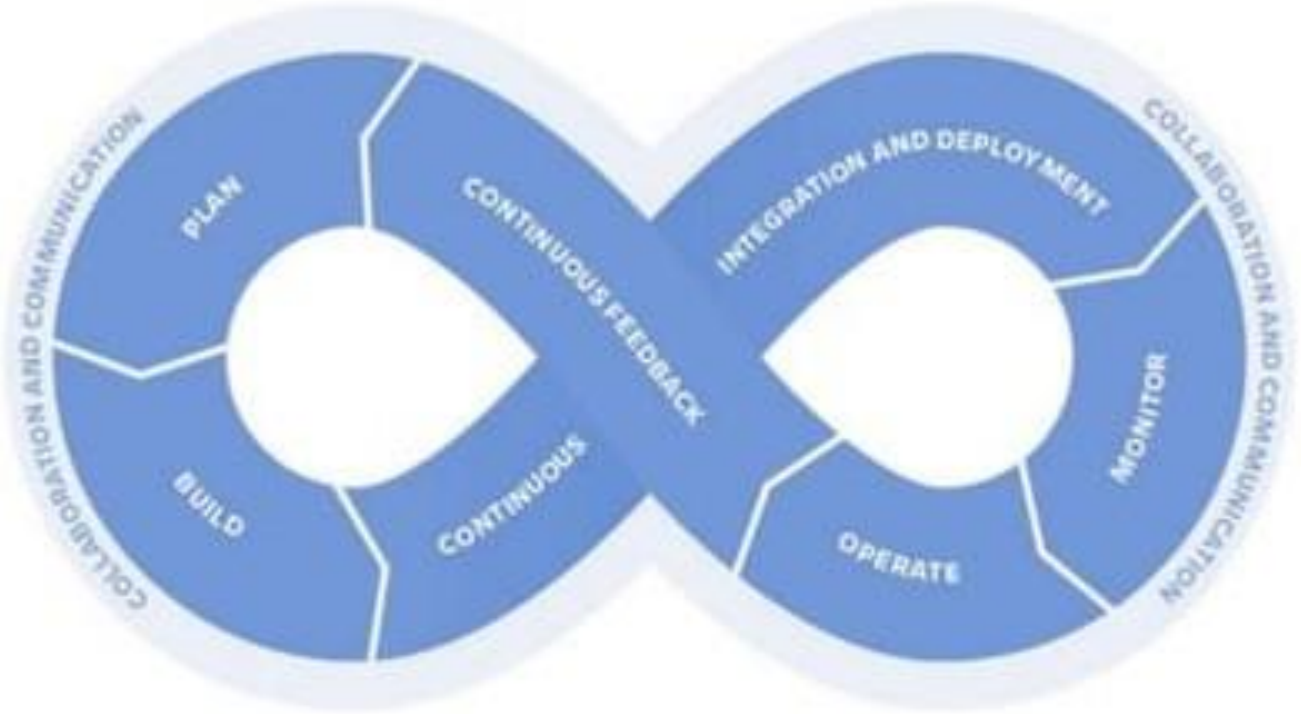
Automation

Measurement

Sharing

Definition

DevOps is a set of practices and tools designed to shorten the life cycle of a software development process.



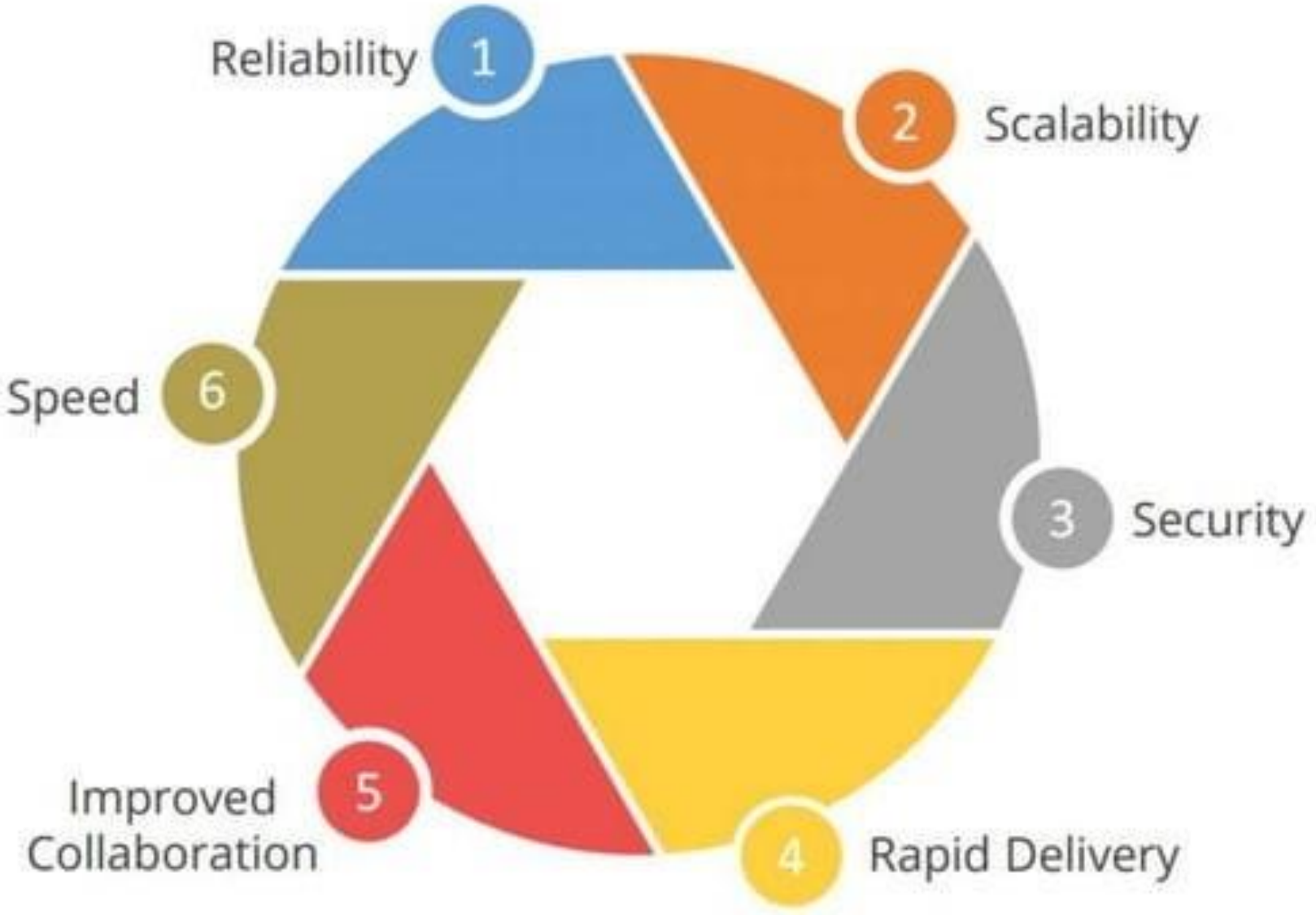
DevOps is ...

A professional cultural movement/philosophy/mindset emphasizing ...

