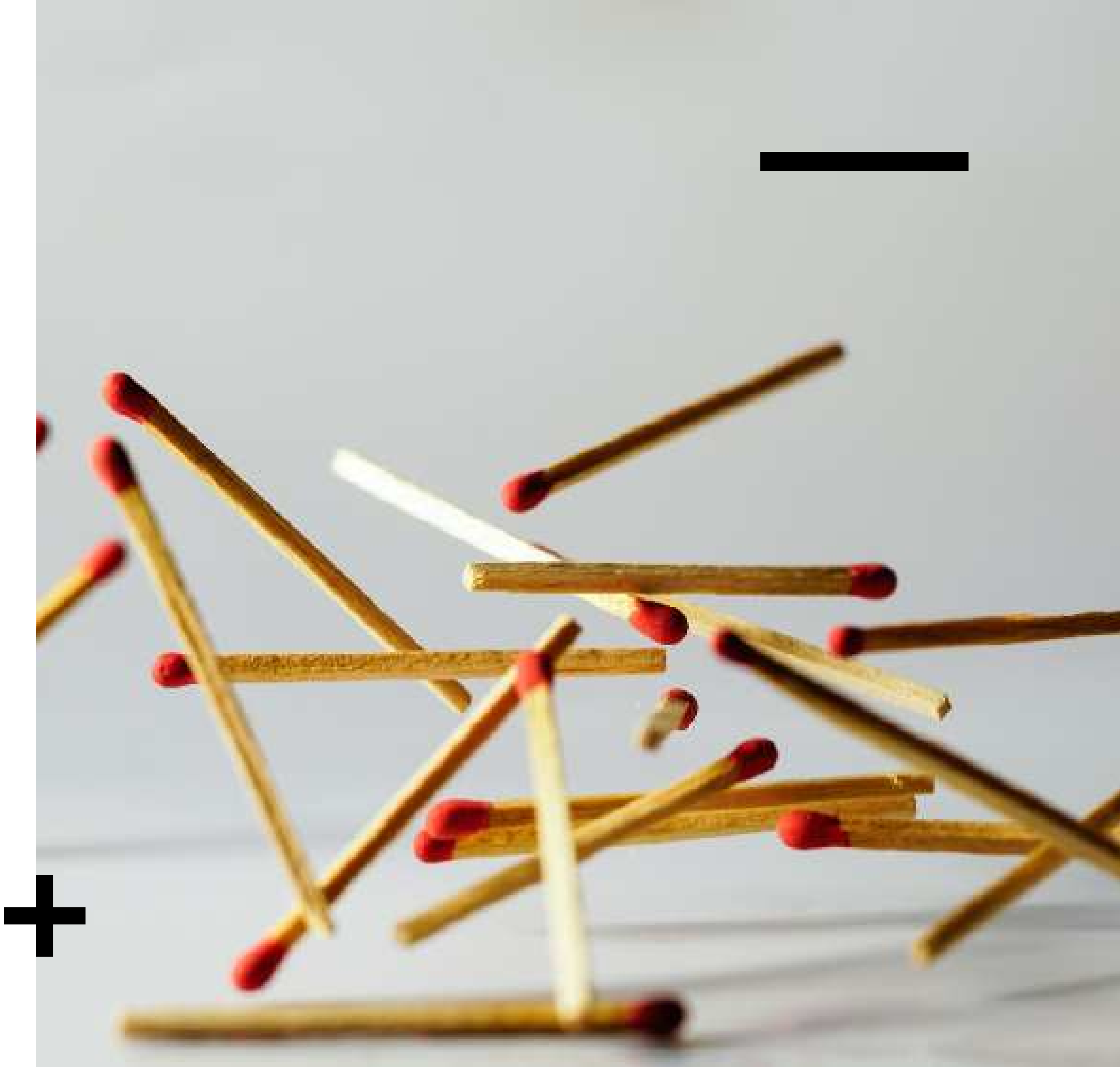
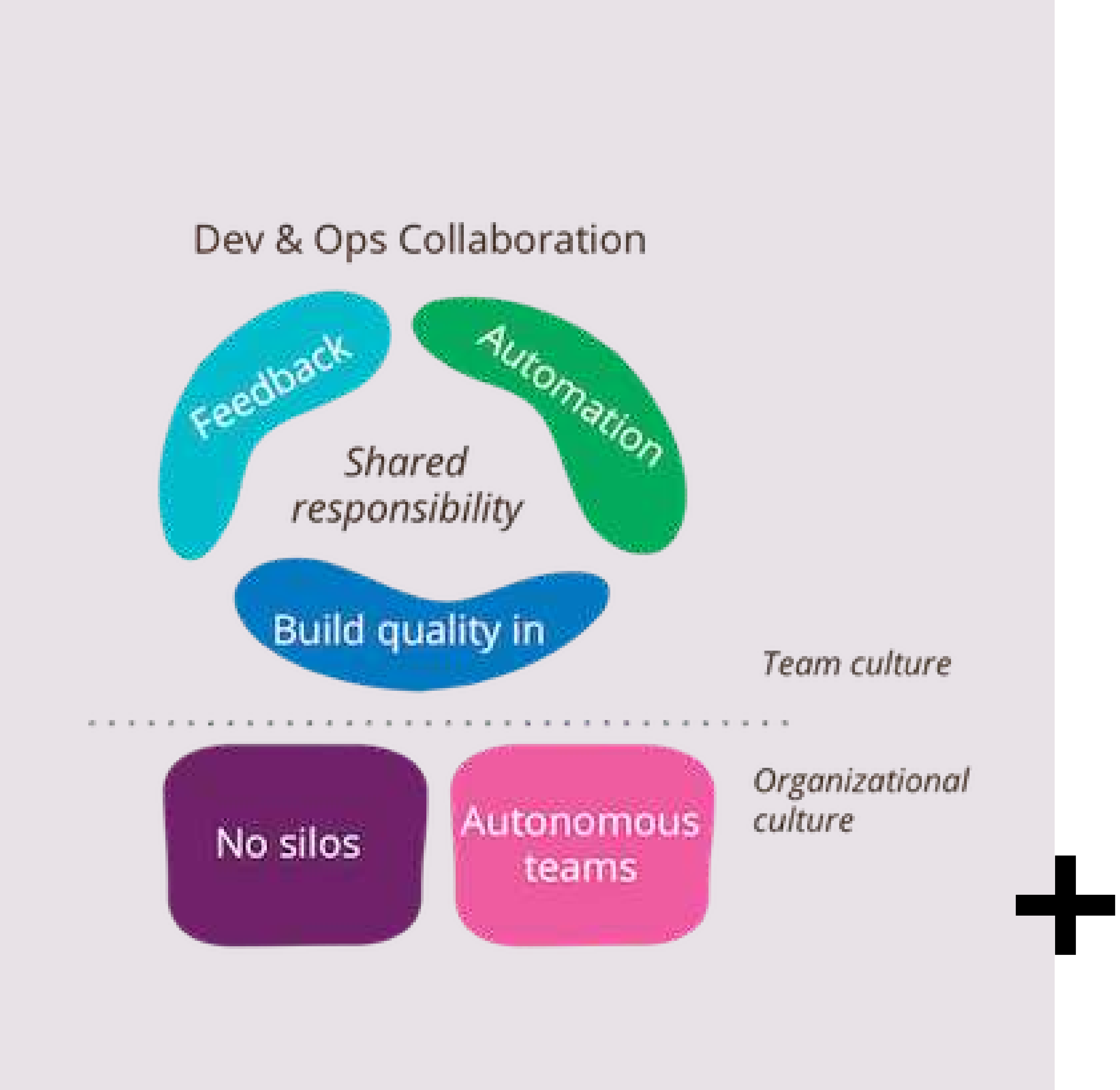
# Introduce DevOps pipeline

