


DevOps



Caltech

Center for Technology &
Management Education

Post Graduate Program in DevOps



Introduction to Configuration Management

Learning Objectives

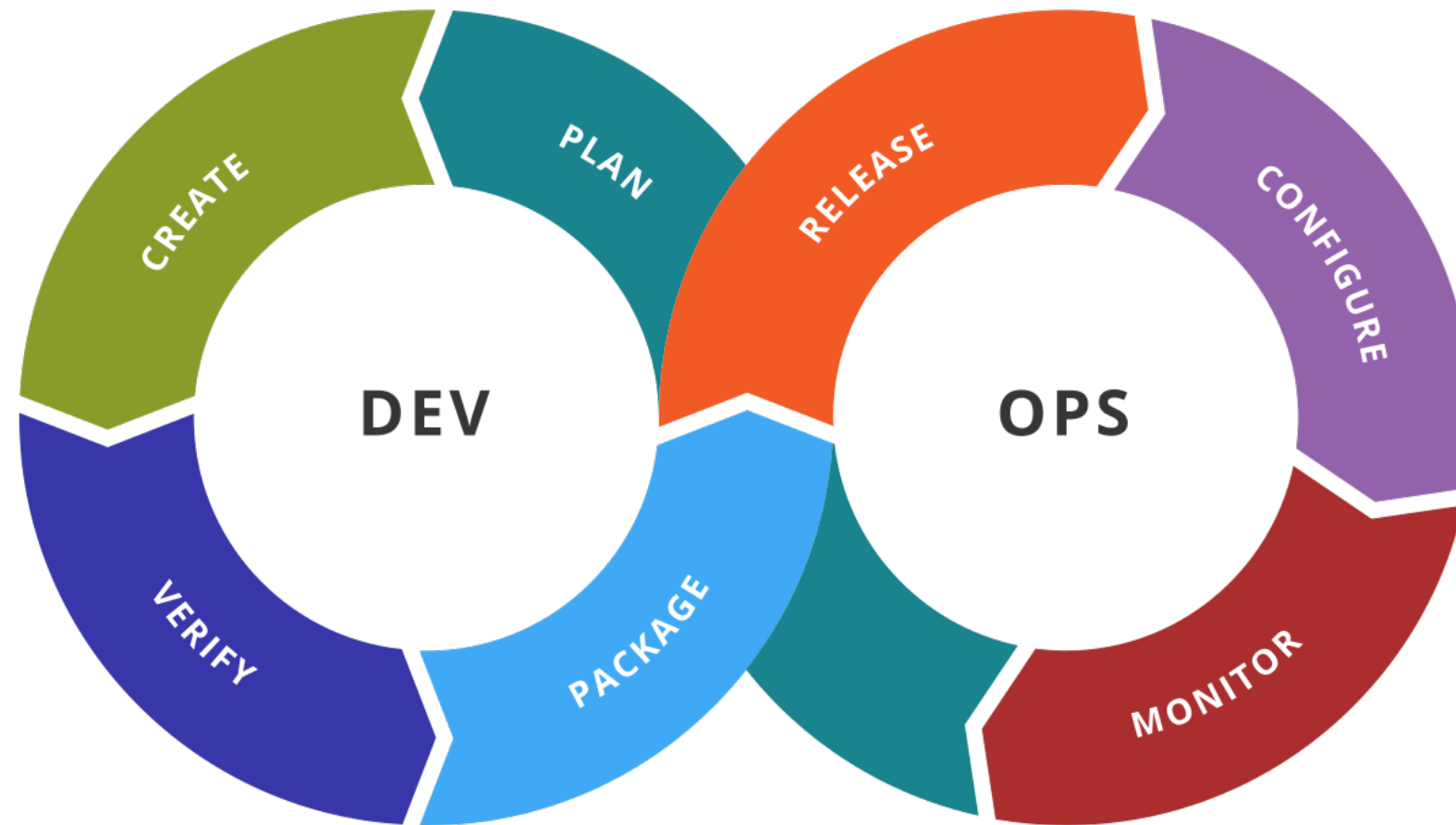
By the end of this lesson, you'll be able to:

- 🕒 Explain DevOps
- 🕒 Illustrate DevOps lifecycle and its core components
- 🕒 Define basics of configuration management
- 🕒 Explain the tools used for configuration management



