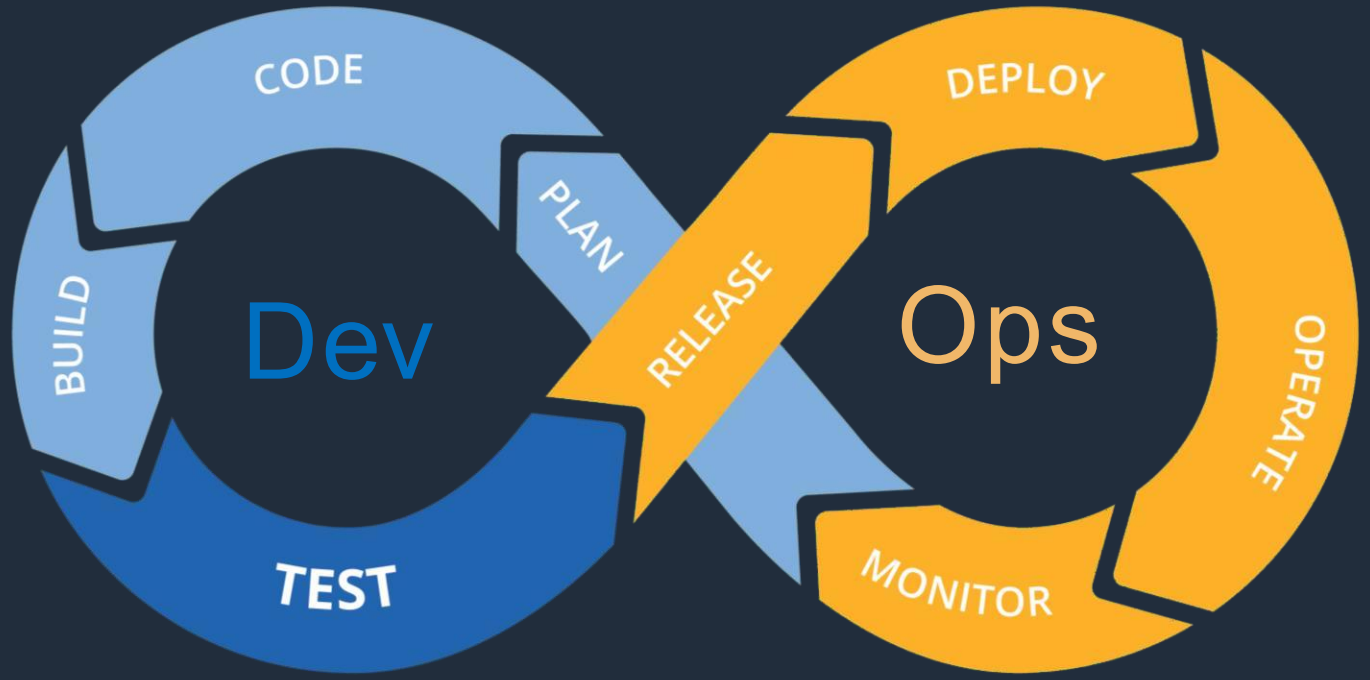
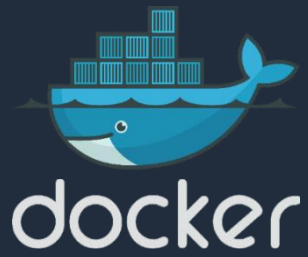
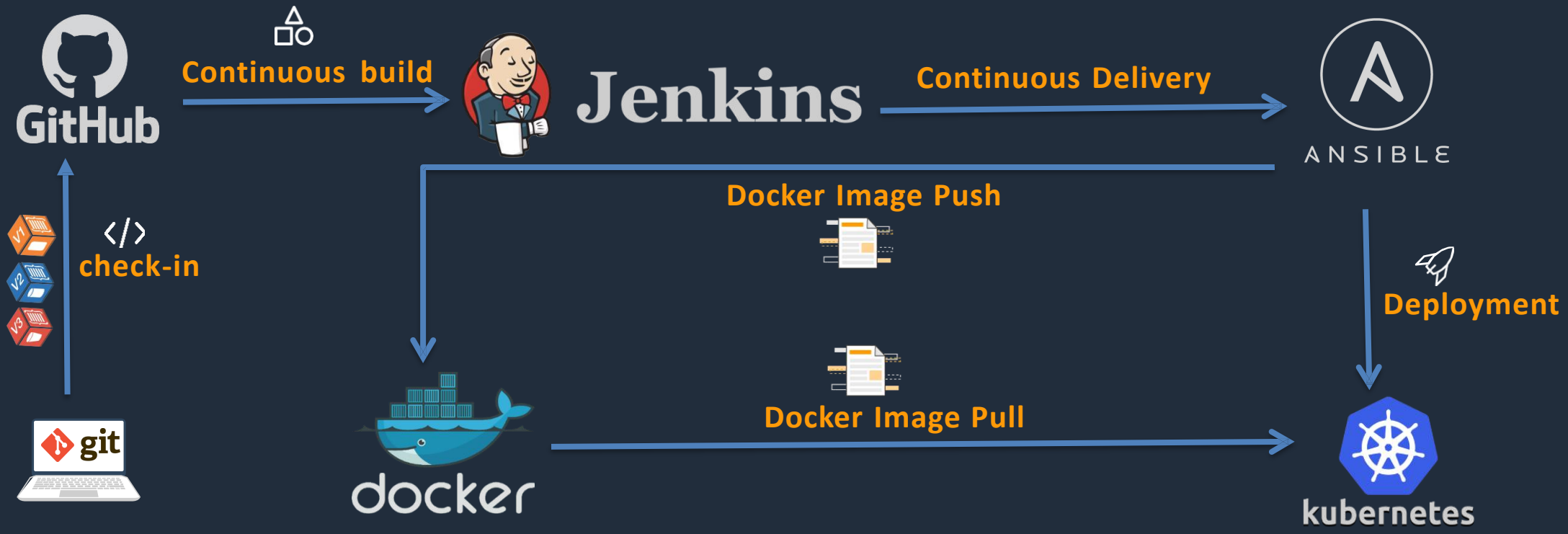


