



# DevOps

# Software Development Lifecycle



## PLANNING

Talk to customer  
and understand  
the  
requirements



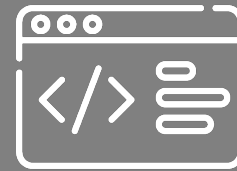
## DEFINING

Define the  
requirements  
and stick to  
them



## DESIGNING

Design the  
solution with  
right approach



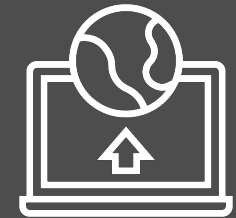
## BUILDING

Development  
following  
guidelines



## TESTING

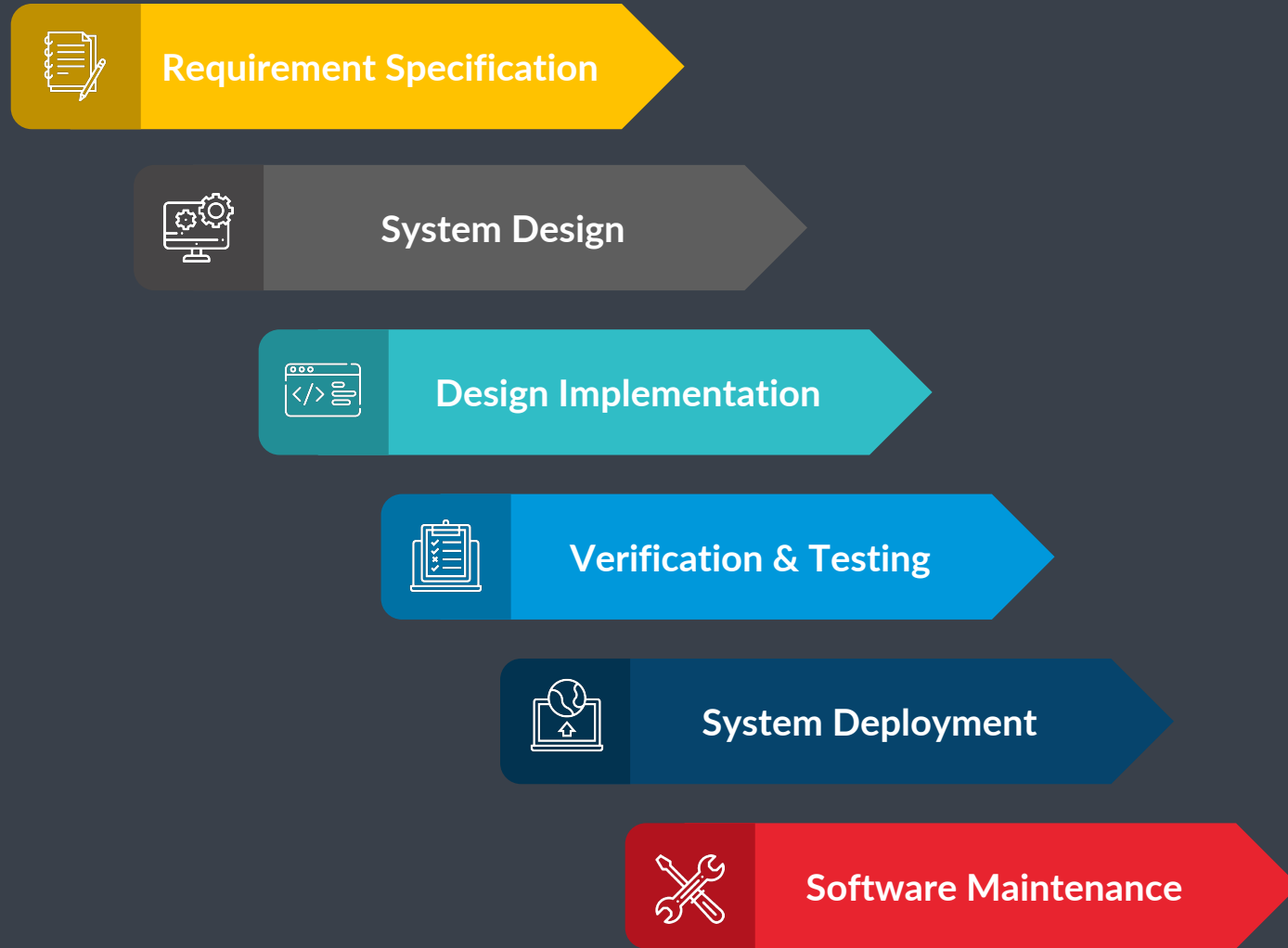
Make sure that  
your code is  
working



## DEPLOYMENT

Make your app  
available for rest  
of the world

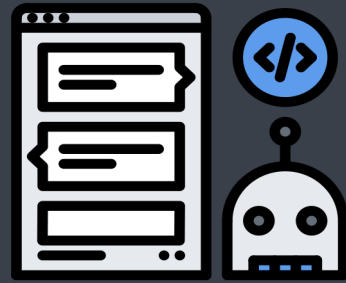
# Waterfall Model



# Entities involved



Developer



Testers



Operations Team

# Responsibilities



## Developers and Testers



- Developers
  - Develop the application
  - Package the application
  - Fix the bugs
  - Maintain the application
- Testers
  - Thoroughly test the application manually or using test automation
  - Report the bugs to the developer

## Operations Team

- Make all the necessary resources ready
- Deploy the application
- Maintain multiple environments
- Continuously monitor the application
- Manage the resources



# Challenges



## Developers and Testers

- The process is slow
- The pressure to work on the newer features and fix the older code
- Not flexible