Thang Nguyen



# What is DevOps



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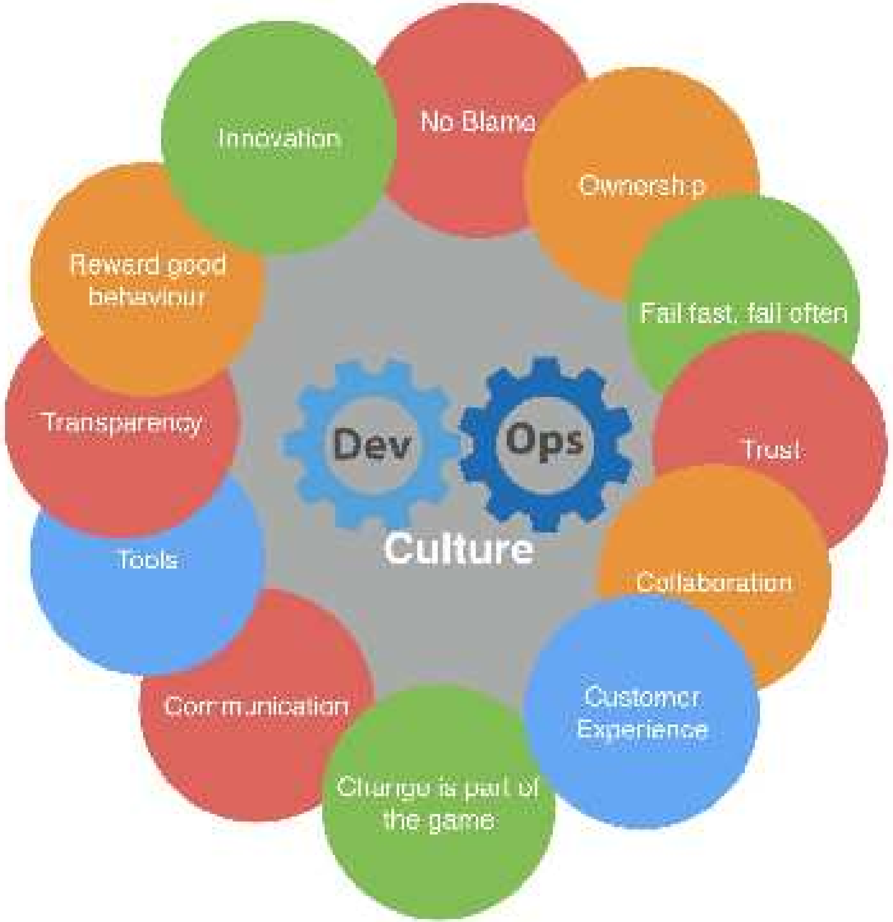

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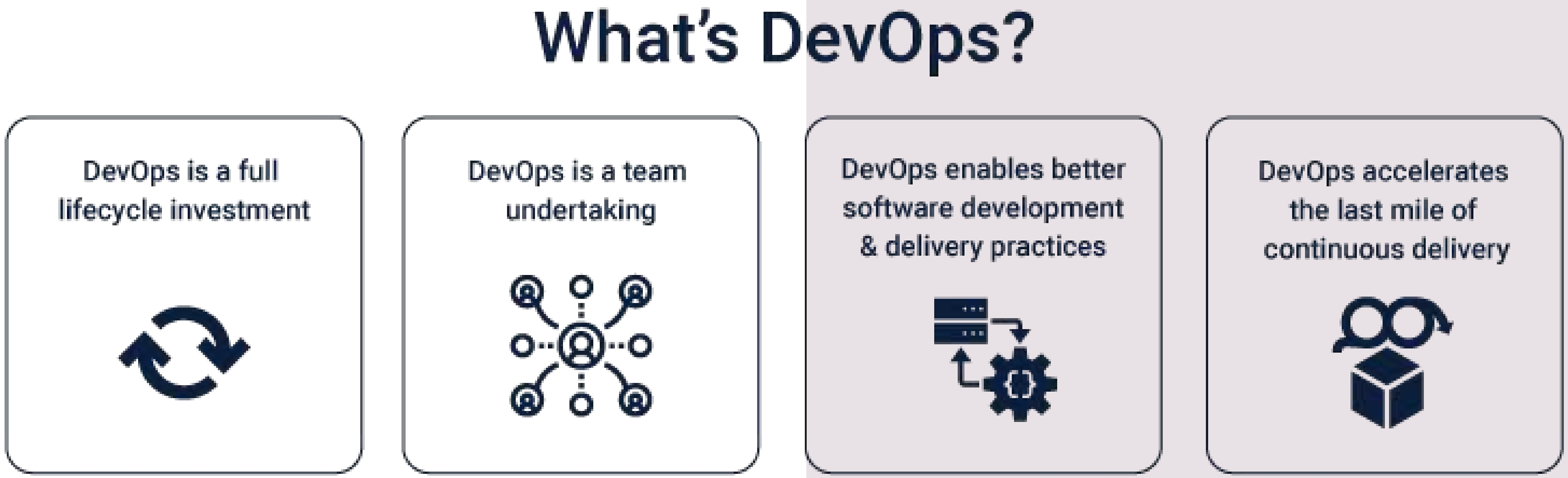