DevOps Project

DevOps Project



DevOps Project



DevOps Project

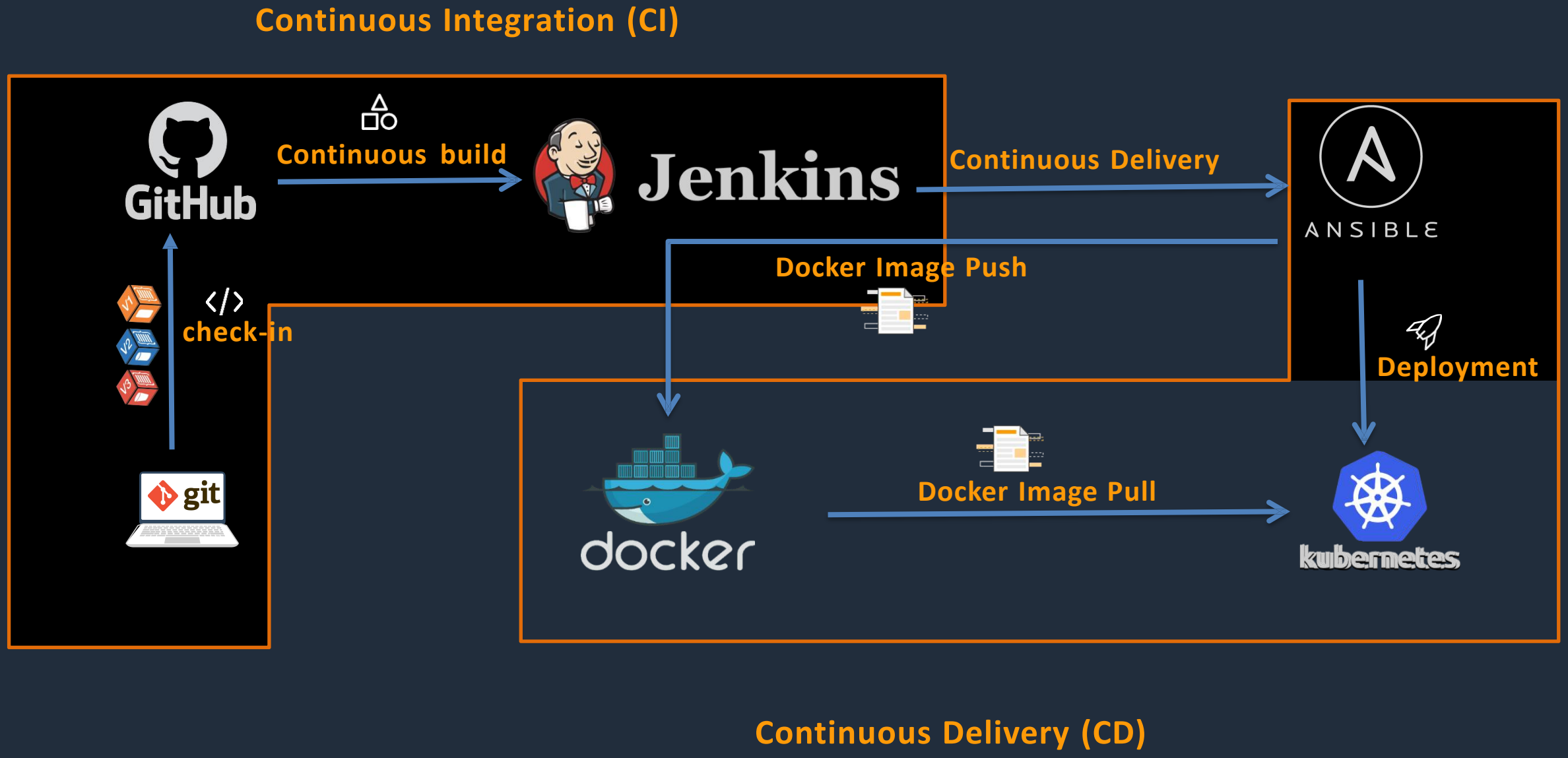
- Continuous Integration (CI)
- Continuous Delivery (CD)
- Continuous Deployment (CD)