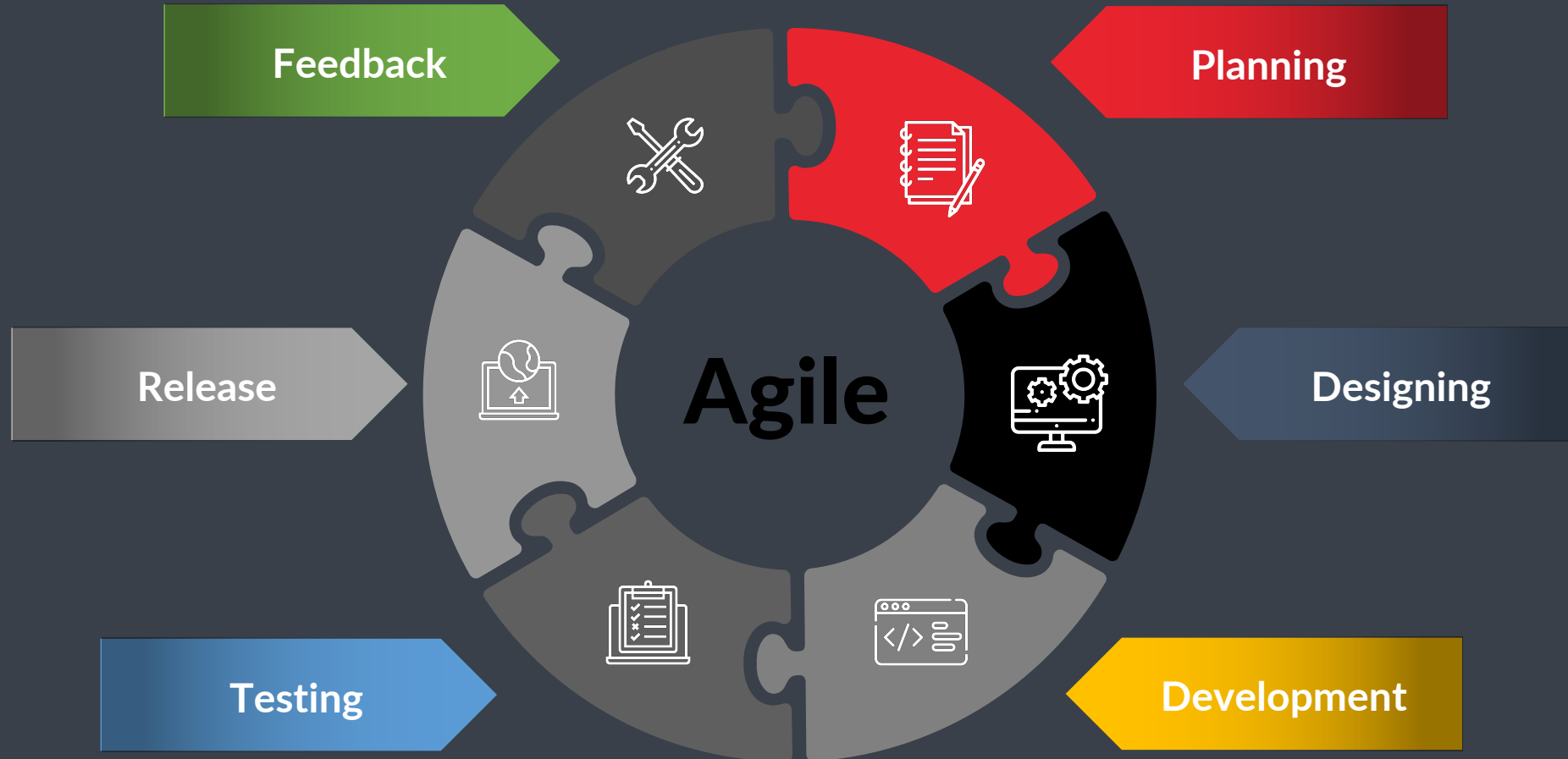


## Operations Team

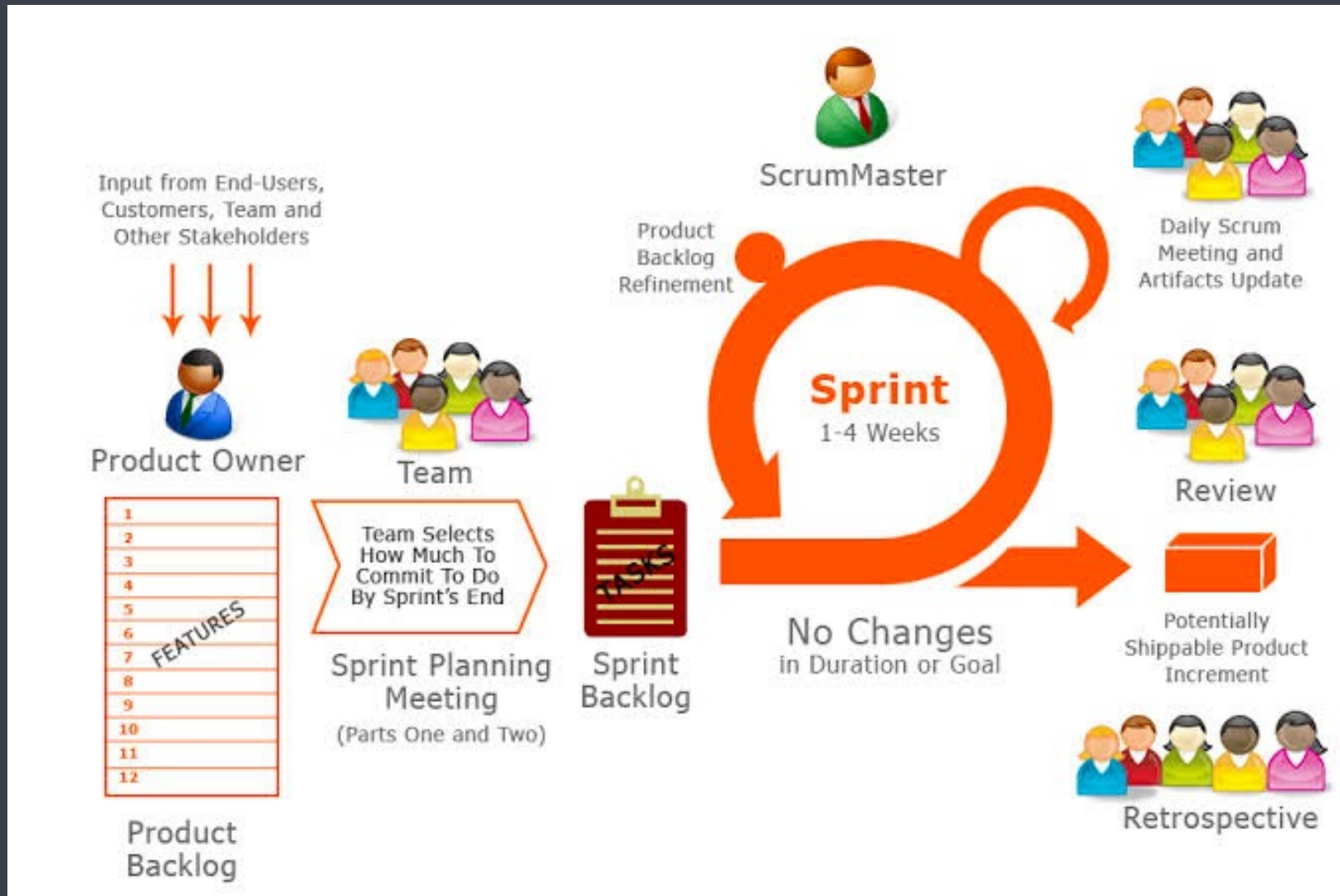
- Uptime
- Configure the huge infrastructure
- Diagnose and fix the issue



# Agile Development



# Scrum Process





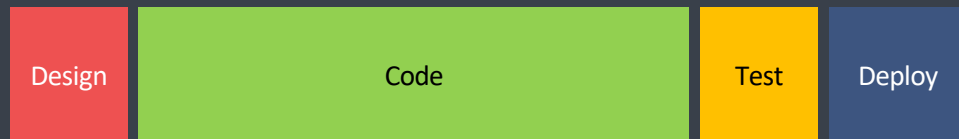
# Waterfall Vs Agile



The Waterfall Process



This project has got so big.  
I am not sure I will be able to deliver it!



The Agile Process



It is so much better delivering  
this project in bite-sized sections



# Problems



- Managing and tracking changes in the code is difficult
- Incremental builds are difficult to manage, test and deploy
- Manual testing and deployment of various components/modules takes a lot of time
- Ensuring consistency, adaptability and scalability across environments is very difficult task
- Environment dependencies makes the project behave differently in different environments



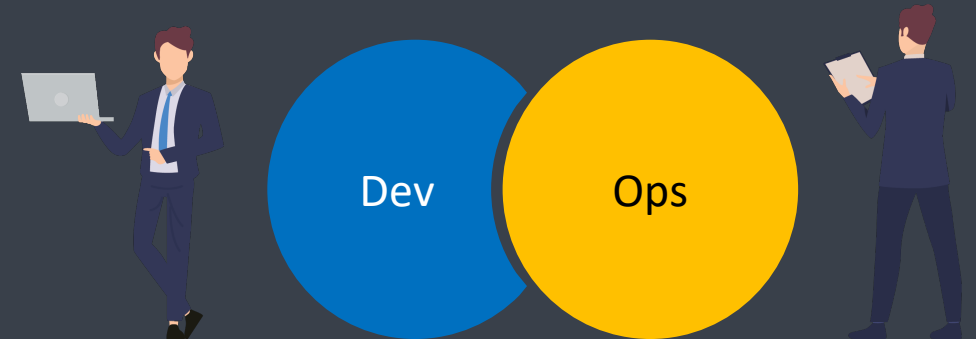
## Solutions to the problem

- Managing and tracking changes in the code is difficult: **SCM tools**
- Incremental builds are difficult to manage, test and deploy: **Jenkins**
- Manual testing and deployment of various components/modules takes a lot of time: **Selenium**
- Ensuring consistency, adaptability and scalability across environments is very difficult task: **Puppet**
- Environment dependencies makes the project behave differently in different environments: **Docker**

# What is DevOps ?



- DevOps is a combination of two words development and operations
- Promotes collaboration between Development and Operations Team to deploy code to production faster in an automated & repeatable way
- DevOps helps to increase an organization's speed to deliver applications and services
- It allows organizations to serve their customers better and compete more strongly in the market
- Can be defined as an alignment of development and IT operations with better communication and collaboration
- DevOps is not a goal but a never-ending process of continuous improvement
- It integrates Development and Operations teams
- It improves collaboration and productivity by
  - Automating infrastructure
  - Automating workflow
  - Continuously measuring application performance