## What's DevOps?

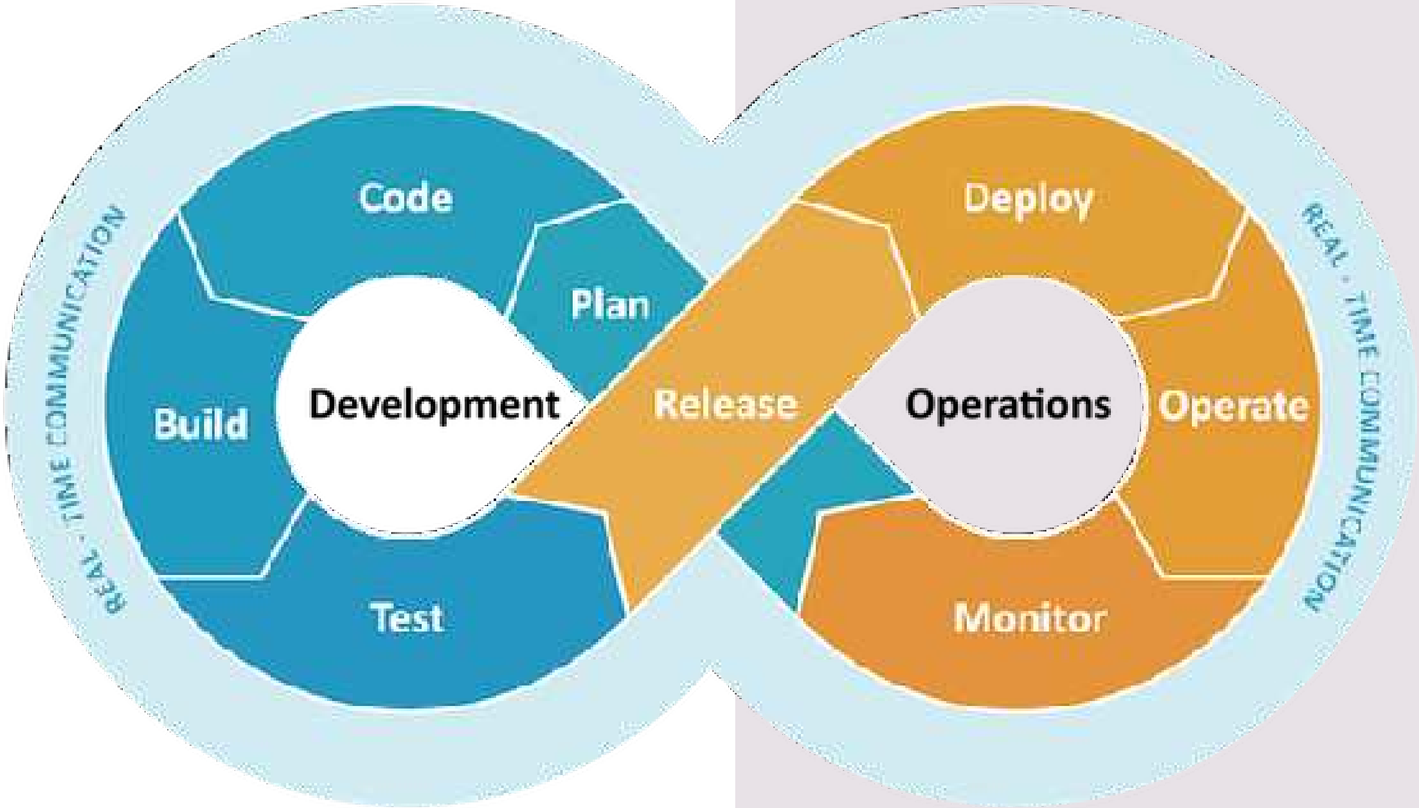
DevOps is a full lifecycle investment

DevOps is a team undertaking

DevOps enables better software development & delivery practices

DevOps accelerates the last mile of continuous delivery

# What is DevOps



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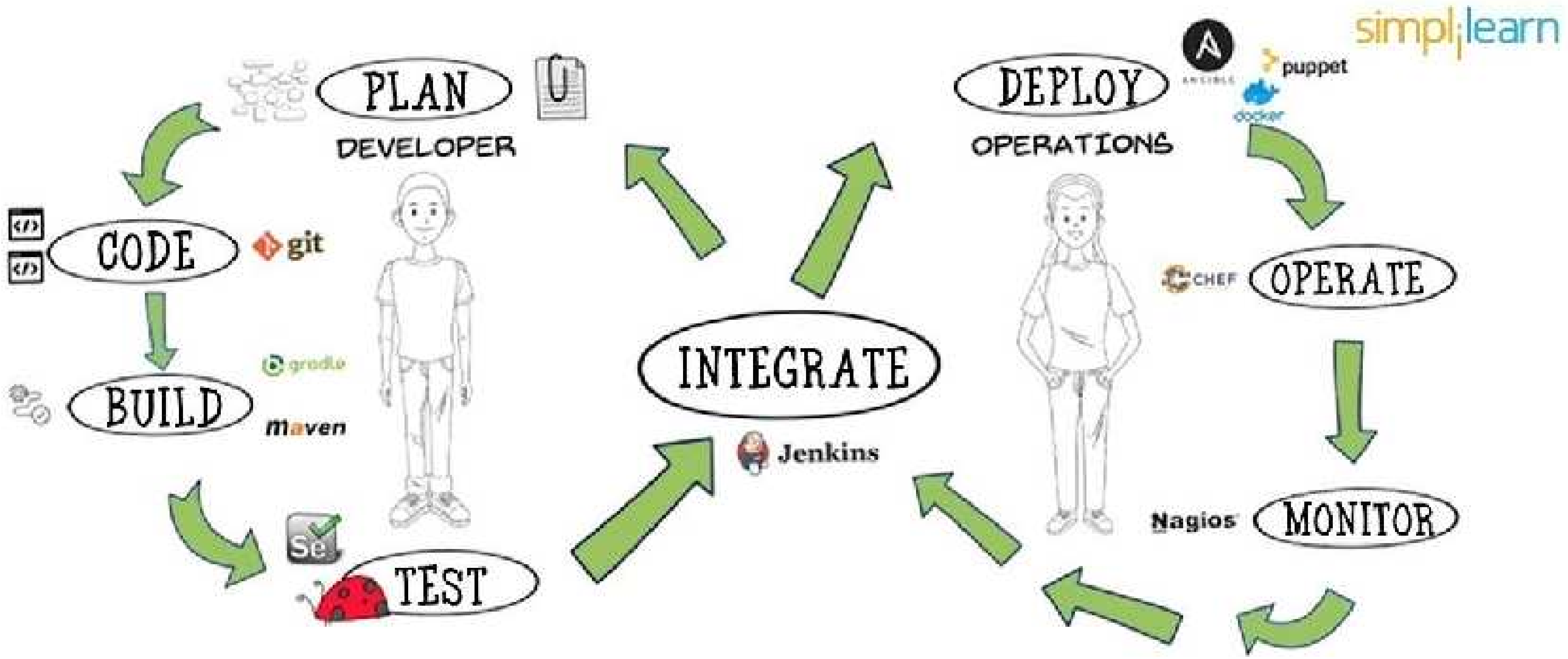

