

Continuous Integration and Continuous Delivery (CI/CD) Pipeline

PPSD PRESENTATION

Group 4

AGENDA

- **Introduction**
 - What is it?
 - Usage & Advantages
 - Techniques
- **DevOps**
 - What is it?
 - Other Traditional Models
 - Role of DevOps in CI/CD
 - Phases & Tools
- **Continuous Integration**
 - Overview
 - Processes
 - Tools: Get Starting with Jenkins
- **Continuous Delivery**
 - Overview
 - Process & Pipeline
 - Continuous Delivery and Development

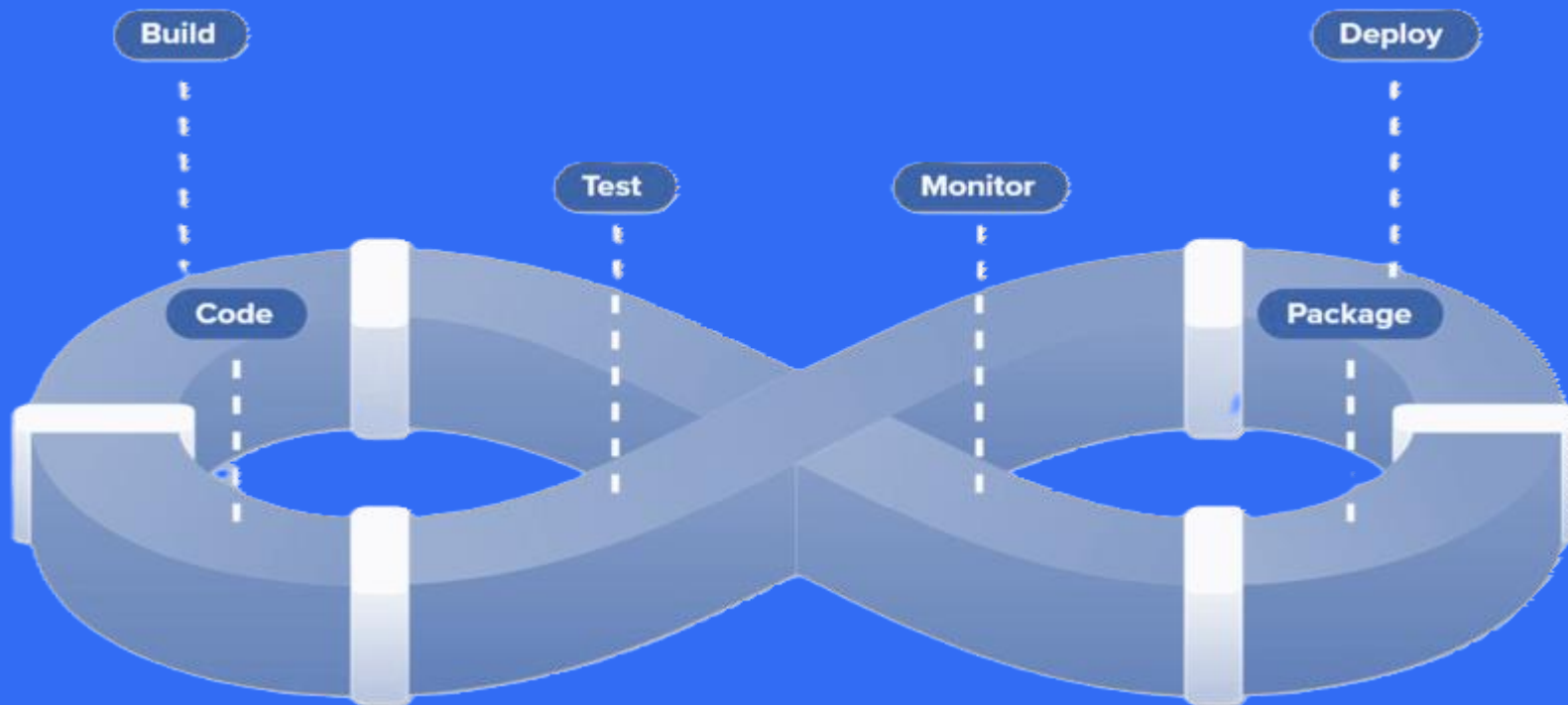
Conclusion

INTRODUCTION

What is CI/CD Pipeline

INTRODUCTION

- The CI/CD (Continuous Integration / Continuous Delivery) pipeline is a set of automated processes that allow developers to efficiently and continuously deliver code changes from development to production