DevOps Project

Continuous Integration (CI)

Continuous Delivery (CD)

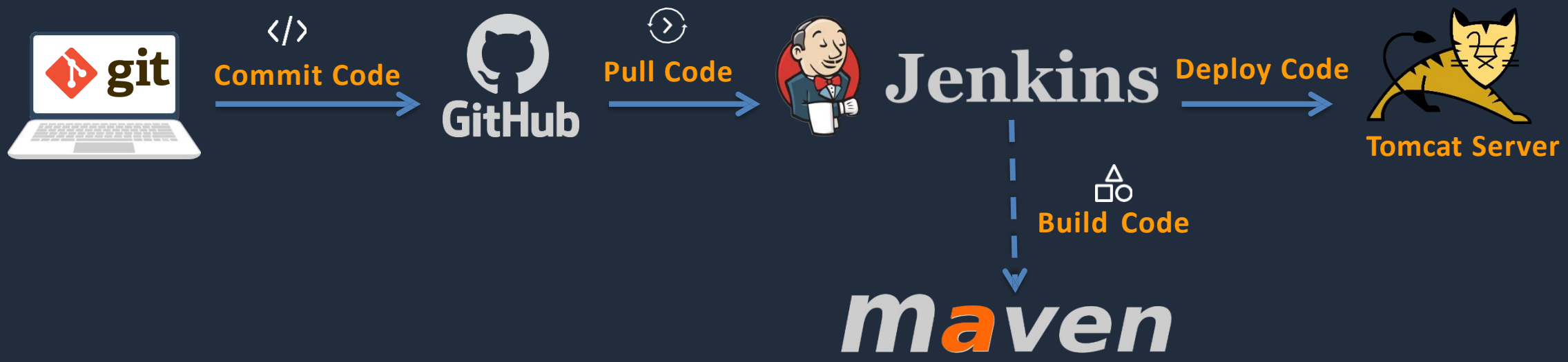
DevOps Project



Build and Deploy on Tomcat Server

- Setup CI/CD with GitHub, Jenkins, Maven and Tomcat
  - Setup Jenkins
  - Setup & configure Maven and Git
  - Setup Tomcat Server
  - Integrating GitHub, Maven, Tomcat Server with Jenkins
  - Create a CI and CD job
  - Test the deployment