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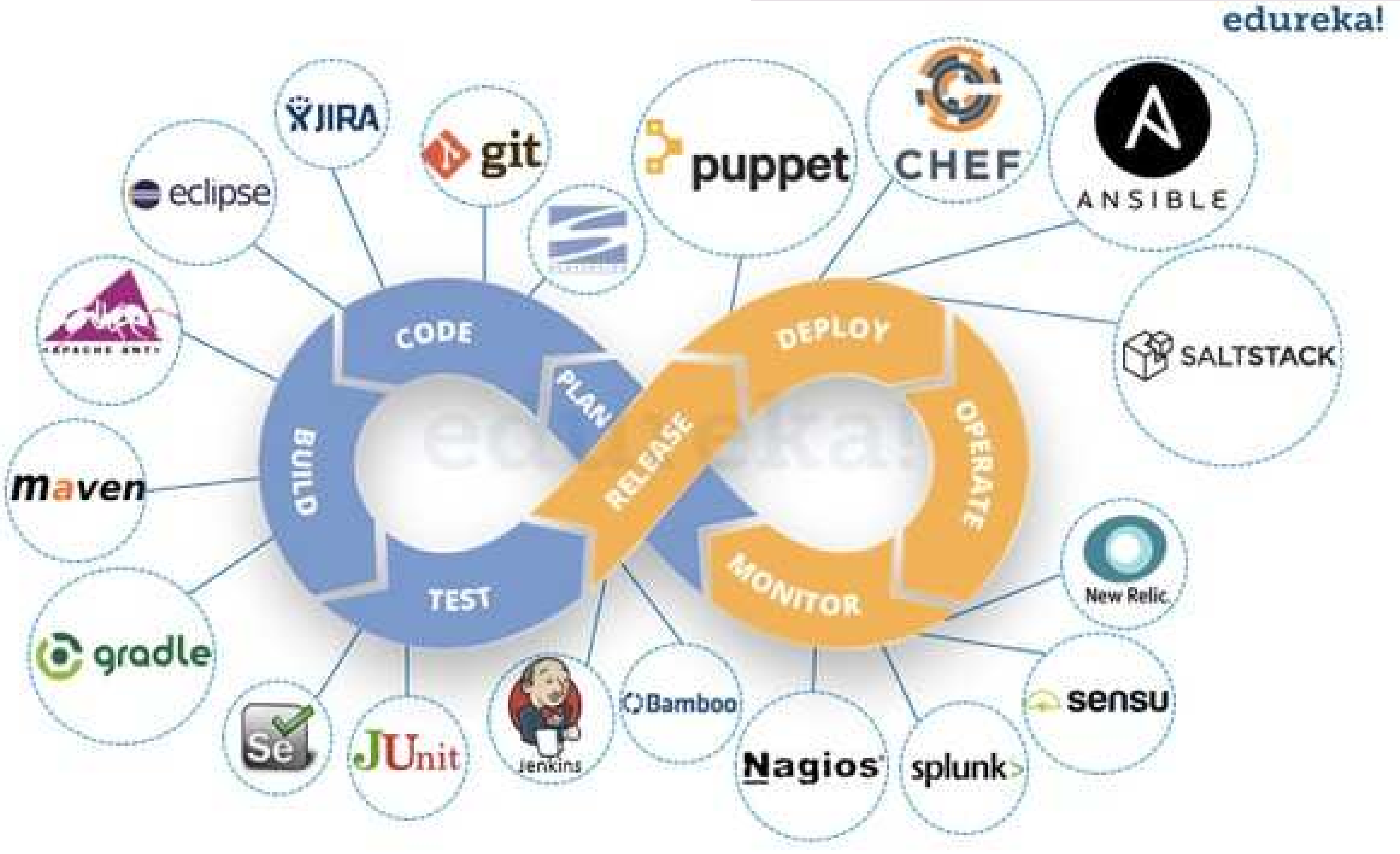


# What we need?

- **Learn the culture**
  - Concept
  - Motivation
  - Factor Influencing
  - Barriers

# What we need?

- **Learn Server Administrator**
  - Linux OS
  - Linux Commands
  - File, permission, network
  - …

# What we need?

- **Learn Webserver, Network, Protocol**
  - TCP/IP
  - SSL, SSH, FTP…
  - Firewall, Load Balancer
  - Apache, Tomcat, IIS,…

# What we need?

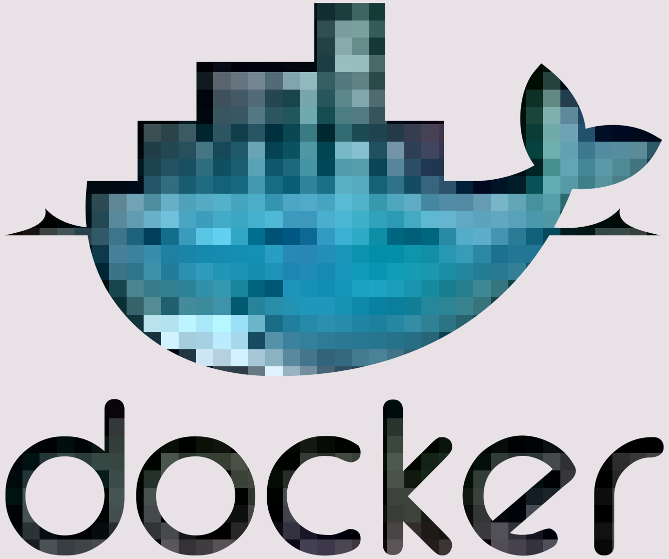
- **Learn Scripting & Programing language**
  - IaC
  - PaC
  - Other languages