- Continuous collaboration between development & operations
- Automated CI/CD pipelines, working in small-batches, with shorter lead-times (frequent deployment), and low failure-rates.
- Agile (coding & automation) practices applied to infrastructure, configuration, deploying/releasing, and monitoring.

Benefits of DevOps

Benefits of DevOps

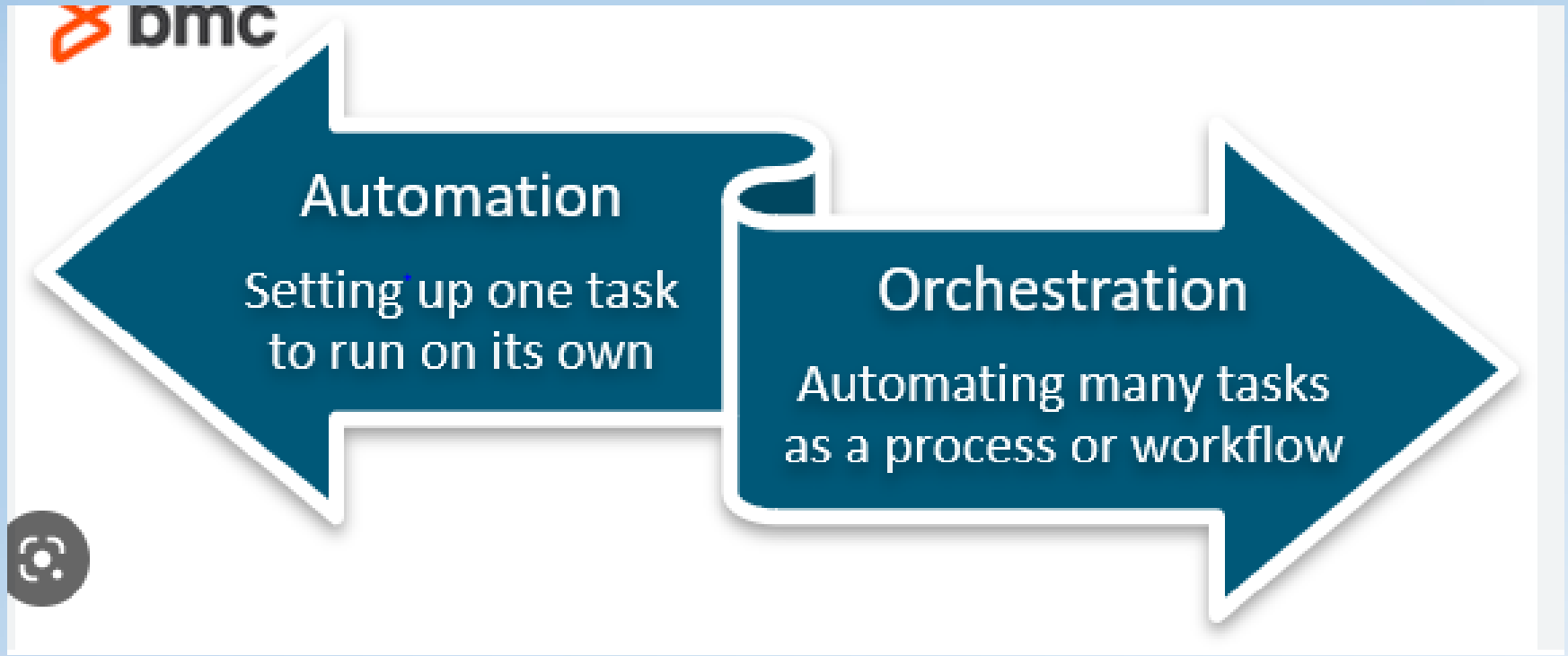


DevOps Orchestration

- DevOps orchestration is the automation of numerous processes that run concurrently in order to reduce production issues and time to market, while automation is the capacity to do a job or a series of procedures to finish an individual task repeatedly.

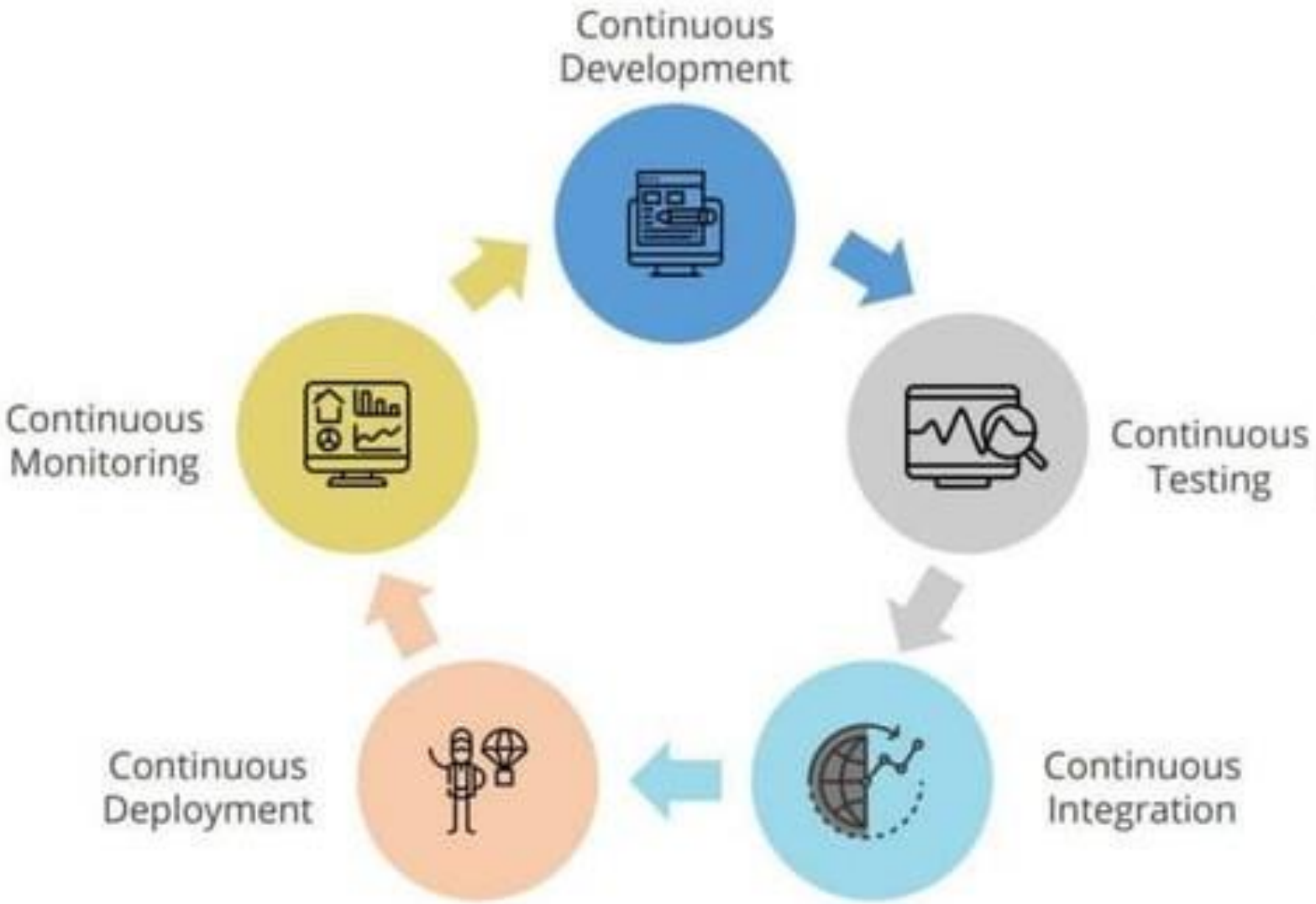
- Many people believe that DevOps orchestration is just merging several jobs into a larger script. DevOps orchestration services include such jobs into a process or workflow, which may involve many automated tasks and stages, and resources to streamline the entire workflow or process.