Revisiting DevOps

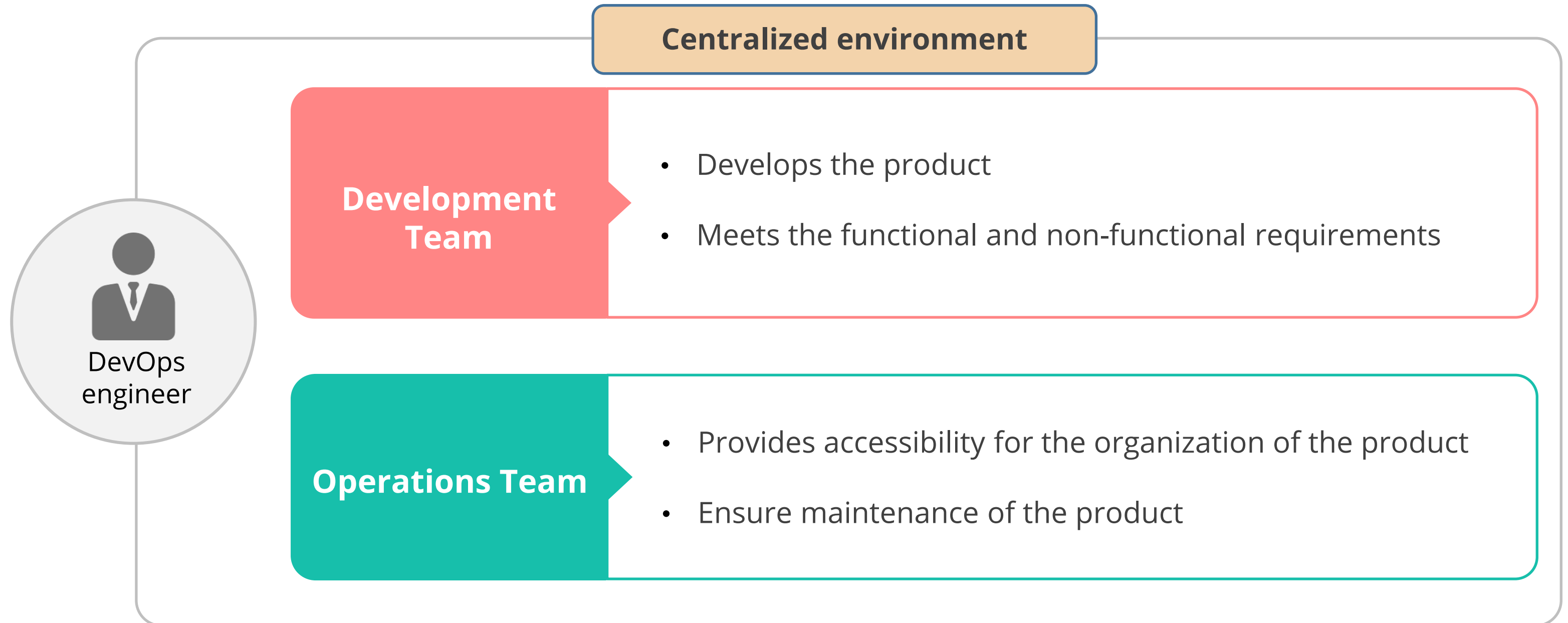
What Is DevOps?



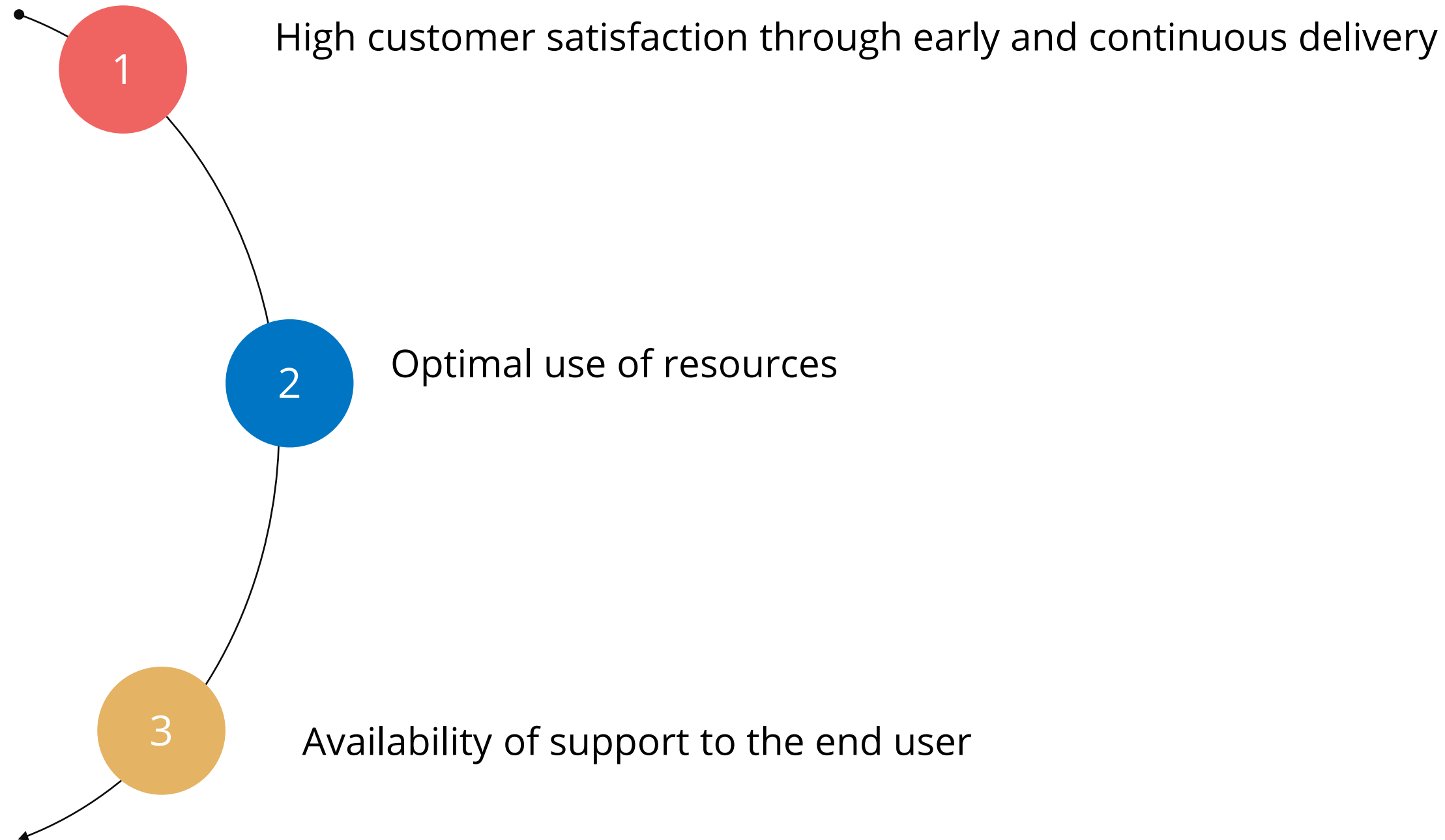
- DevOps is an agile relationship between development and IT operations.
- DevOps is the abbreviation for **Dev**elopment and **Ops**erations.
- The Development phase includes Plan, Create, Verify, and Package.
- The Operations phase includes Release, Configure, and Monitor.