# What we need?

- **Learn Git**
  - Best of SCM

# What we need?

- **Learn Container Architect**
  - Docker
  - K8s
  - Rancher



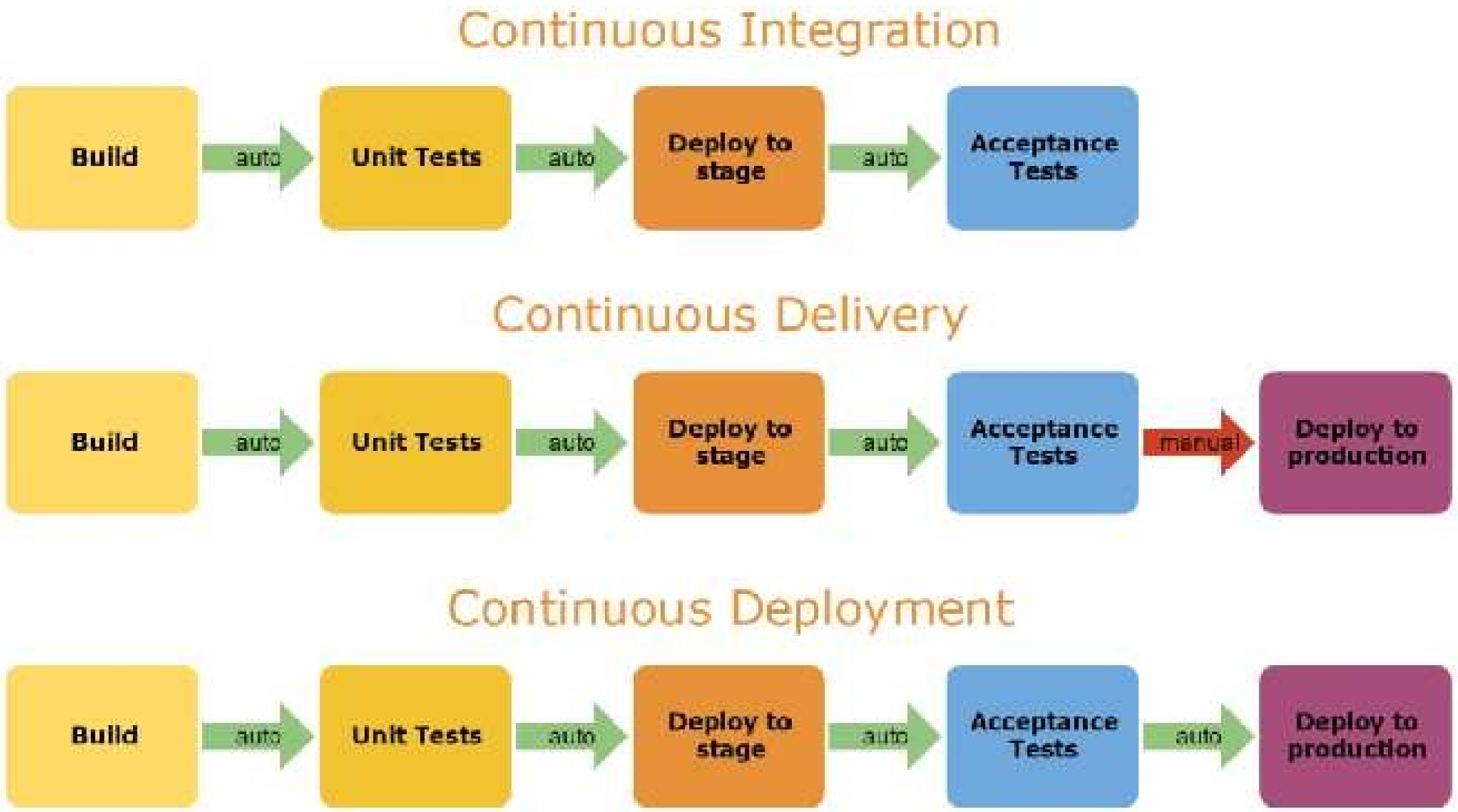
# What we need?

- **Learn Configuration Mgmt**
  - Ansible
  - Chef
  - Puppet

# What we need?

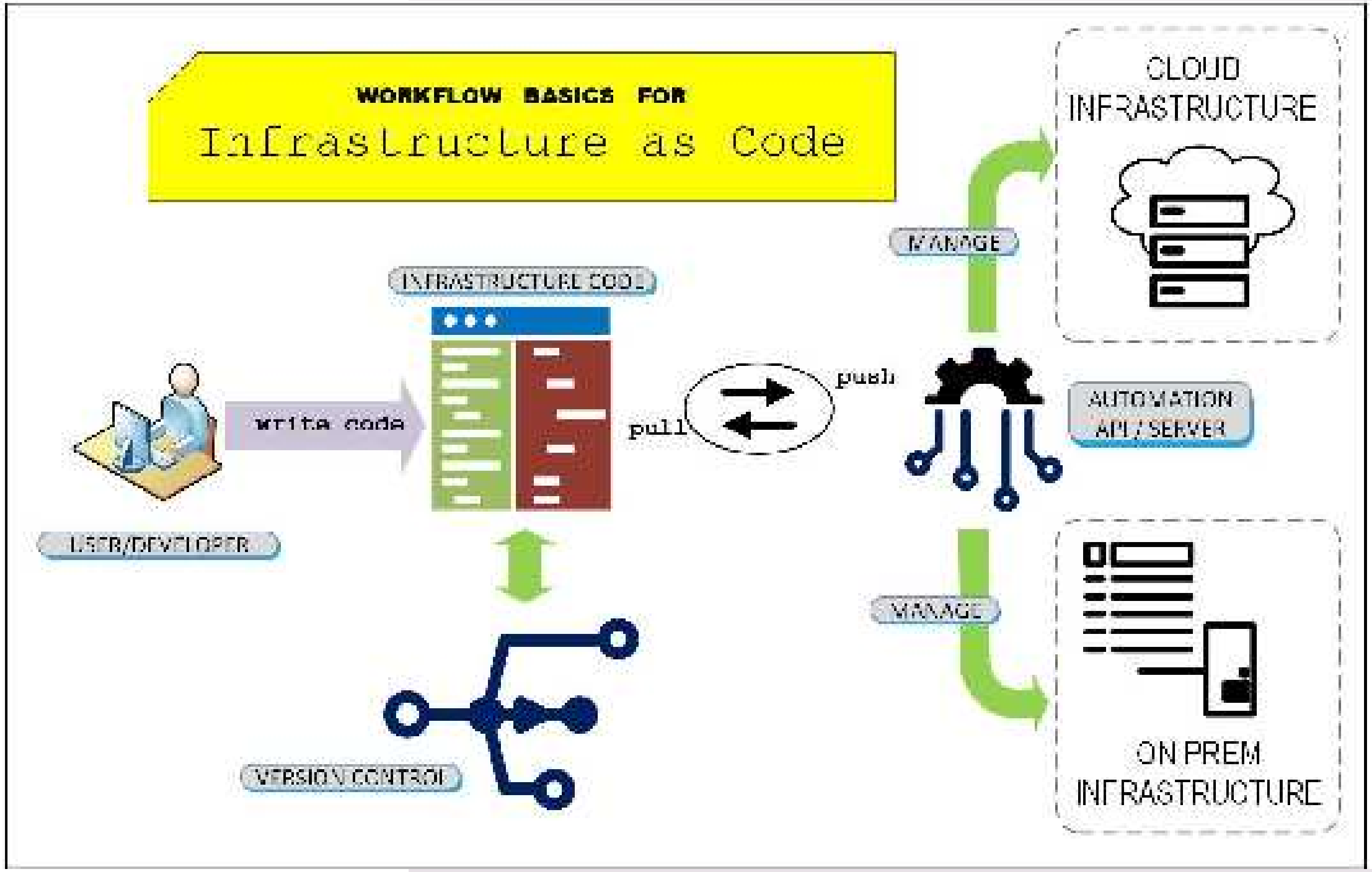
- **Learn Cloud IaC**
  - Google Cloud
  - AWS