USAGE

CI/CD pipelines are widely used in modern software development to automate and streamline the process of building, testing, and deploying software applications.



Building

Compiling source code and dependencies into executable binaries or artifacts.



Testing

Verifies the functionality, performance, and reliability of the software through automated tests.



Improving

Addresses any issues or bugs identified during testing, ensuring the software meets quality standards.



Deploying

Releasing the tested and fixed software to production or staging environments for end-user access.

ADVANTAGES

Advantages include faster release cycles, improved code quality, reduced risk of errors, and enhanced collaboration between development and operations teams.



Faster Release

deliver new features and updates to users more frequently, staying competitive in rapidly evolving markets.



Collaboration

fosters teamwork and communication between developers and operations teams.



Improve Quality

software works as expected, with fewer bugs and errors.

DevOps & CI/CD

Overview

Waterfall

Waterfall is traditional approach of software development where everything happens step by step.

Series includes Requirements Gathering, Design, Development, Testing, Maintenance

Its less flexible and costly.

Structured Approach

Provides a clear and structured approach to software development

Rigidity

Less adaptable to changes in requirements or unforeseen issues, leading to potential delays and increased costs.

Predictable Projects

It is commonly used in projects with a clear understanding of scope and limited uncertainty.



Flexibility

Enables teams to respond quickly to customer feedback and market changes.

Dynamic Projects

Commonly used in software development projects where innovation, responsiveness, and customer satisfaction are priorities.

Communication

Iterative development cycles for rapid and adaptable delivery of software solutions through collaborative teamwork and continuous improvement.

Agile

Programmers creates prototypes to understand client's requirements

The entire process is break down into small actions called sprints which is submitted every 2 weeks.