Role of DevOps Engineer

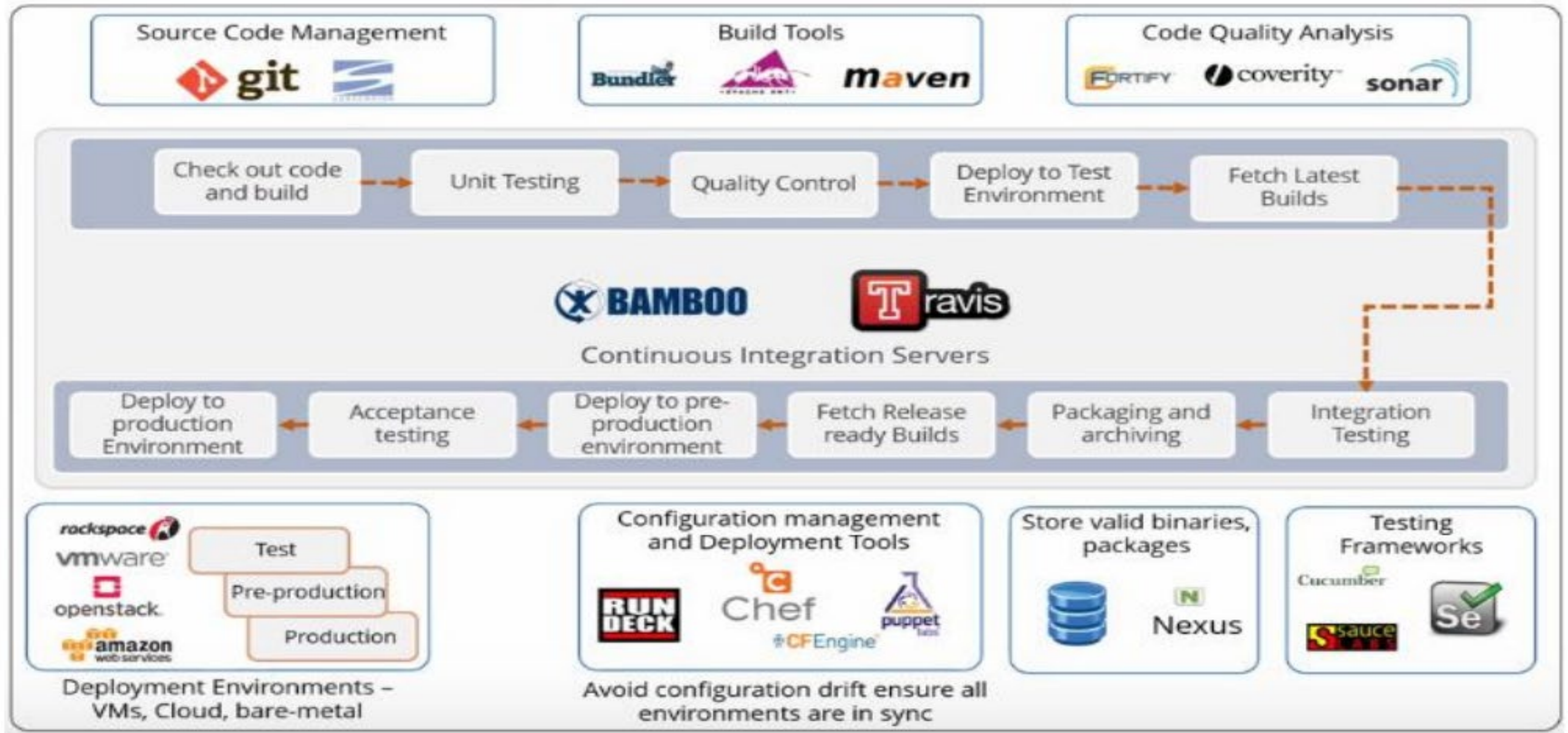
The major role of a DevOps engineer is to set up a centralized environment for different teams to collaborate and work together.