# CI/CD

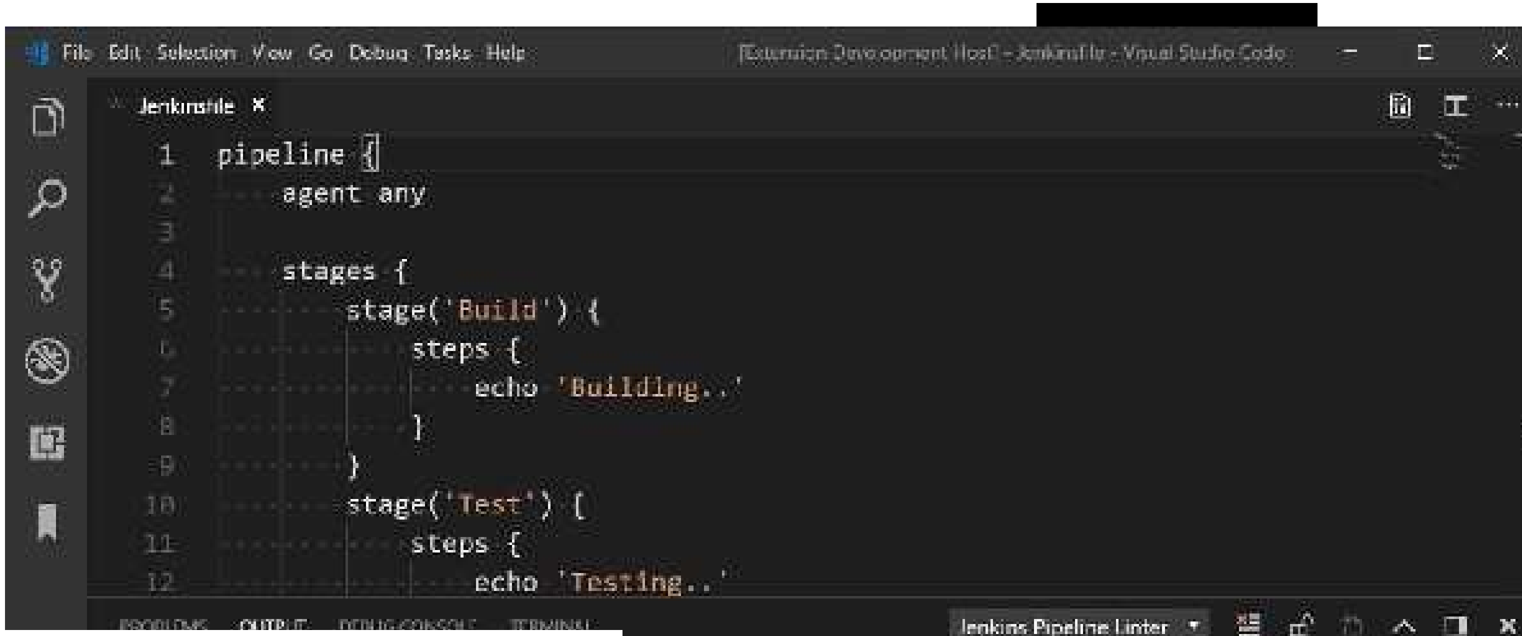

Continuous Integration
Build
auto
Unit Tests
auto
Deploy to stage
auto
Acceptance Tests
Continuous Delivery
Build
auto
Unit Tests
auto
Deploy to stage
auto
Acceptance Tests
manual
Deploy to production
Continuous Deployment
Build
auto
Unit Tests
auto
Deploy to stage
auto
Acceptance Tests
auto
Deploy to production