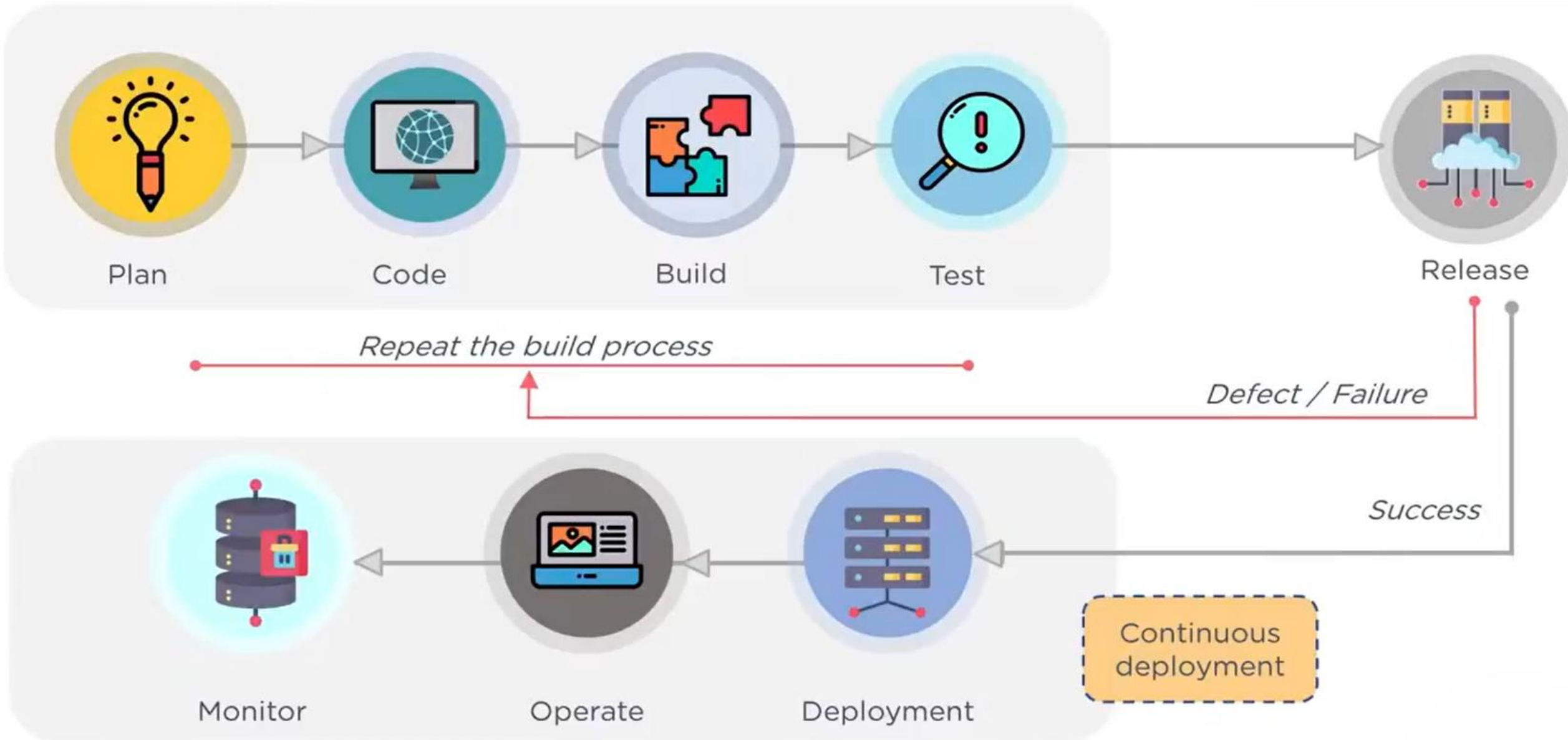
Fails when developers and operation team works in silos