Benefits of Agile and DevOps

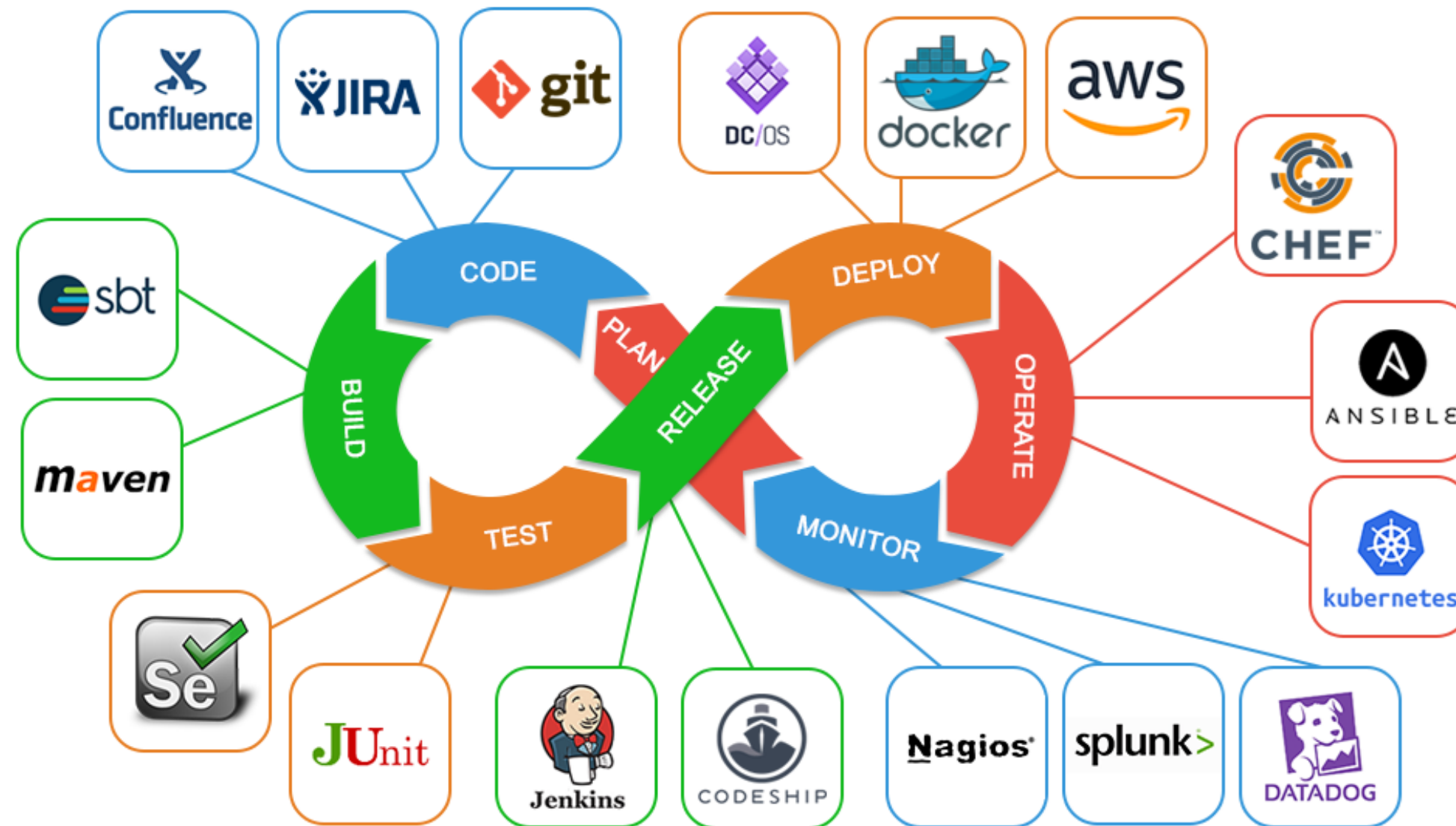


Flow of Agile and DevOps

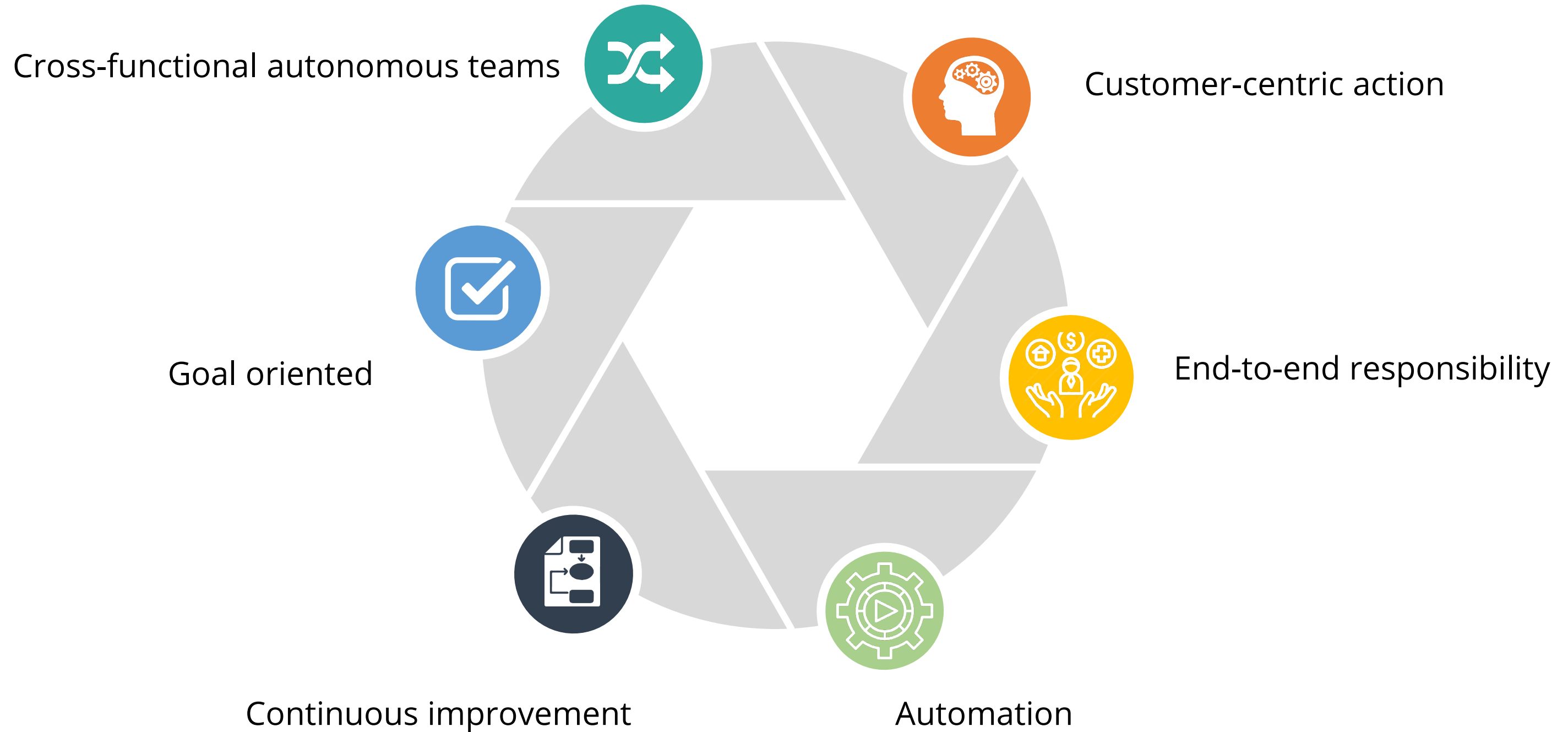


DevOps Tools

The various tools required to implement DevOps and work within the DevOps setup are



DevOps Principles



Benefits of DevOps

Speed

Automation through DevOps practices results in quick development and bug fixes.

Rapid delivery

As DevOps works with Agile, it helps in delivering the finished product to the customer in less time.

Reliability

It helps in improving and providing support to the customer with the help of CI/CD.



Scalability

Automation and centralized working environment provide room for scaling the project whenever required.