DevOps Orchestration

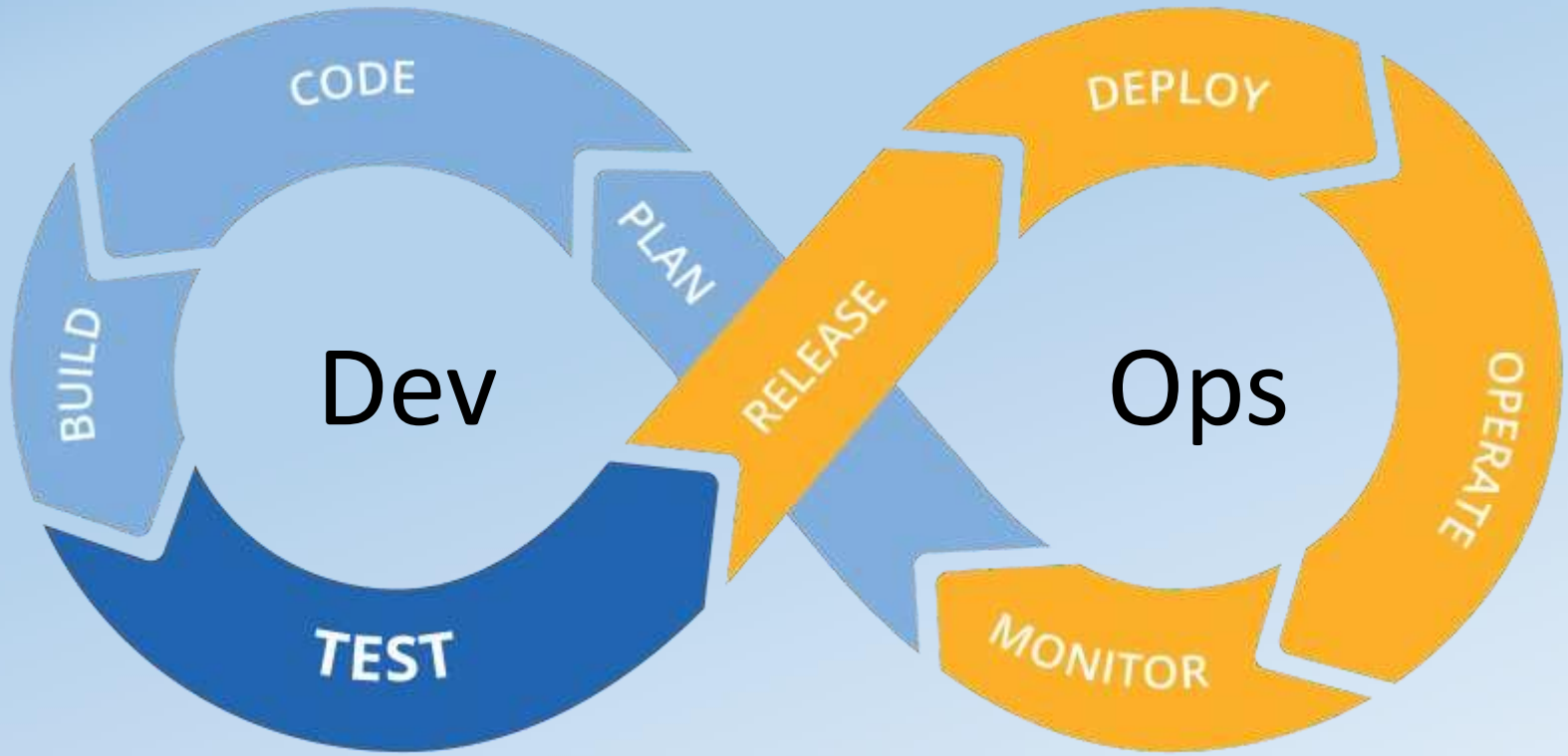


DevOps Architecture

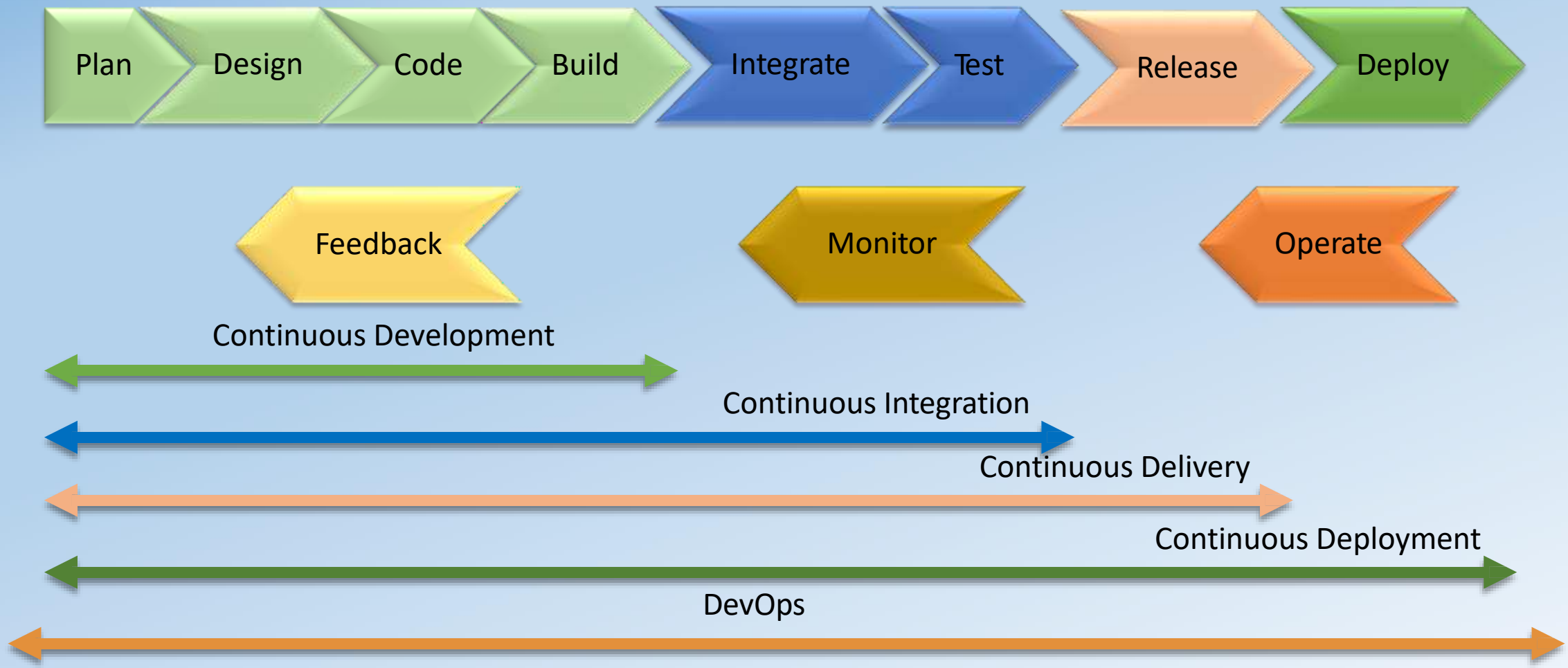
DevOps Architecture

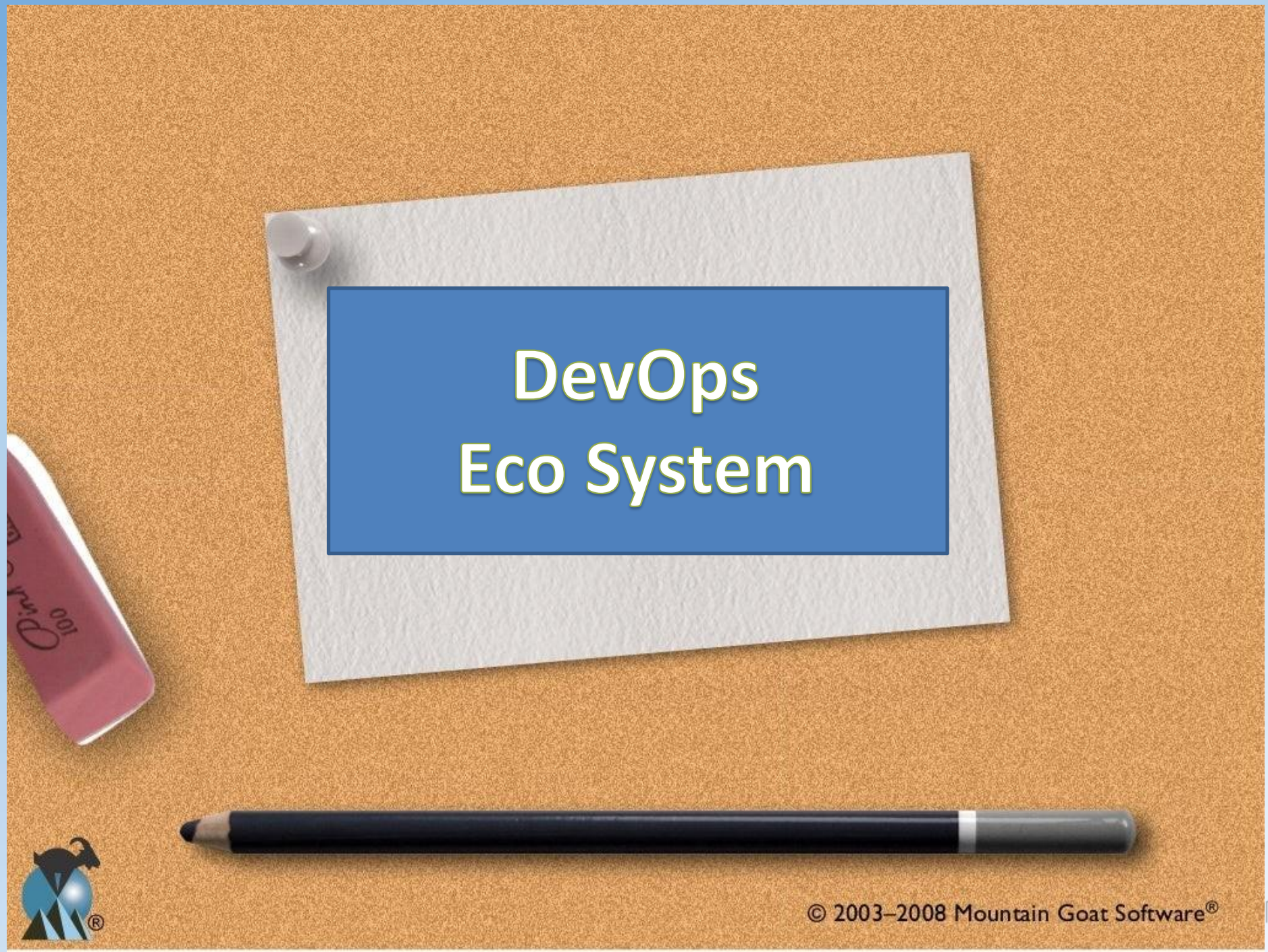