DevOps Phases

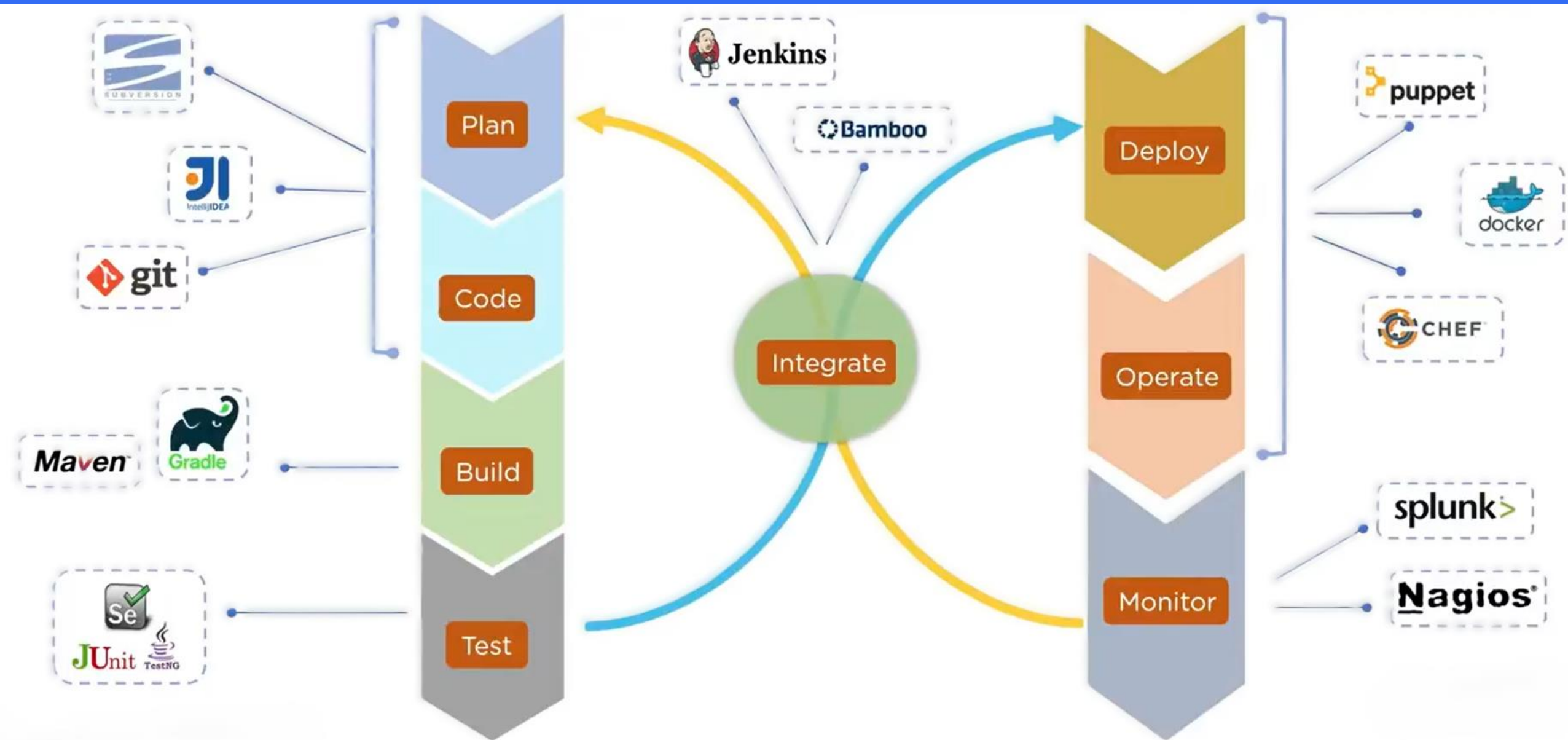
DevOps is typically broken down into eight distinguished phases as an operational model. The phases operate in a continuous loop, with each phase providing value to the phase ahead of it