# IaC Concepts

HashiCorp Terraform

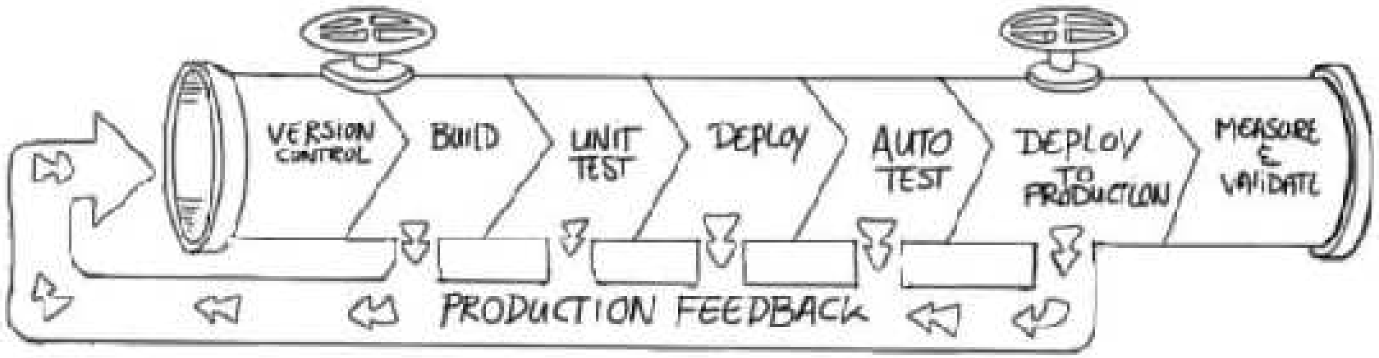


# PaC Concepts

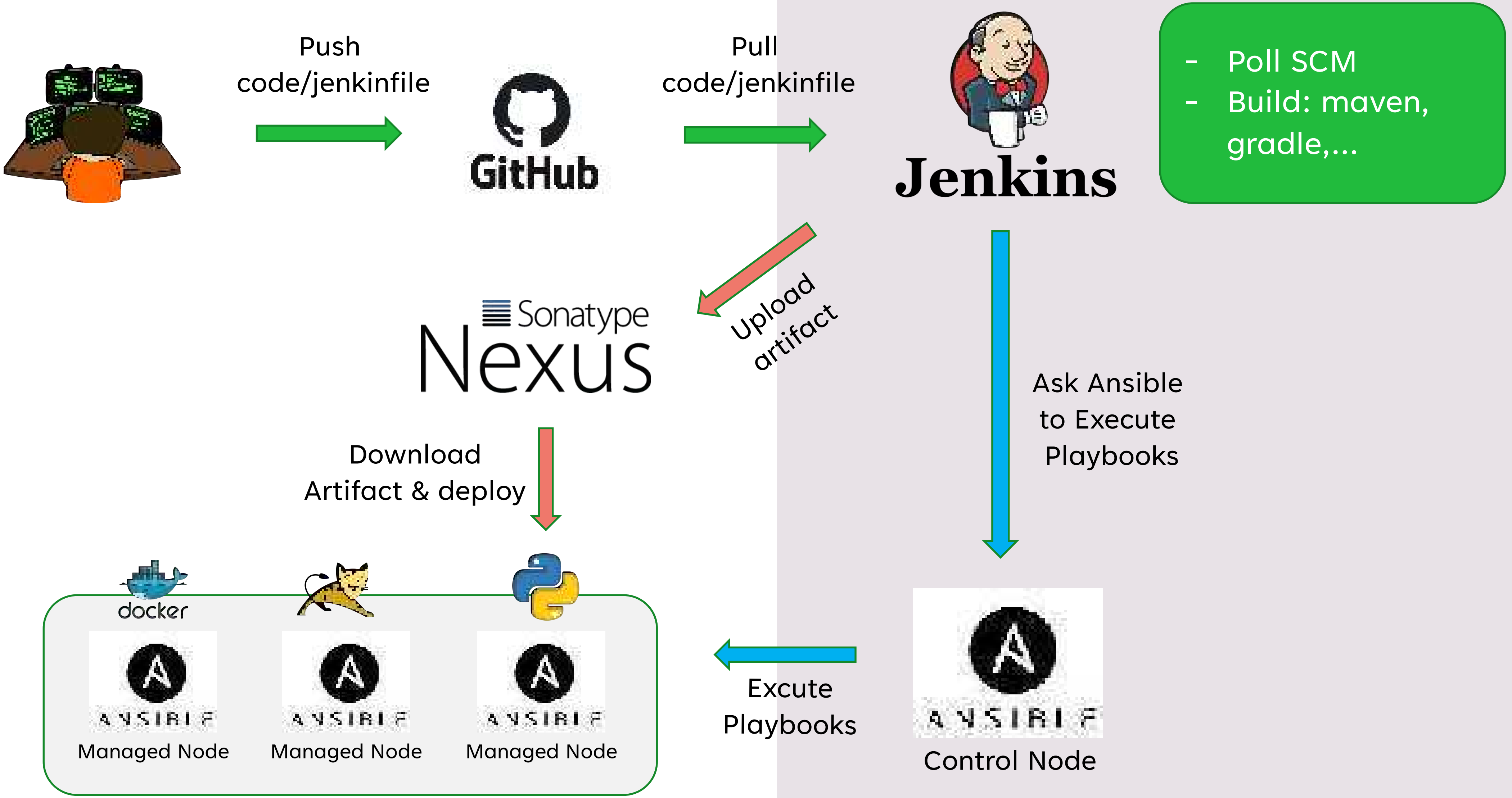

File Edit Selection View Go Debug Tasks Help
[Extension Development Host] - Jenkinsfile - Visual Studio Code
Jenkinsfile
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL
Jenkins Pipeline Linter

```
pipeline {
    agent any

    stages {
        stage('Build') {
            steps {
                echo 'Building..'
            }
        }
        stage('Test') {
            steps {
                echo 'Testing..'
```

Ln 1, Col 11   Spaces: 4   UTF-8   CRLF   Groovy



# Chosen pipeline



# Demo Projects

– Simple Flask Python

– Jenkinfile

# Installation steps

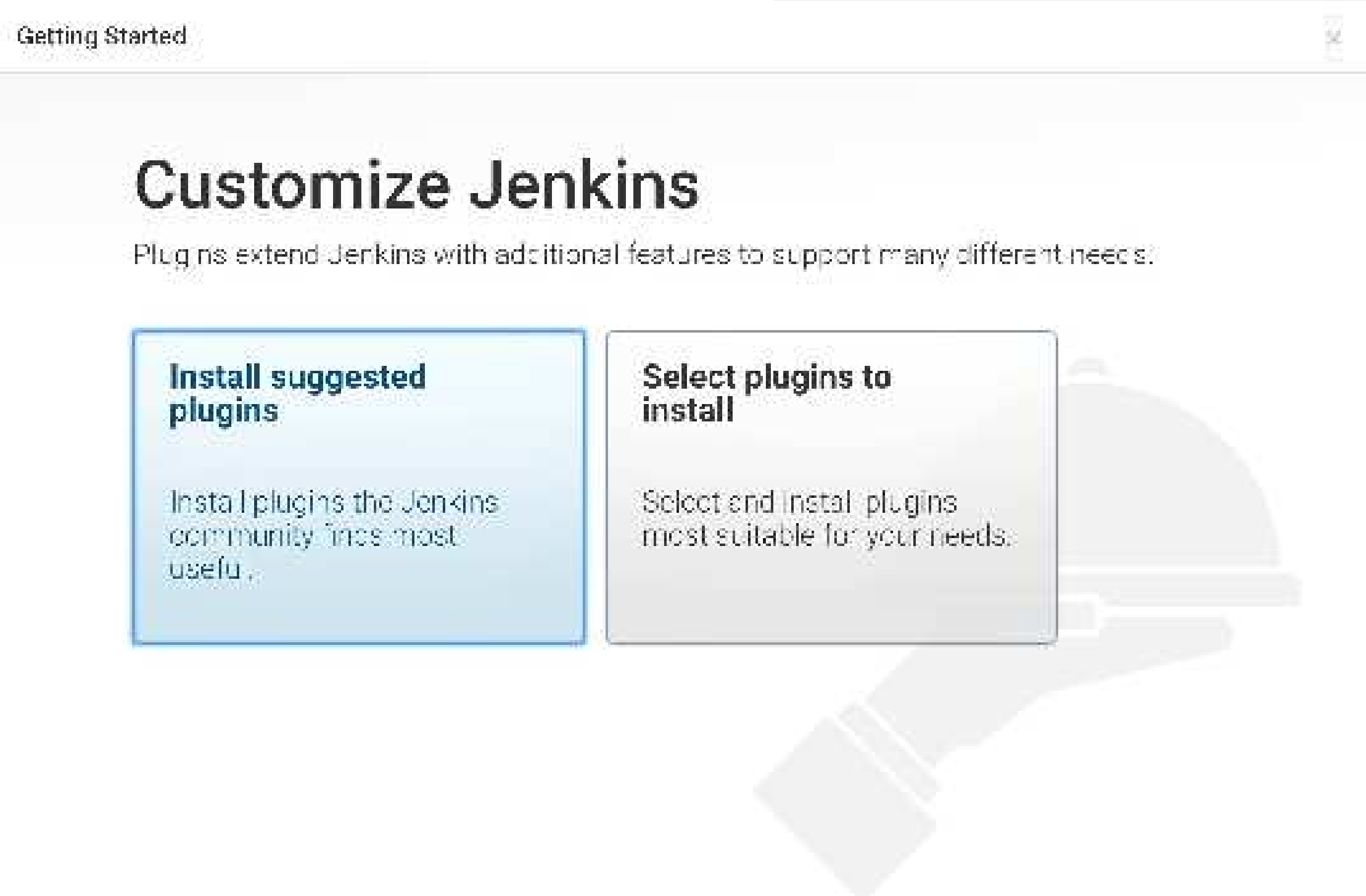
- Setup 4 Ubuntu servers
  - Virtual Box
  - Ubuntu 18.04