Collaboration

DevOps provides high interaction between different teams resulting in quality product and less bugs.

Security

Automated compliance, fine-grained controls, and infrastructure as code are some of the policies used for security implementations while adopting DevOps.

Configuration Management

Configuration Management

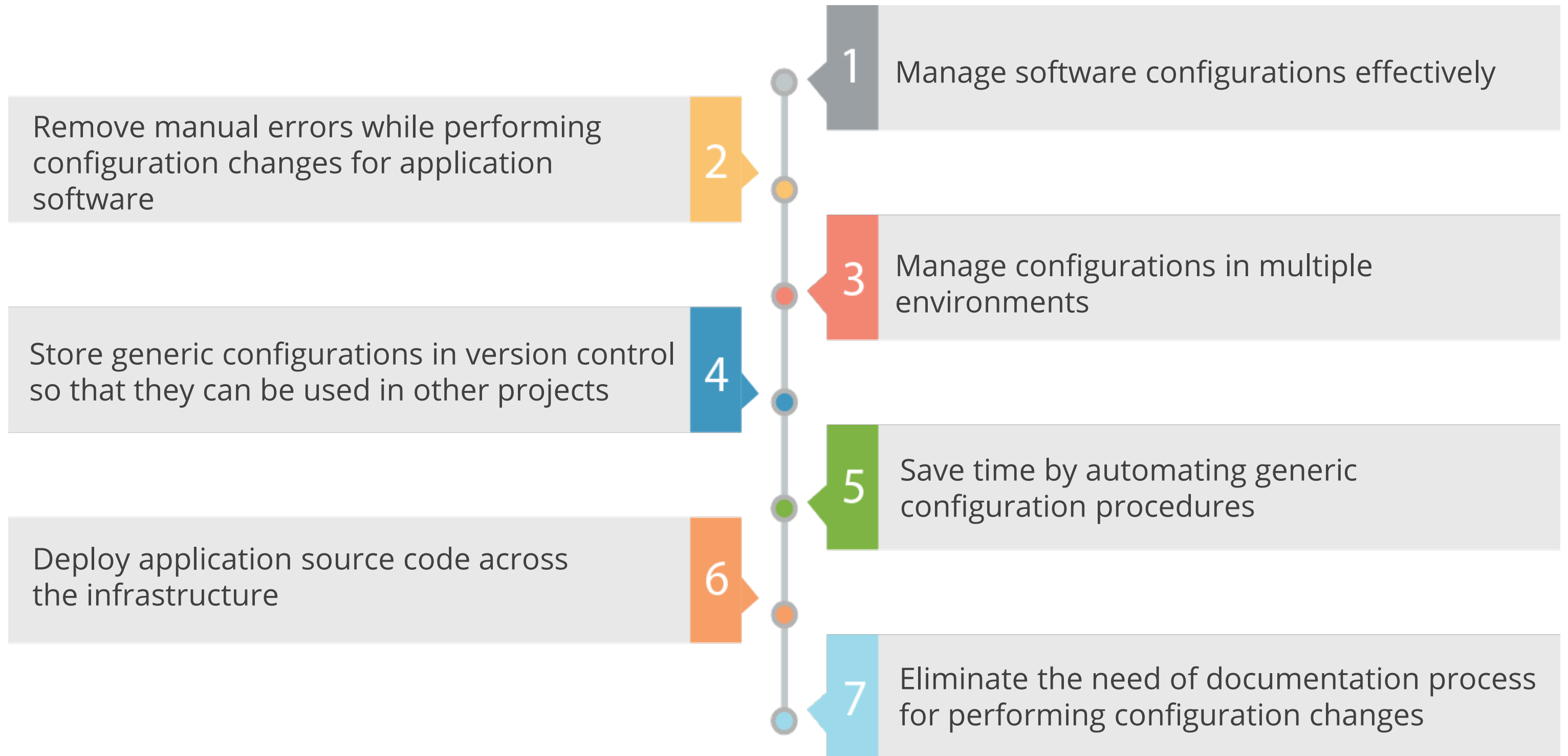
Configuration Management (CM) is a systems engineering process for establishing and maintaining consistency of a product's performance and functional and physical attributes with its requirements, design, and operational information.