Role of DevOps in CI/CD



DevOps Tools

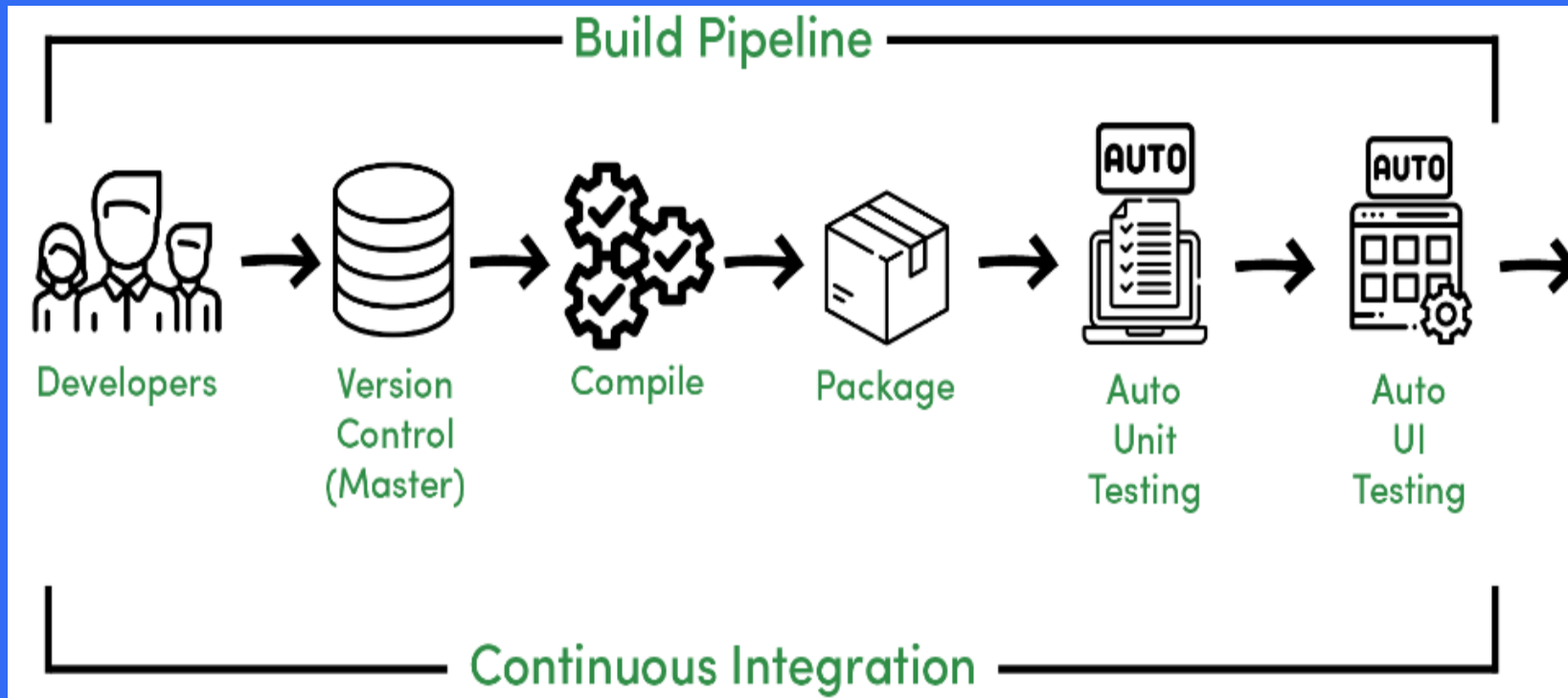


Continuous Integration & Delivery

Overview

CI Phase

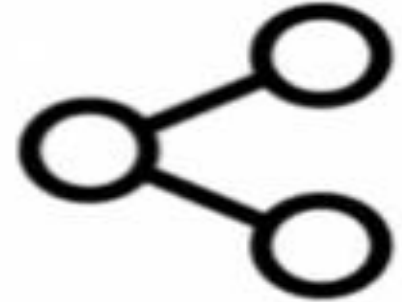
Continuous Integration is a development practice of code integration into a shared repository. Each integration is verified by an automated build and automated test.