DevOps Life Cycle



DevOps Stages




DevOps
Eco System
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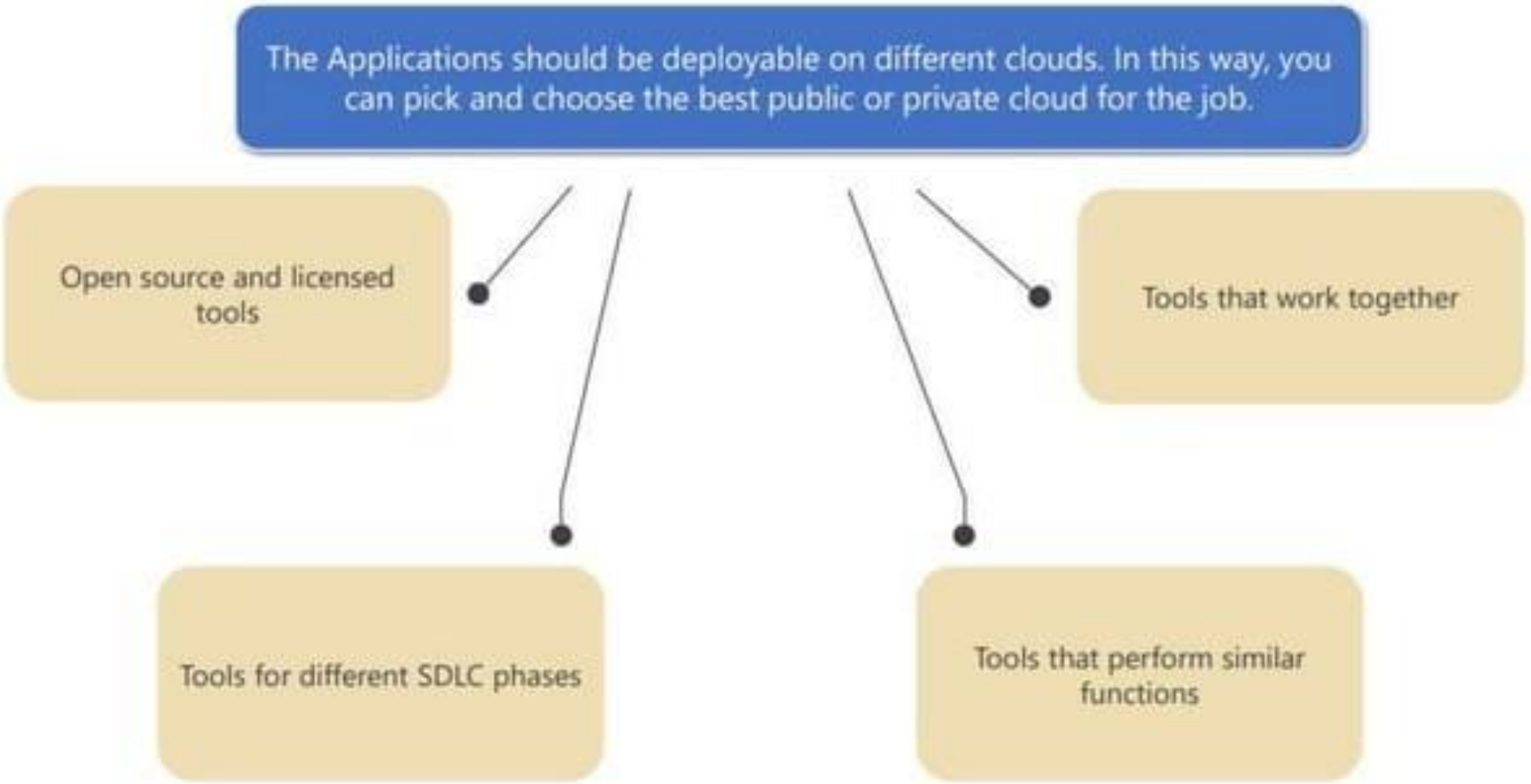
Proper DevOps Tools Selection