Configuration Management Scope

- Configuration management tools manage all configuration items in a software for all environments.
- These configuration items can be software application files, software packages, and software installations which need to be configured for specific environments.
- Configuration management tools cover both software and server configurations.
- They also help reduce the time taken to manage configurations manually on each and every server.

Features of CM Tools



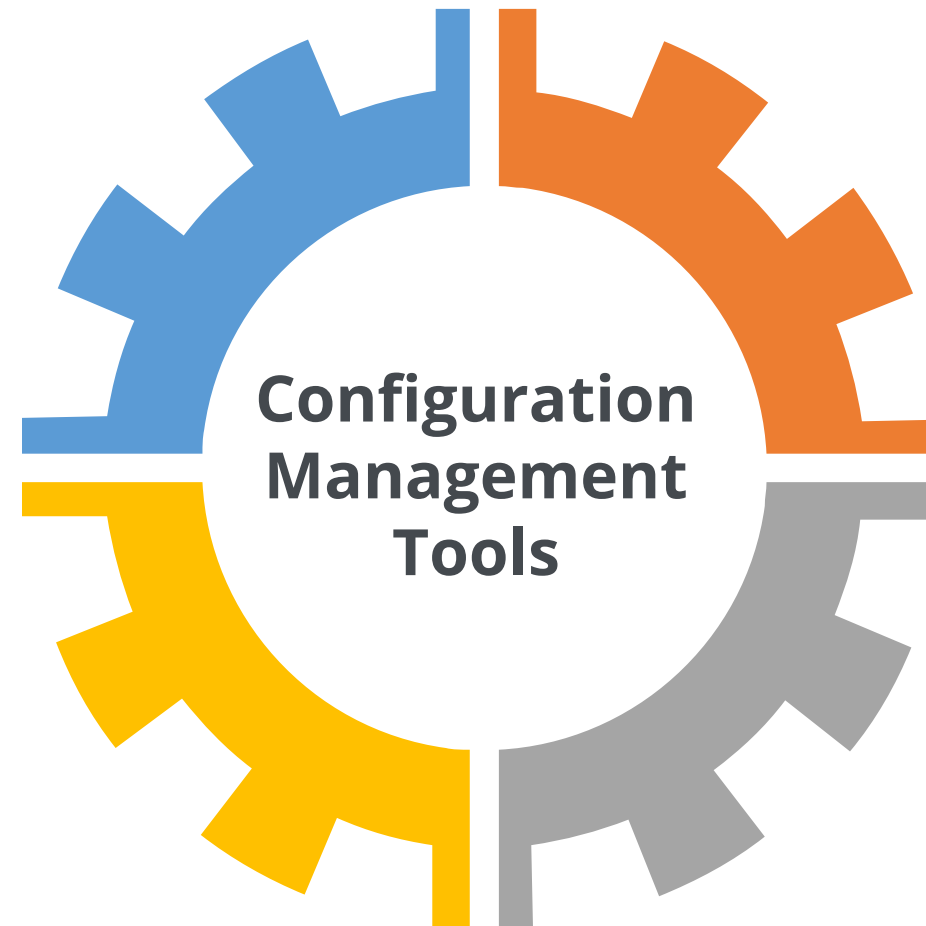
CM Tools

Puppet

Ruby DSL-based CM tool used for managing software, systems, and network configuration items

Ansible

Python-based CM tool, also considered as agentless CM tool



Chef

Ruby-based CM tool having integration with most of the cloud-based platforms

SaltStack

Python-based open-source CM tool used to remotely manage configuration items

CM Process

Configuration Regulation
Regulates the way configuration changes are made for the application software