Continuous Integration



Developer



Branch



Developer



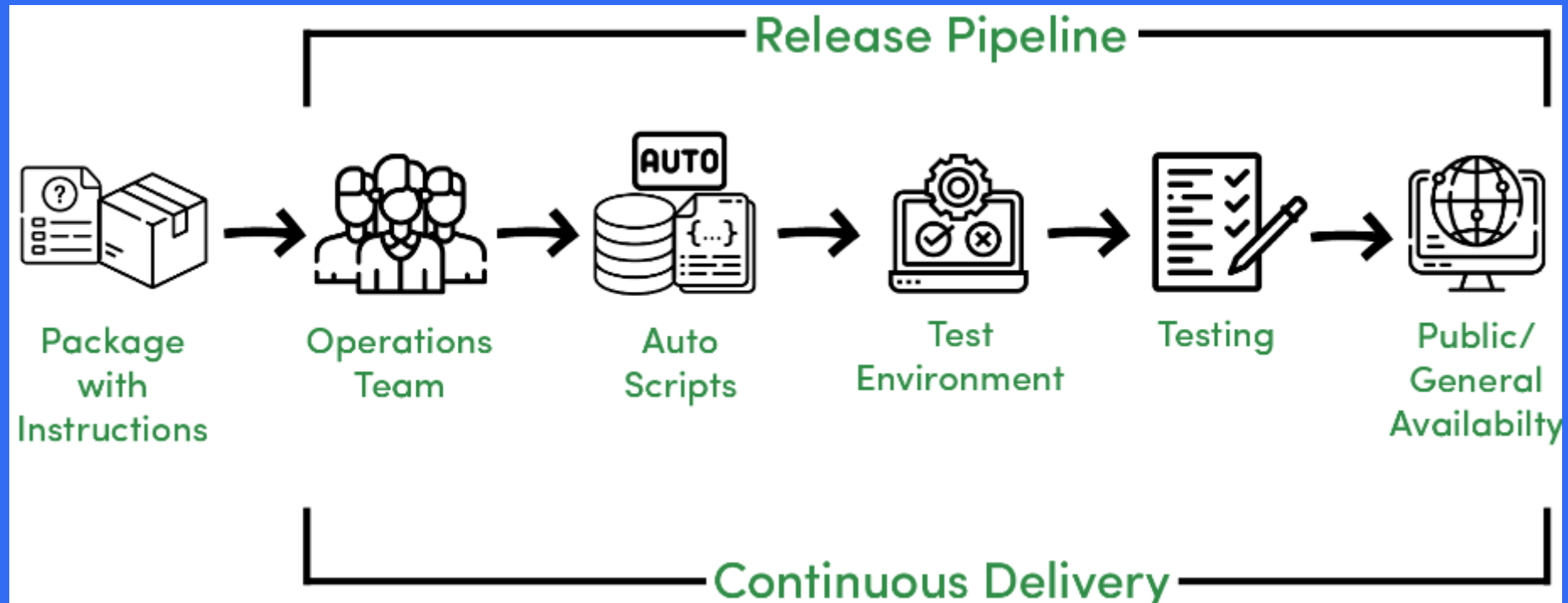
Unit test



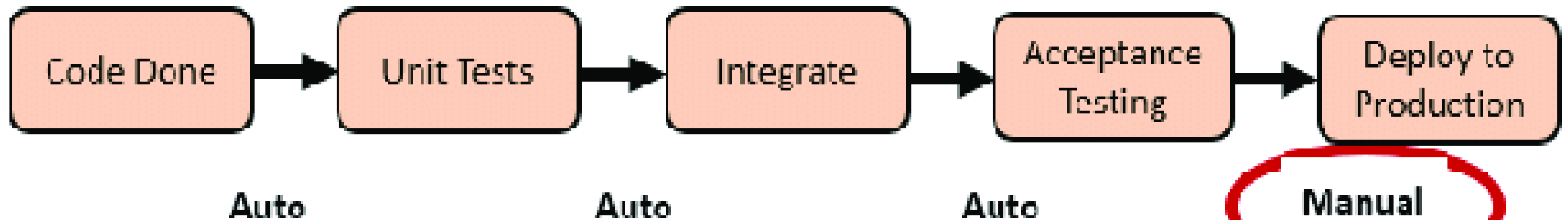
Branch

CD Phase

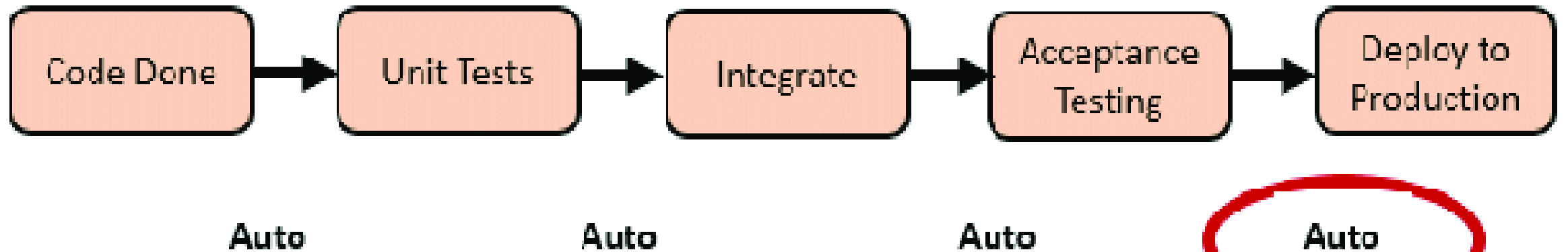
Continuous Delivery is a development practice of code which occurs after the integration phase.