DevOps Tools

SCM tools

For Source-Code Management (SCM) ,version control tools such as Git, GitHub, Subversion, TFS, and Mercurial are used.

Maven

Gradle

Software build tools

For automating the build process of an executable application from source code, software build tools such as Maven, Gradle, Ant, and Grunt are used.

DevOps Tools

CMT and Deployment tools

For deployment and operations phase, CMT and automation tools such as Jenkins, AWS CodeDeploy, Chef, Puppet, Ansible, and Terraform are used.

Nagios

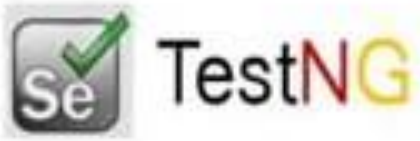
Monitoring tools

For monitoring system performance and productivity, to reduce (or even eliminate) downtime, monitoring tools such as Nagios are used.

Containerization tools

For packaging an application with its required libraries, frameworks, and configuration files to efficiently run it in various computing environments, containerization tools such as Docker and Kubernetes are used.

DevOps Tools



Testing tools

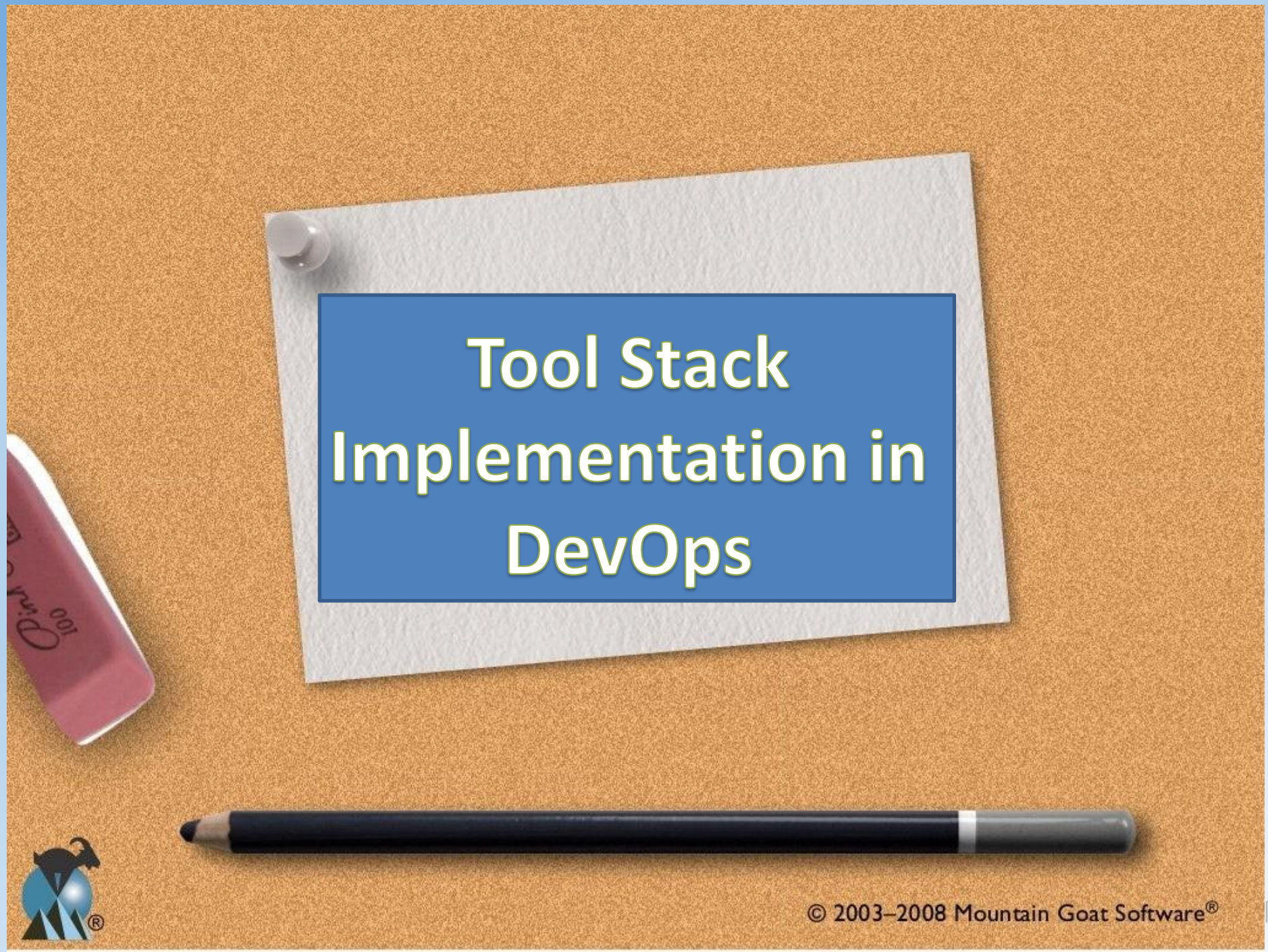
In continuous testing phase, the built software is continuously tested for bugs using testing tools such as Selenium, TestNG, and JUnit.

Integration tools

CI/CD pipelines are created for procuring updated source code and constructing the build into *.exe* format using tools such as Jenkins.