# Why DevOps is Needed?

- Before DevOps, the development and operation team worked in complete isolation
- Testing and Deployment were isolated activities done after design-build. Hence they consumed more time than actual build cycles.
- Without using DevOps, team members are spending a large amount of their time in testing, deploying, and designing instead of building the project.
- Manual code deployment leads to human errors in production
- Coding & operation teams have their separate timelines and are not in synch causing further delays



# Common misunderstanding

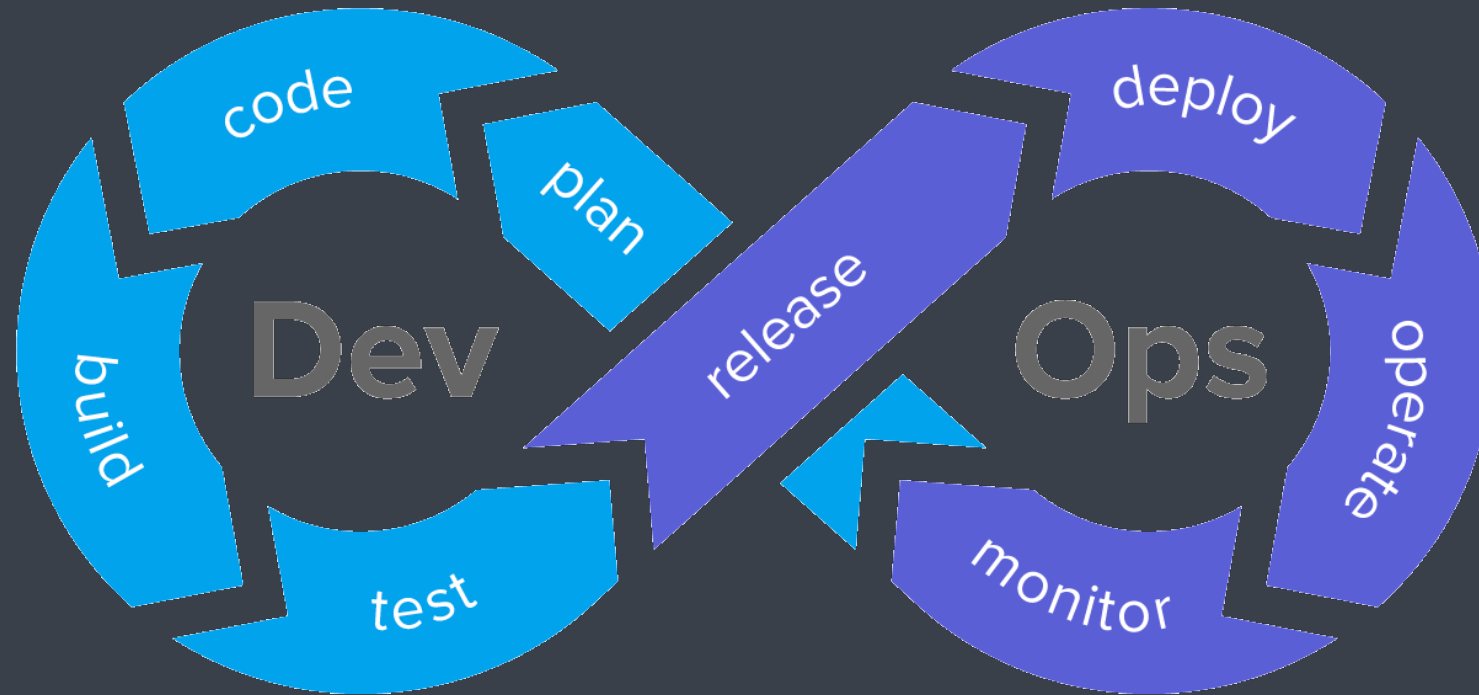
- DevOps is not a role, person or organization
- DevOps is not a separate team
- DevOps is not a product or a tool
- DevOps is not just writing scripts or implementing tools

# Reasons to use DevOps



- **Predictability**
  - DevOps offers significantly lower failure rate of new releases
- **Reproducibility**
  - Version everything so that earlier version can be restored anytime
- **Maintainability**
  - Effortless process of recovery in the event of a new release crashing or disabling the current system
- **Time to market**
  - DevOps reduces the time to market up to 50% through streamlined software delivery
  - This is particularly the case for digital and mobile applications
- **Greater Quality**
  - DevOps helps the team to provide improved quality of application development as it incorporates infrastructure issues
- **Reduced Risk**
  - DevOps incorporates security aspects in the software delivery lifecycle. It helps in reduction of defects across the lifecycle
- **Resiliency**
  - The Operational state of the software system is more stable, secure, and changes are auditable