Continuous Delivery & Deployment



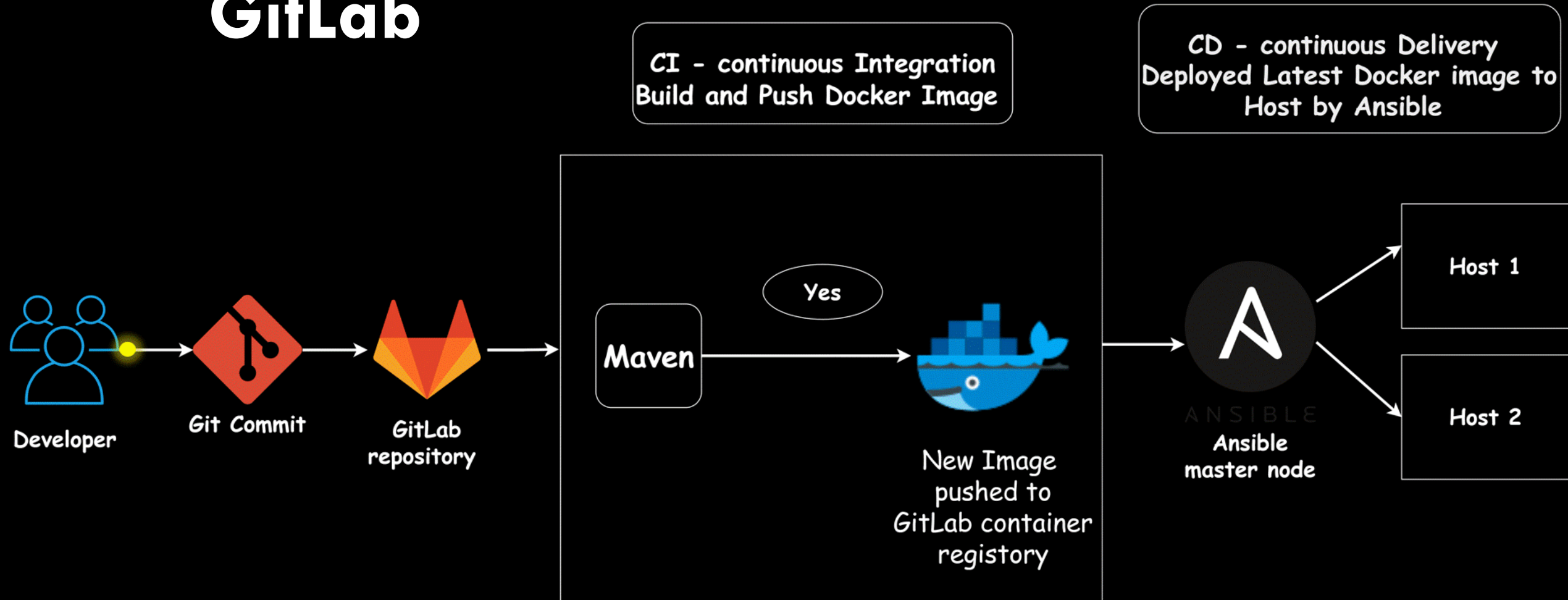
Continuous Deployment

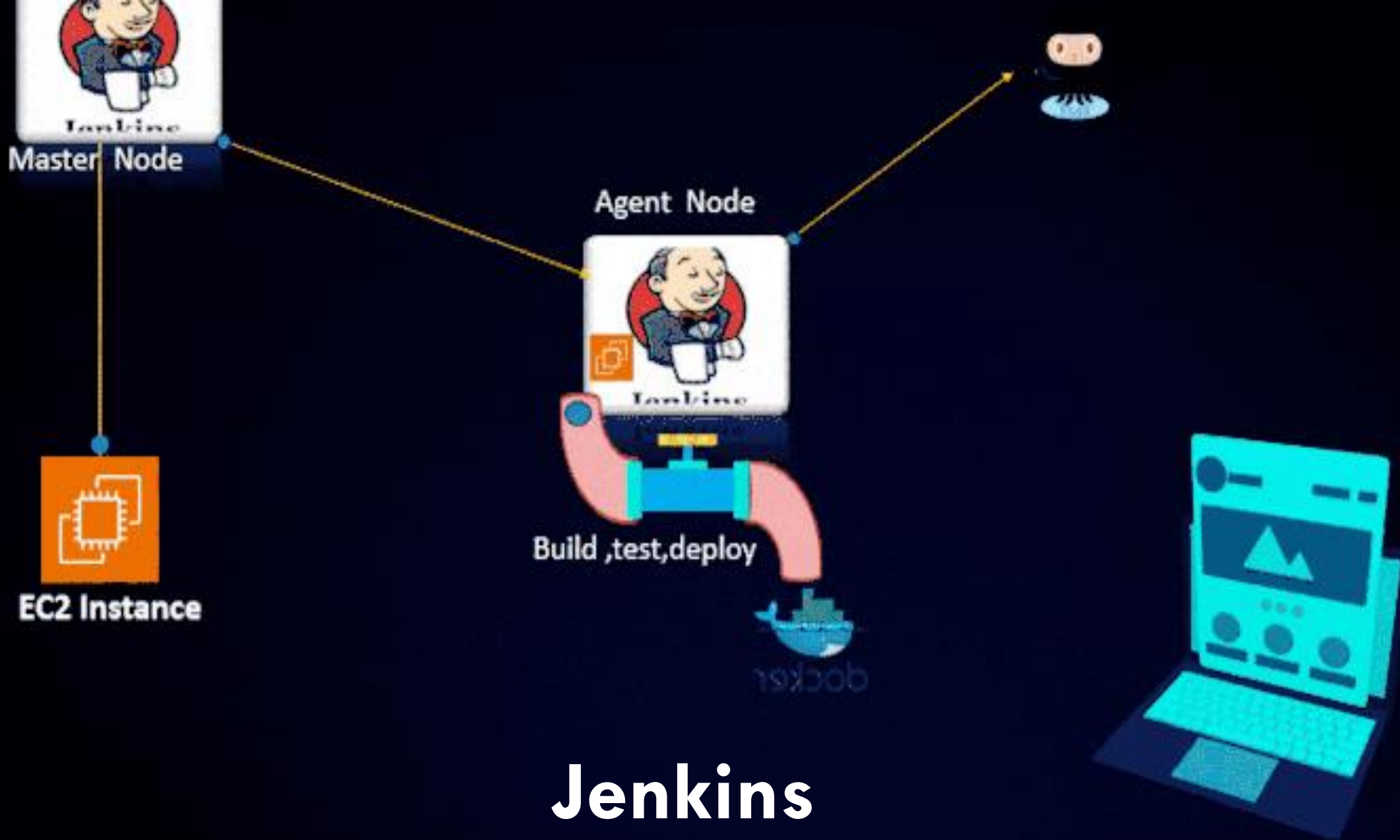


Sample CI/CD Pipeline

Demonstration of a sample CI/CD pipeline using
tools

GitLab





Conclusion

Finalization



Strengths



- **Improving Code Quality**
- **Accelerating Delivery Cycles**
- **Enabling Faster Feedback Loops**

Percentage Chart

By leveraging CI/CD pipelines, organizations can achieve continuous improvement in code quality, delivery speed, and responsiveness to customer needs, ultimately driving business success and innovation

55%

CI/CD pipelines can lead to significant improvements in delivery speed, with some companies reporting up to 90% reductions in deployment times.



45%

CI/CD practices promote better code quality by automating code reviews, testing, and validation processes.

Numerical Stats

4 Million builds per day

Google

Utilizes CI/CD extensively for its wide range of products, including Google Search, Gmail, and Google Cloud Platform.

50 Million per year

Amazon

Emphasizes CI/CD practices for its cloud computing services and various online retail operations.

1 Thousand per day

Netflix

Relies heavily on CI/CD for its streaming platform, enabling rapid feature releases and updates.

THANKS

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