DevOps Automation Tools

- Infrastructure Automation
- Configuration Management
- Deployment Automation
- Performance Management
- Log Management
- Monitoring


Tool Stack Implementation in DevOps
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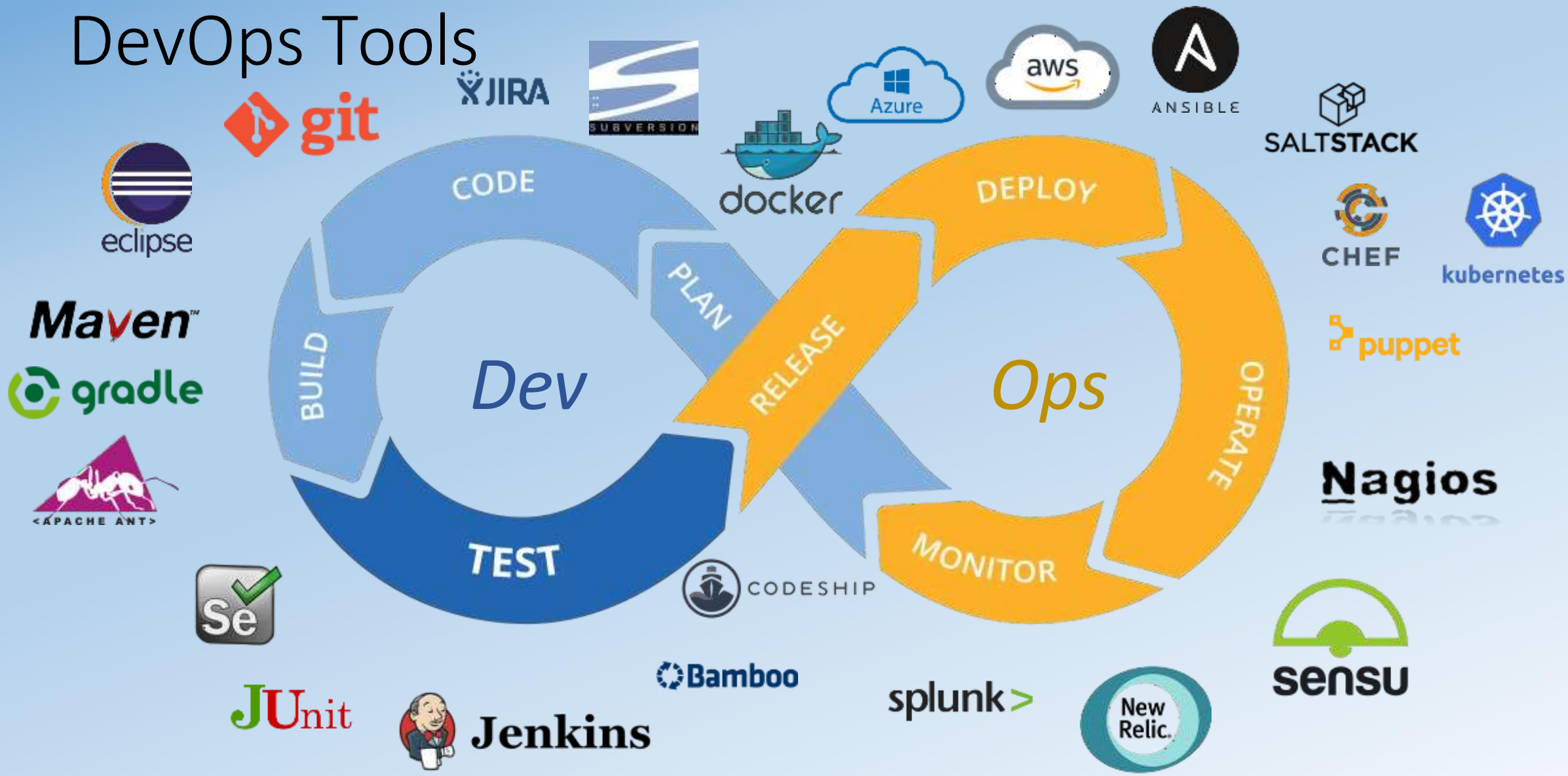
DevOps Tools