# Installation steps

– Install Jenkins

```
wget -q -O - https://pkg.jenkins.io/debian-stable/jenkins.io.key | sudo apt-key add –

sudo sh -c 'echo deb http://pkg.jenkins.io/debian-stable binary/ > /etc/apt/sources.list.d/jenkins.list’

sudo apt update

sudo apt install jenkins

sudo systemctl start jenkins
```

# Installation steps



Getting Started

## Customize Jenkins

Plugins extend Jenkins with additional features to support many different needs.

**Install suggested plugins**

Install plugins the Jenkins community finds most useful.

**Select plugins to install**

Select and install plugins most suitable for your needs.

# Installation steps

- Config Jenkins
  - Initial Password: sudo cat /var/lib/jenkins/secrets/initialAdminPassword
  - Install Plugins: Nexus Artifact Uploader, Github Plugin, Git Plugin, Publish Over SSH
  - Config Plugins: Publish Over SSH (Config System)
  - New Item > Pipeline Items
    - Config Pipeline from SCM
    - Poll SCM
  - Change Jenkins build Step
  - Test by Build Now

# Installation steps

– Install Nexus

```
sudo apt-get update

sudo apt install openjdk-8-jre-headless

cd /opt

sudo wget https://download.sonatype.com/nexus/3/latest-unix.tar.gz

tar -zxvf latest-unix.tar.gz

sudo mv /opt/nexus-3.30.1-01 /opt/nexus
```

# Installation steps

- Install Nexus

```
sudo adduser nexus
sudo visudo
```

Add new line: “nexus ALL=(ALL) NOPASSWD: ALL” and save

```
sudo chown -R nexus:nexus /opt/nexus
sudo chown -R nexus:nexus /opt/sonatype-work
sudo nano /opt/nexus/bin/nexus.rc
```

Uncomment the line and put run_as_user="nexus"

# Installation steps

- Install Nexus

Change JVM heap size in `/opt/nexus/bin/nexus.vmoptions`

```
-Xms1024m
-Xmx1024m
-XX:MaxDirectMemorySize=1024m
-XX:LogFile=./sonatype-work/nexus3/log/jvm.log
-XX:-OmitStackTraceInFastThrow
-Djava.net.preferIPv4Stack=true
-Dkaraf.home=.
-Dkaraf.base=.
-Dkaraf.etc=etc/karaf
-Djava.util.logging.config.file=/etc/karaf/java.util.logging.properties
-Dkaraf.data=./sonatype-work/nexus3
-Dkaraf.log=./sonatype-work/nexus3/log
-Djava.io.tmpdir=./sonatype-work/nexus3/tmp
```

# Installation steps

- Install Nexus

Run Nexus as service:

sudo nano /etc/systemd/system/nexus.service and put content:

```
[Unit]
Description=nexus service
After=network.target
[Service]
Type=forking
LimitNOFILE=65536
ExecStart=/opt/nexus/bin/nexus start
ExecStop=/opt/nexus/bin/nexus stop
User=nexus
Restart=on-abort
[Install]
WantedBy=multi-user.target
```

# Installation steps

– Start Nexus

```
sudo systemctl start nexus
sudo systemctl enable nexus
sudo systemctl status nexus
```

# Installation steps

- Config Nexus
  - Access via Web , port: 8081
  - Initial password : cat /opt/nexus/sonatype-work/nexus3/admin.password
  - Add repo: DeployPython (raw)
- Config Jenkins:
  - Change Jenkins Upload Step using Syntax Generator

# Installation steps

- Install Ansible on Controller Node

```
sudo apt-add-repository ppa:ansible/ansible
sudo apt update
sudo apt install ansible
sudo nano /etc/ansible/hosts
```

Change file content:

```
[servers]
docker ansible_host=192.168.1.141

[all:vars]
ansible_python_interpreter=/usr/bin/python3
```

# Installation steps

– Config Ansible – add ansibleadmin

```
sudo useradd ansibleadmin
```

sudo visudo and put line

```
“ansibleadmin     ALL=(ALL)      NOPASSWD: ALL”
```

sudo nano/etc/ssh/sshd_config change to PasswordAuthentication yes

(also add user ansibleadmin on Managed node)

- Generate keys:

```
ssh-keygen
ssh-copy-id  <ip managed node>
```

Test by ssh without password.

# Installation steps

- Install docker on Managed Node

```
sudo apt update
sudo apt install apt-transport-https ca-certificates curl software-properties-common
curl -fsSL https://download.docker.com/linux/ubuntu/gpg | sudo apt-key add -
sudo add-apt-repository "deb [arch=amd64] https://download.docker.com/linux/ubuntu bionic stable"
sudo apt update
apt-cache policy docker-ce
sudo apt install docker-ce
sudo systemctl status docker
```

Add ansibleadmin to docker group: `sudo usermod –aG docker ansibleadmin`

```
sudo apt-get install python-docker
```

# Installation steps

– Change Jenkinfile to add Deploy

- Write: DeployDocker.yaml on Ansible Controller Node
- Change Jenkin to sshUpload to control Ansible Controller Node to deploy on Managed Node

- Test by Build Now

# Q&A