Configuration Identification
Identifies the correct configuration that needs to be managed by CM tool



Configuration Compliance
Audits and implements compliance on configuration changes made to application software

Role of Infrastructure as Code in CM



Differences between CM Tools

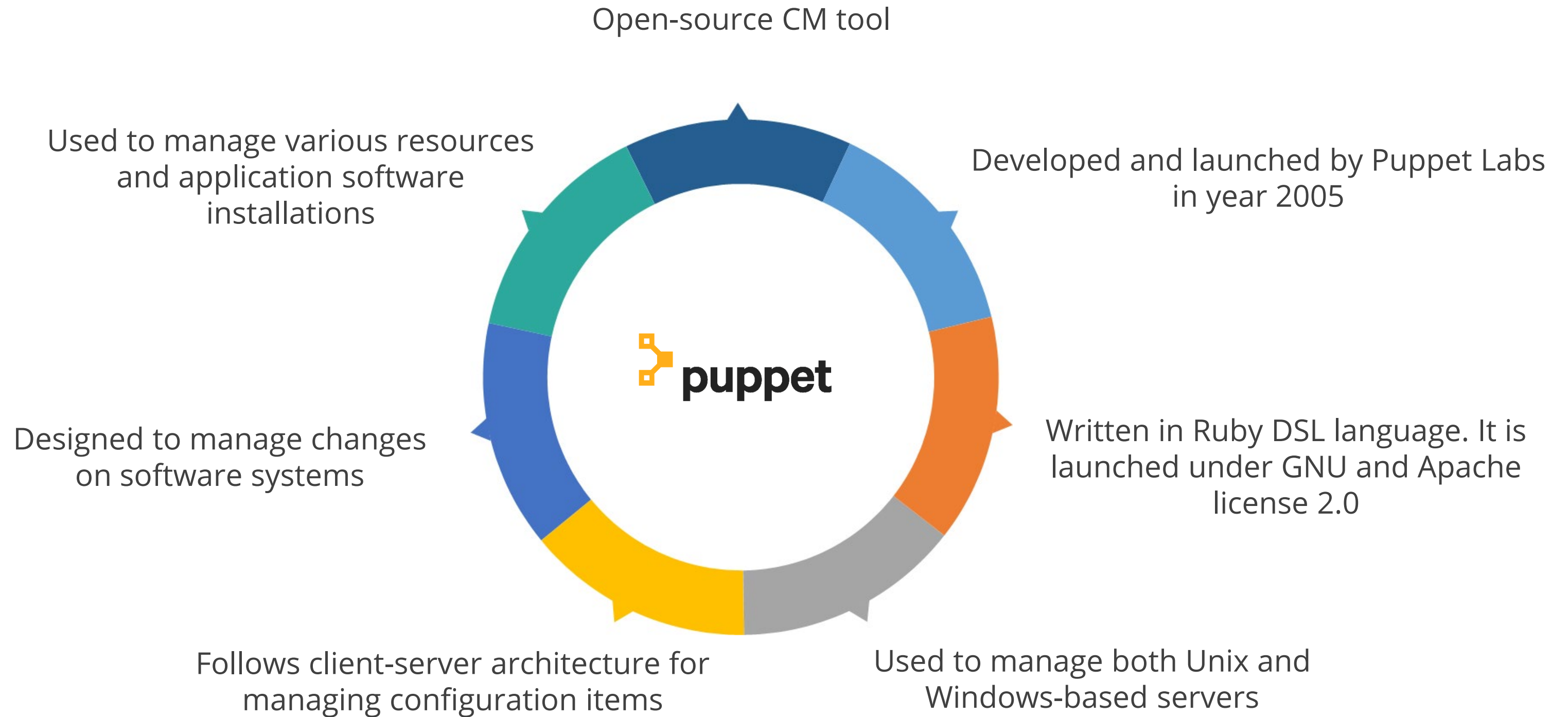
CM Tools	Pros	Cons
Ansible	<ul style="list-style-type: none">• Simple architecture• Low learning curve	<ul style="list-style-type: none">• No Windows support for controller machine• GUI is user friendly as compared to Chef and Puppet
Salt	<ul style="list-style-type: none">• Scalable and fast• Easy to manage	<ul style="list-style-type: none">• GUI is not user friendly
Chef	<ul style="list-style-type: none">• More features• User friendly GUI	<ul style="list-style-type: none">• Needs knowledge of Ruby• Takes more time to understand• Learning curve is more in Chef• Only 10 nodes allowed in open-source license
Puppet	<ul style="list-style-type: none">• Oldest tool in the market• GUI with better features	<ul style="list-style-type: none">• Difficult to understand and configure• Has less number of integrations with other tools