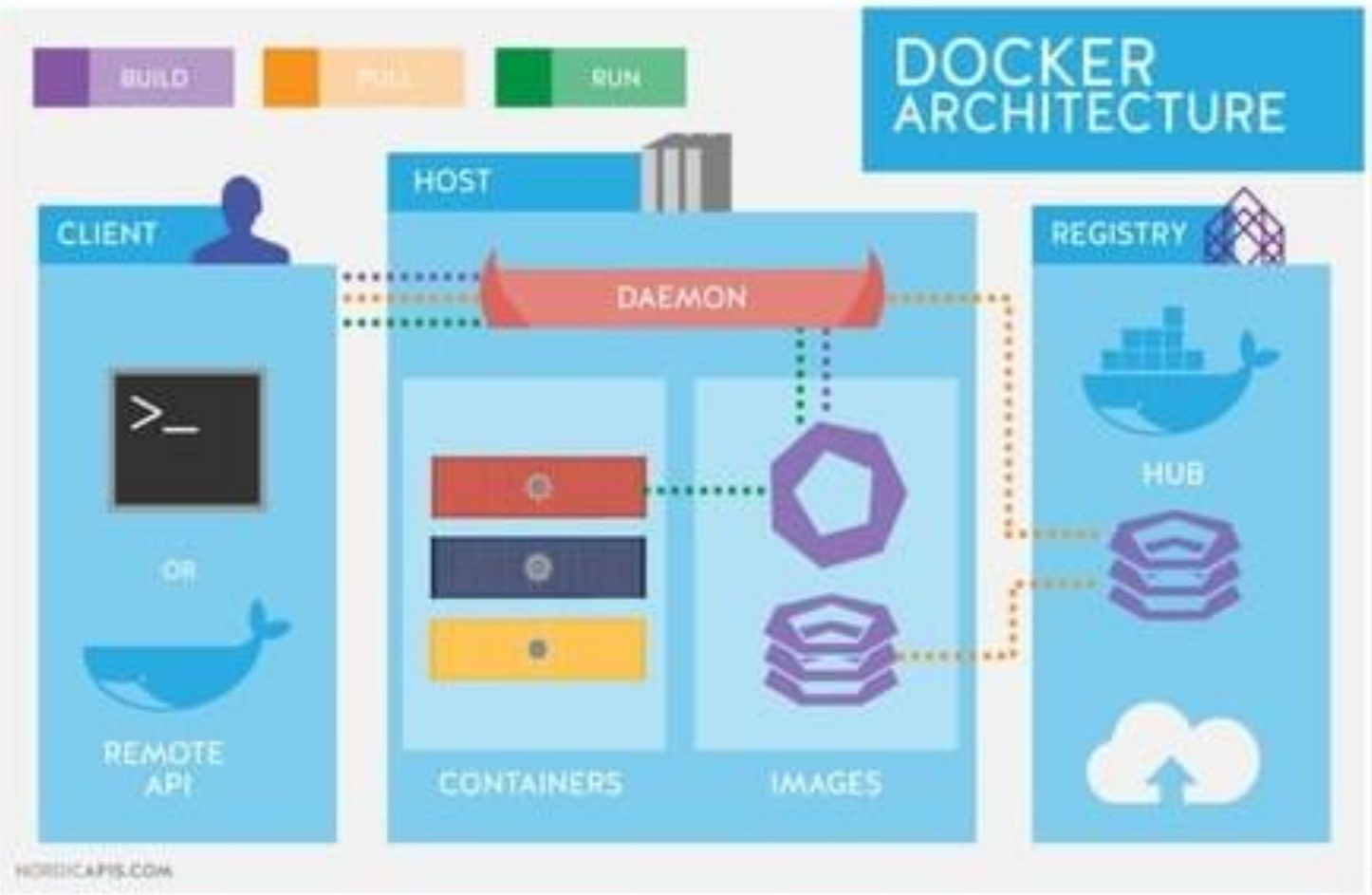
DevOps Tools

Docker

- Docker is at the forefront of the new trend toward containerization.
- It packages together everything that an application needs to run—the code, the runtime, system tools, libraries, etc.—so that applications will operate the same way no matter where they are deployed.
- Containers are more lightweight than virtual machines, and they also offer some security benefits.
- A recent survey conducted by Docker found that 80 percent of enterprises surveyed plan their DevOps implementations around Docker.
- Docker implements a high-level API to provide lightweight containers that run processes in isolation.

docker

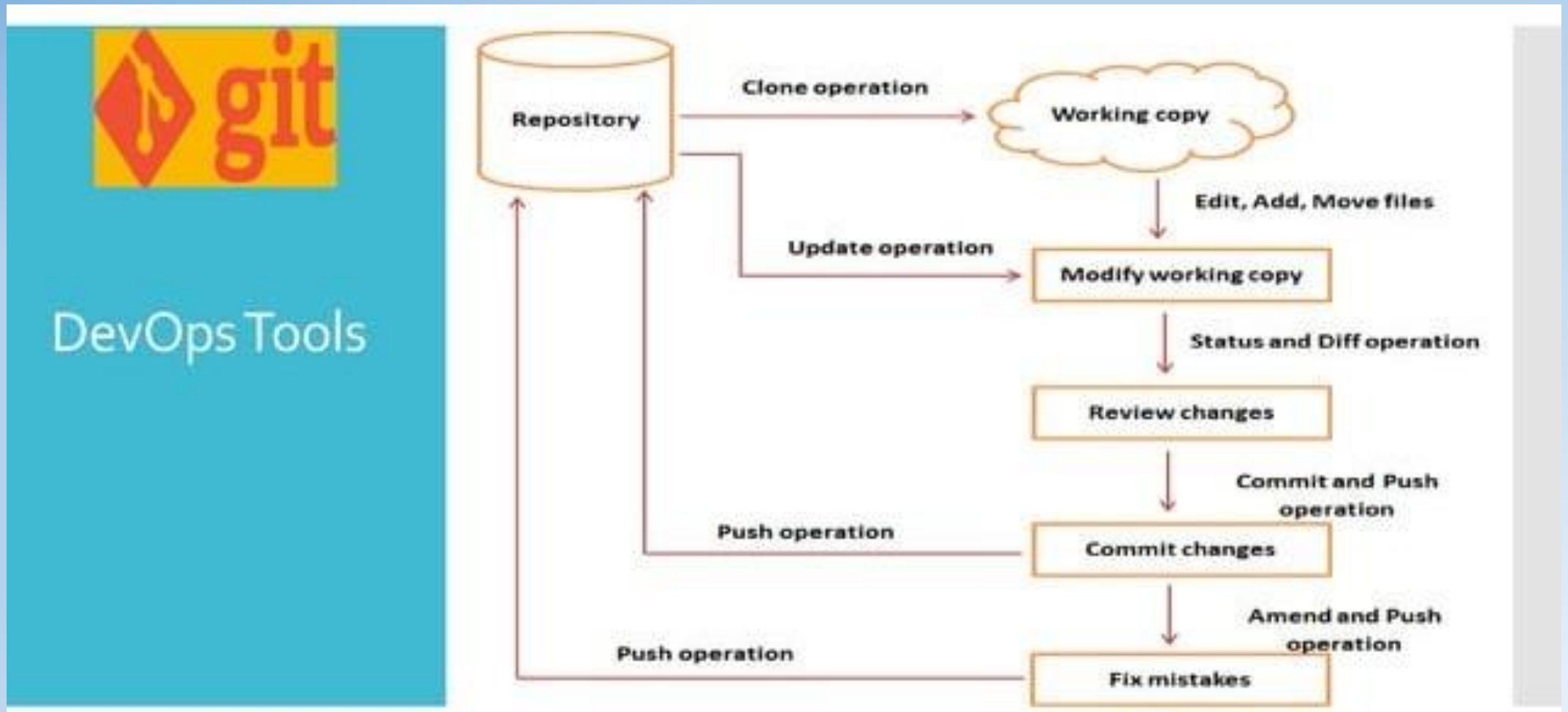
DevOps Tools



DevOps Tools

Git

- In recent years, Git has become incredibly popular for source code management, particularly as the site GitHub has become more popular for hosting open source projects.
- It stands out from other version control management for the ease with which it handles branching and merging.
- It's also very easy to use with distributed development teams, and it offers fast performance.
- Many DevOps teams use it to manage the source code for their applications.
- Its list of well-known users includes many of the biggest firms in the technology industry, such as Google, Facebook, Microsoft, Twitter, LinkedIn, Netflix, the Linux kernel and many others.


git
DevOps Tools
Repository
Clone operation
Working copy
Edit, Add, Move files
Update operation
Modify working copy
Status and Diff operation
Review changes
Commit and Push operation
Push operation
Commit changes
Amend and Push operation
Push operation
Fix mistakes