# DevOps Lifecycle

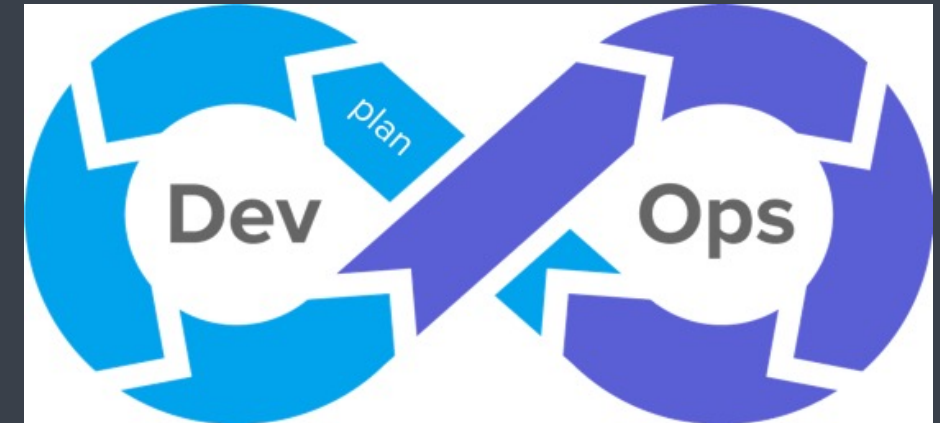
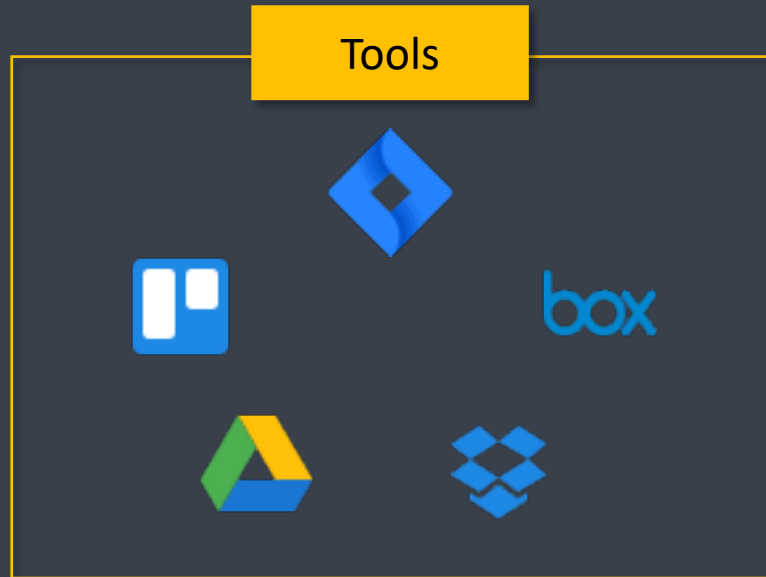




# DevOps Lifecycle - Plan



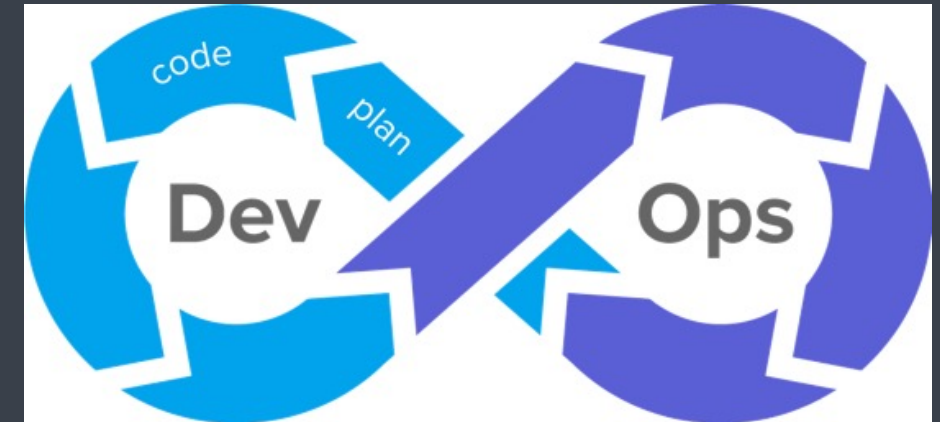
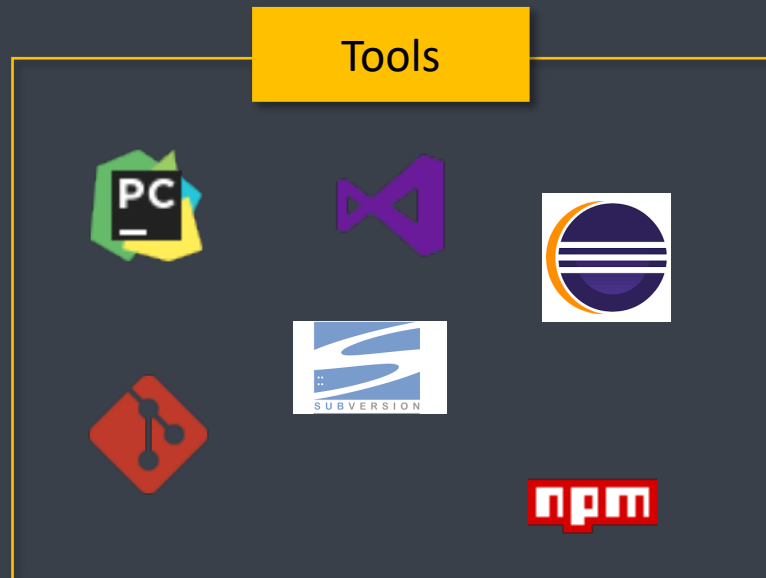
- First stage of DevOps lifecycle where you plan, track, visualize and summarize your project before you start working on it



# DevOps Lifecycle - Code



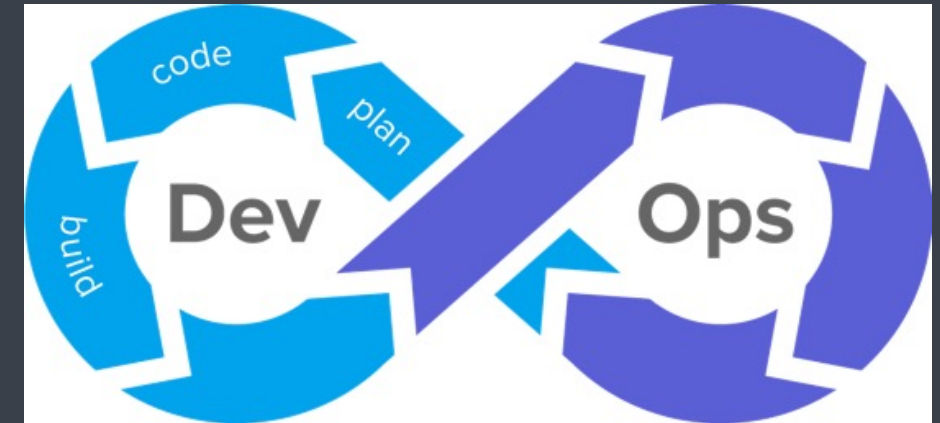
- Second stage where developer writes the code using favorite programming language