Overview of Chef

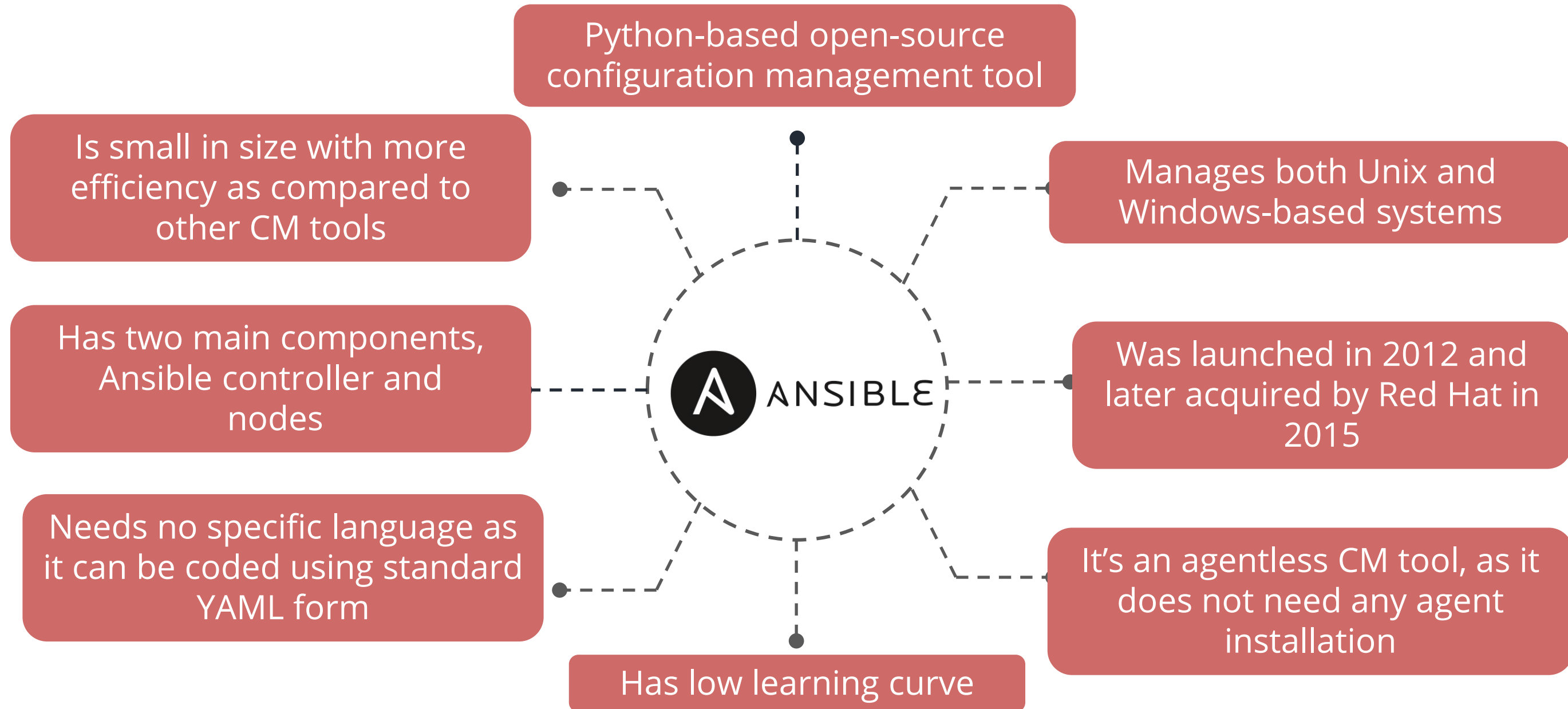
- Chef was developed in Ruby and Erlang languages. It was initially launched in year 2009.
- It uses pure Ruby DSL-based language for managing system resources.
- Its extensive integration with the latest cloud platforms like AWS GoogleCloud allows it to run in both client-server and solo architecture managing infra and software resources.
- It manages both Unix-based and Windows-based systems.



Overview of Puppet



Overview of Ansible



Key Takeaways

- DevOps helps development and operations team to work in a collaborative manner.
- Configuration management tools manage all configuration items in a software for all environments.
- Agile and DevOps help in rapid development with less bugs in the product.





Knowledge Check

Knowledge Check

1

Which of the following is a part of the operations phase in DevOps?

- A. Plan
- B. Verify
- C. Configure
- D. Package



Knowledge Check

1

Which of the following is a part of the operations phase in DevOps?

- A. Plan
- B. Verify
- C. Configure
- D. Package



The correct answer is **C**

Configure is a part of the operations phase in DevOps.

Knowledge Check

2

Which of the following activity is NOT a DevOps principle?

- A. Continuous improvement
- B. Optimal customer support
- C. Automate everything you can
- D. Cross-functional autonomous teams



Knowledge Check

2

Which of the following activity is NOT a DevOps principle?

- A. Continuous improvement
- B. Optimal customer support
- C. Automate everything you can
- D. Cross-functional autonomous teams



The correct answer is **B**

Customer support is not a DevOps principle.

Knowledge Check

3

Which of the following is a CM tool?

- A. Ansible
- B. Chef
- C. Puppet
- D. All of the above



Knowledge Check

3

Which of the following is a CM tool?

- A. Ansible
- B. Chef
- C. Puppet
- D. All of the above



The correct answer is **D**

Chef, Puppet, and Ansible are CM tools.

Knowledge Check

4

Which of the following are stages in the CM process flow?

- A. Identification
- B. Regulation
- C. Compliance
- D. All of the above



Knowledge Check

4

Which of the following are stages in the CM process flow?

- A. Identification
- B. Regulation
- C. Compliance
- D. All of the above



The correct answer is **D**

Identification, regulation, and compliance are part of the CM process flow.