DevOps Tools

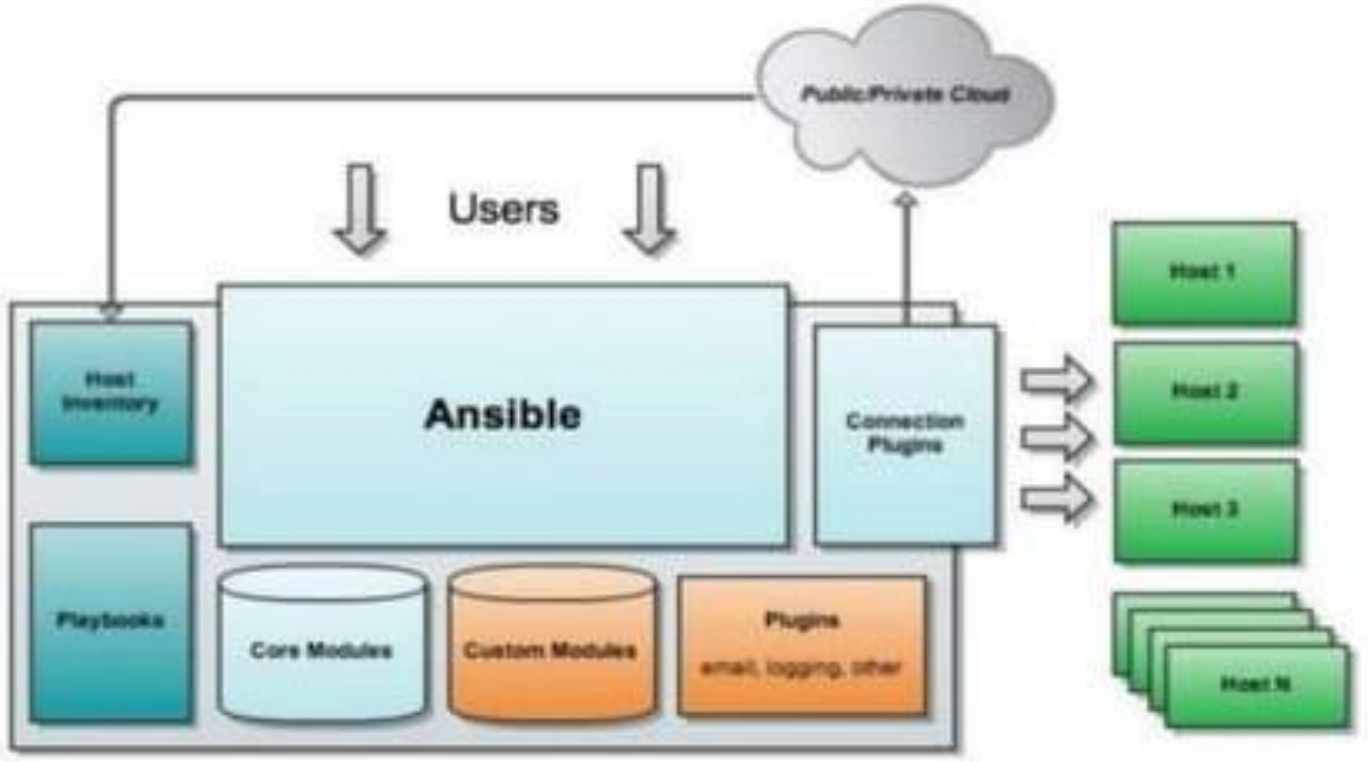
Ansible

- Owned by Red Hat, Ansible automates many common IT operations tasks, such as cloud provisioning, configuration management and application deployment.
- It integrates with a lot of other popular DevOps tools, including Git, JIRA, Jenkins and many others.
- The software has been downloaded more than 5 million times, and it has more than sixteen thousand stars on GitHub.
- The free open source version is available on GitHub, and Red Hat offers three paid versions—self-support, standard and premium—with prices that vary based on the number of nodes in production and the level of support needed.
- Ansible has two types of servers: controlling machines and nodes. First, there is a single controlling machine which is where orchestration begins.

ANSIBLE

DevOps Tools

Ansible architecture



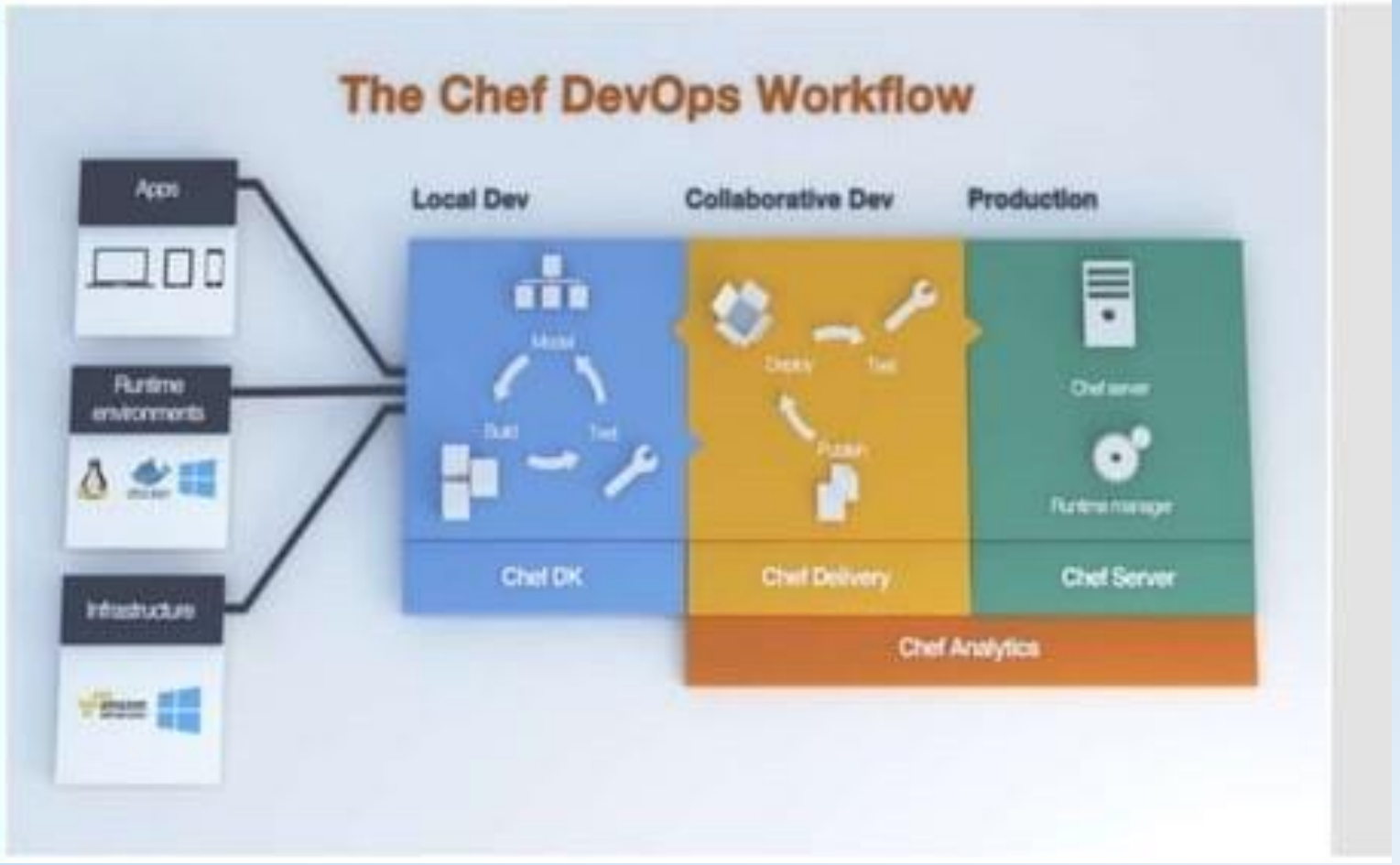
DevOps Tools

Chef

- Another option for infrastructure automation, Chef makes it possible to manage both cloud and traditional environments with a single tool.
- It promises to accelerate cloud adoption while maintaining high availability.
- Quite a lot of documentation and technical resources are available on the Chef site, including many resources designed to help enterprises transition to DevOps and scale their DevOps implementations.
- The company also offers a paid version of Chef called Chef Automate, as well as two other open source projects: InSpec, which focuses on security and compliance, and Habitat, which makes it possible to deploy apps in any environment, including the cloud, bare metal or containers.

CHEF

DevOps Tools



We have to start all over again


Q&A