# DevOps Lifecycle -Build

- Integrating the required libraries
- Compiling the source code
- Create deployable packages

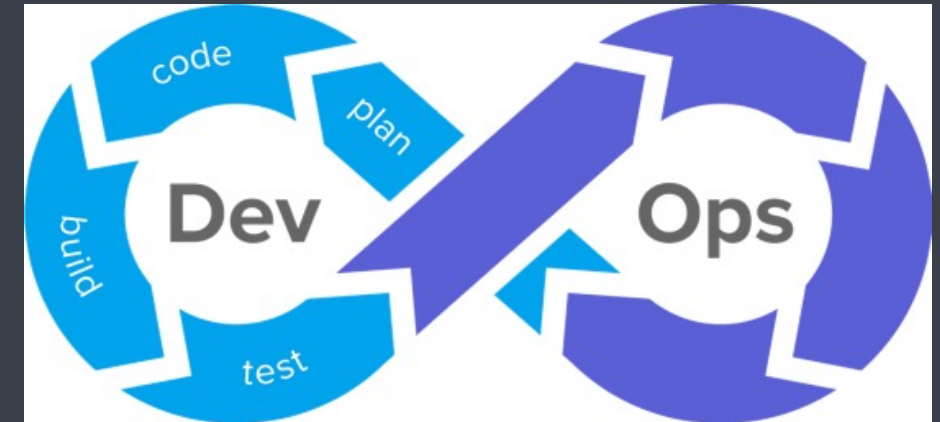


# DevOps Lifecycle - Test



- Process of executing automated tests
- The goal here is to get the feedback about the changes as quickly as possible

## Tools

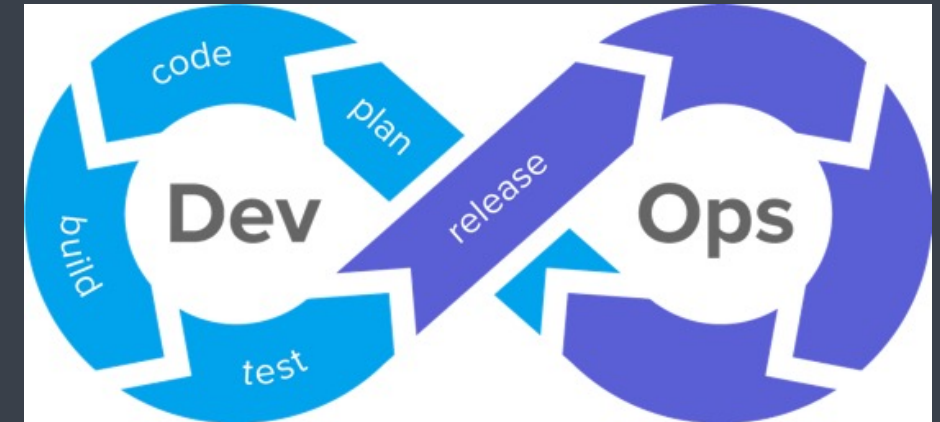


# DevOps Lifecycle - Release



- This phase helps to integrate code into a shared repository using which you can detect and locate errors quickly and easily

Tools

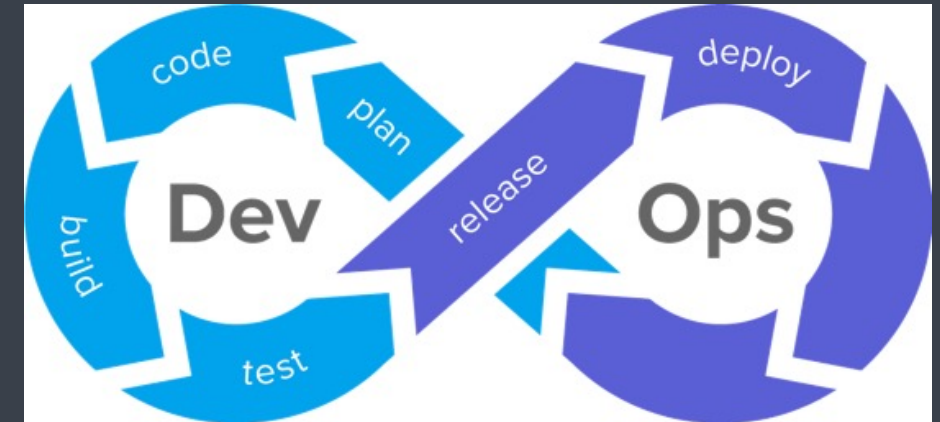


# DevOps Lifecycle - Deploy



- Manage and maintain development and deployment of software systems and server in any computational environment

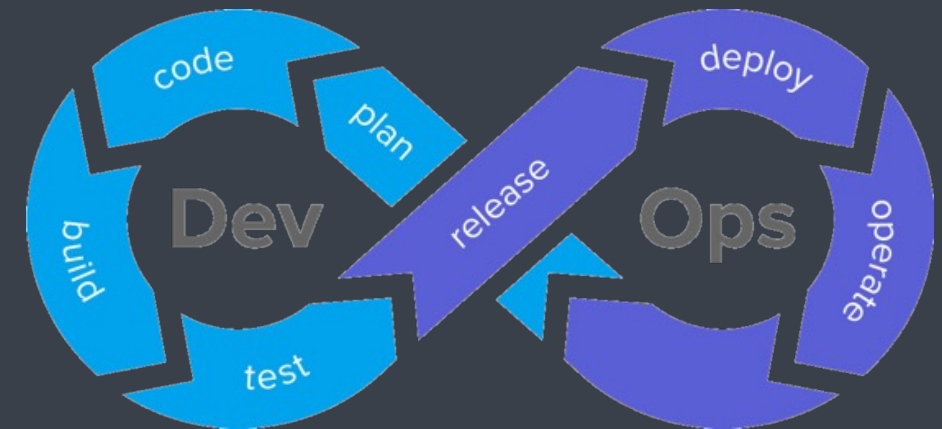
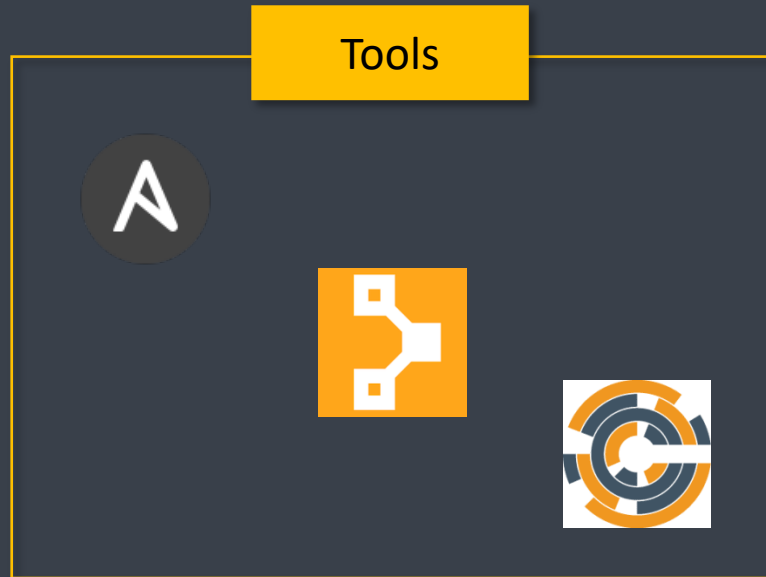
## Tools



# DevOps Lifecycle - Operate



- This stage where the updated system gets operated



# DevOps Lifecycle - Monitor



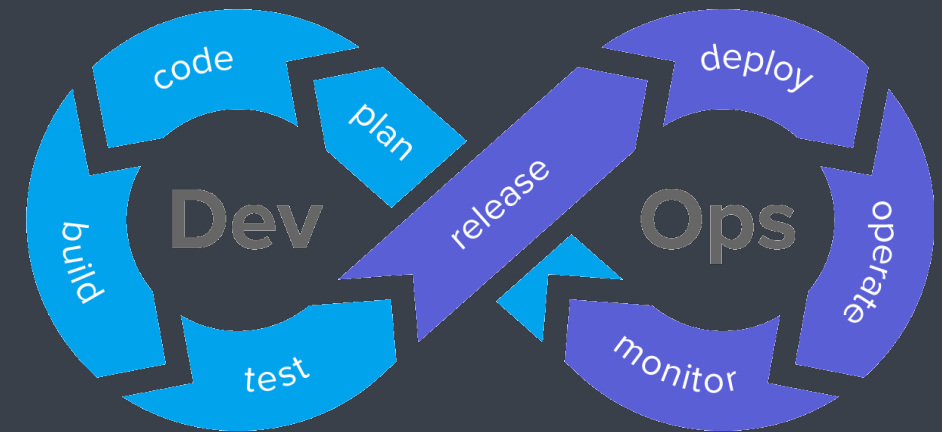
- It ensures that the application is performing as expected and the environment is stable
- It quickly determines when a service is unavailable and understand the underlying causes

## Tools

splunk>

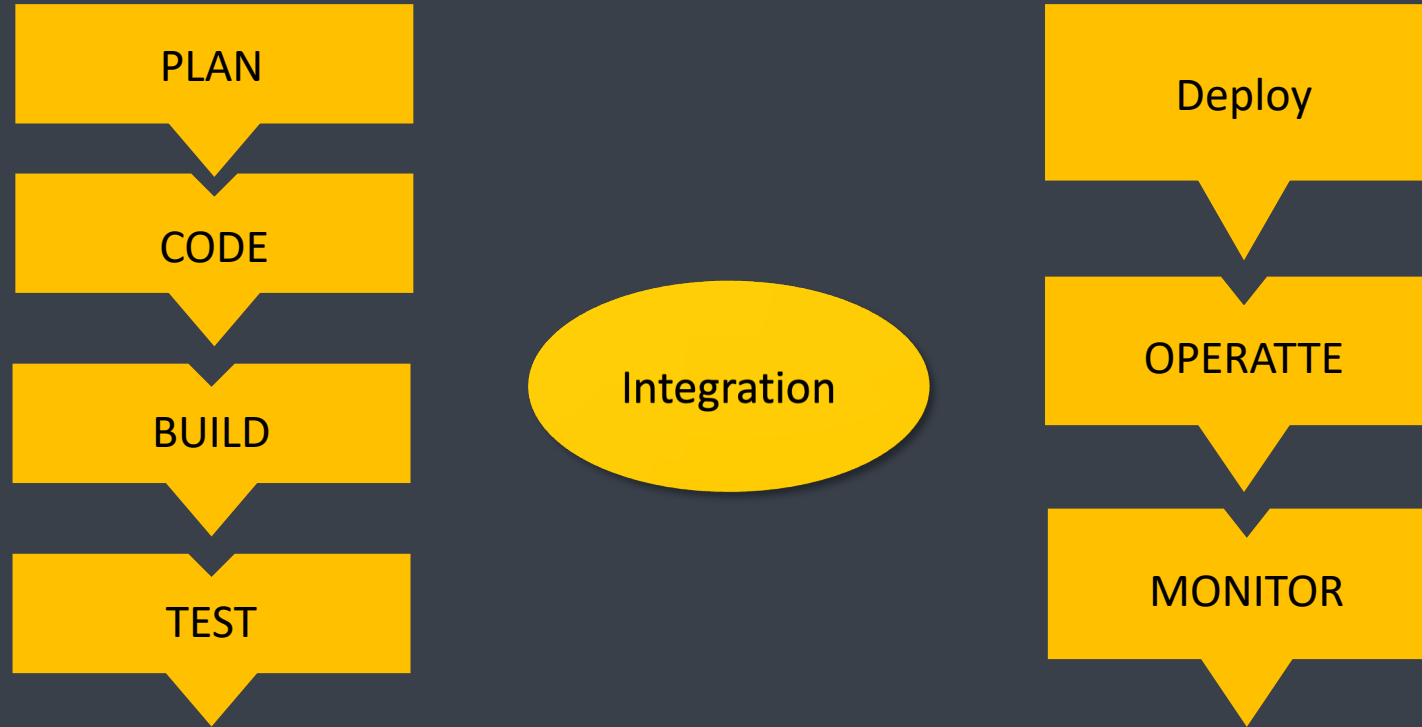


**Nagios®**

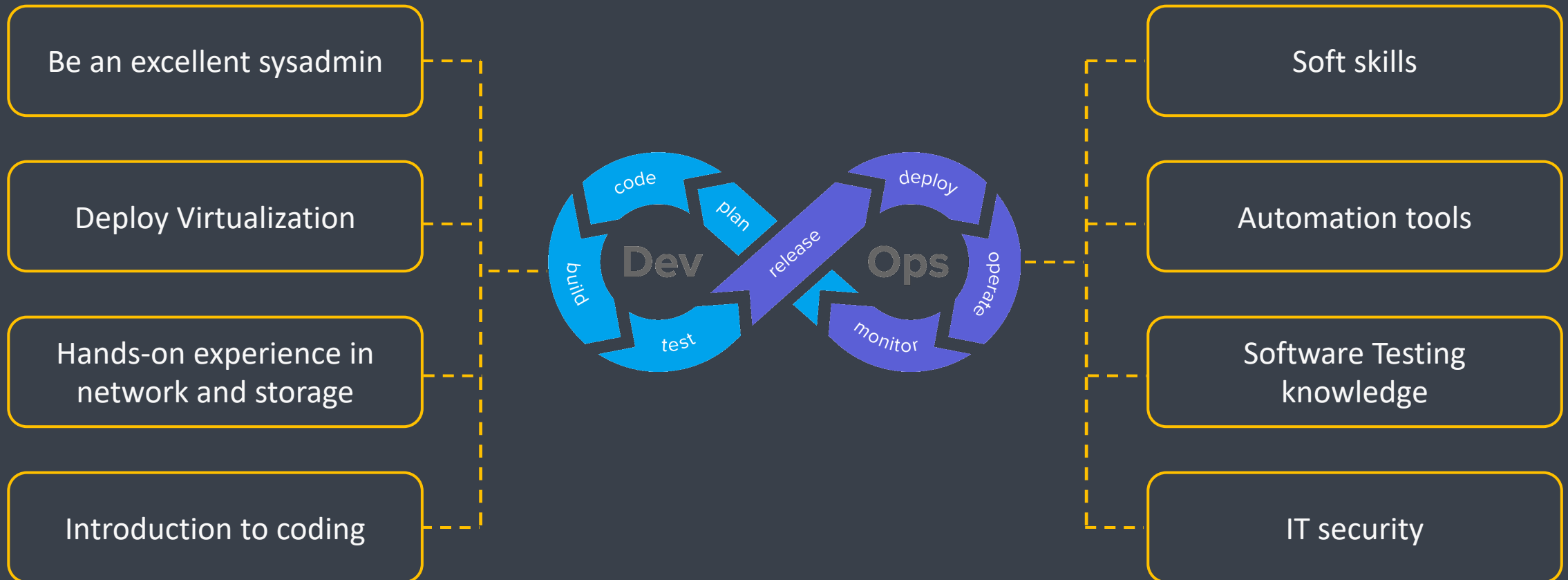




# DevOps Terminologies



# Responsibilities of DevOps Engineer



# Skills of a DevOps Engineer



Skills	Description
Tools	<ul style="list-style-type: none"><li>• Version Control – Git/SVN</li><li>• Continuous Integration – Jenkins</li><li>• Virtualization / Containerization – Docker/Kubernetes</li><li>• Configuration Management – Puppet/Chef/Ansible</li><li>• Monitoring – Nagios/Splunk</li></ul>
Network Skills	<ul style="list-style-type: none"><li>• General Networking Skills</li><li>• Maintaining connections/Port Forwarding</li></ul>
Other Skills	<ul style="list-style-type: none"><li>• Cloud: AWS/Azure/GCP</li><li>• Soft Skills</li><li>• People management skill</li></ul>