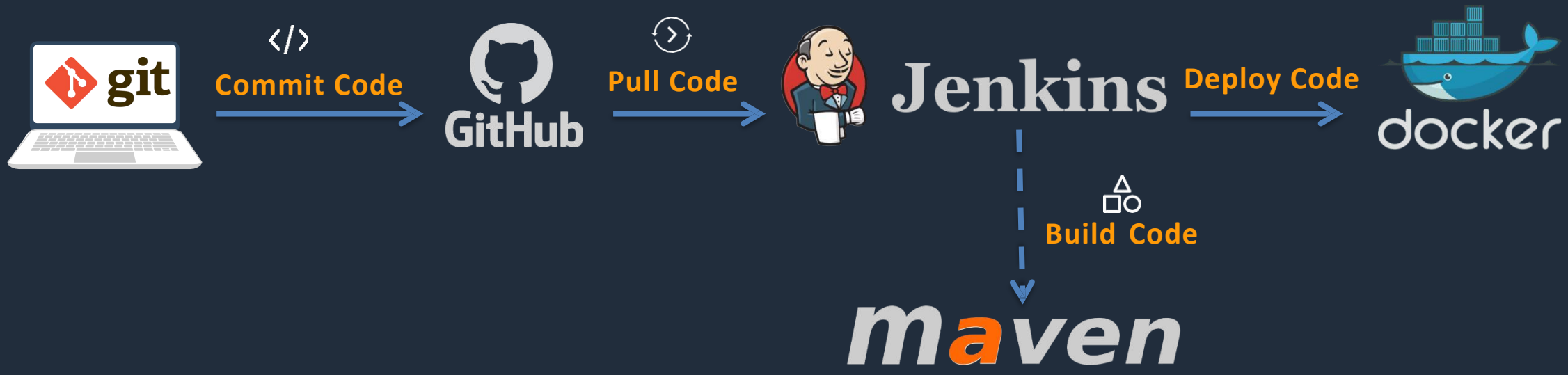
Deploy Artifacts on a Tomcat Server



Deploy Artifacts on a Container

- Setup CI/CD with GitHub, Jenkins, Maven and Docker
  - Setting up Docker environment
  - Write Dockerfile
  - Create an image and container on docker host
  - Integrate docker host with Jenkins
  - Create CI/CD job on Jenkins to build and deploy on a container

Deploy Artifacts on a Container



Deploy Artifacts on a Container

- CI/CD with GitHub, Jenkins, Maven, Ansible and Docker
  - Setup Ansible server
  - Integrate Docker host with Ansible
  - Ansible playbook to create image
  - Ansible playbook to create continuer
  - Integrate Ansible with Jenkins
  - CI/CD job to build code on ansible and deploy it on docker container

Deploy Artifacts on a Container

Deploy Artifacts on Kubernetes

- CI/CD with GitHub, Jenkins, Maven, Ansible and Kubernets
  - Setup Kubernetes (EKS)
  - Write pod, service and deployment manifest files
  - Integrate Kubernetes with Ansible
  - Ansible playbooks to create deployment and service
  - CI/CD job to build code on ansible and deploy it on Kubernetes

Deploy Artifacts on Kubernetes

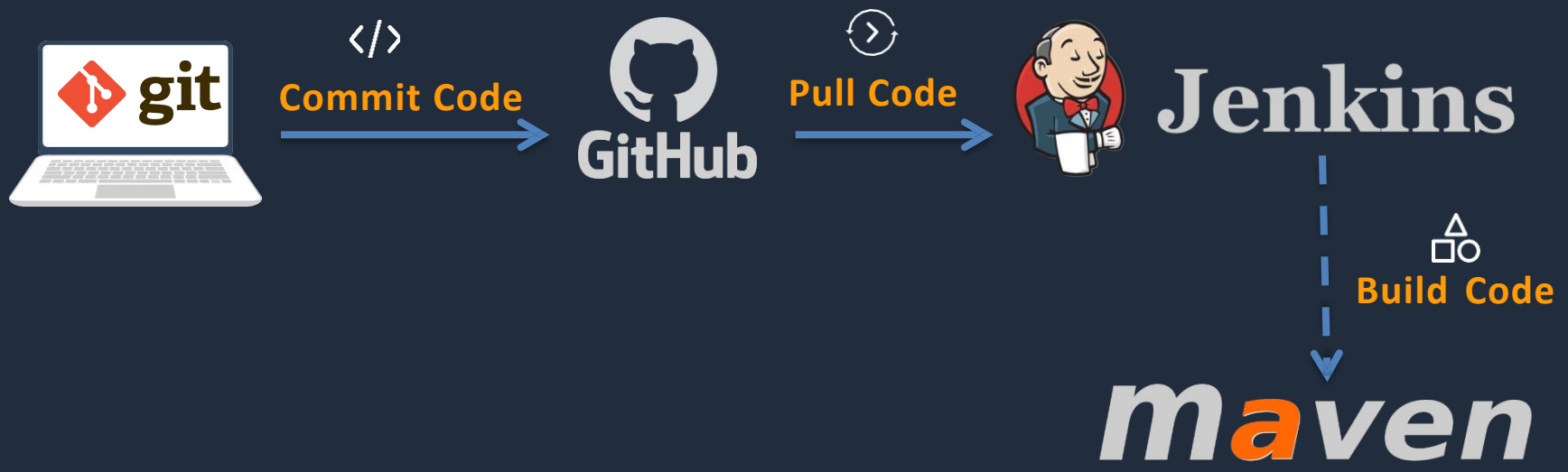
Resources Before Start

- An AWS account
- An GitHub account
- MobaXterm / Putty
- Git Bash setup
- Documentation: https://github.com/yankils/Simple-DevOps-Project
- Source Code: https://github.com/yankils/hello-world

Quick tips to learn fast

- Watch video with 1.5x speed
- Watch complete video or topic
- Understand logical flow
- Search in Q&A for your query
- Create a pull request if you find any improvements
- Connect with me over the LinkedIn or slack channel
- Request you to leave rating and review

Build Code

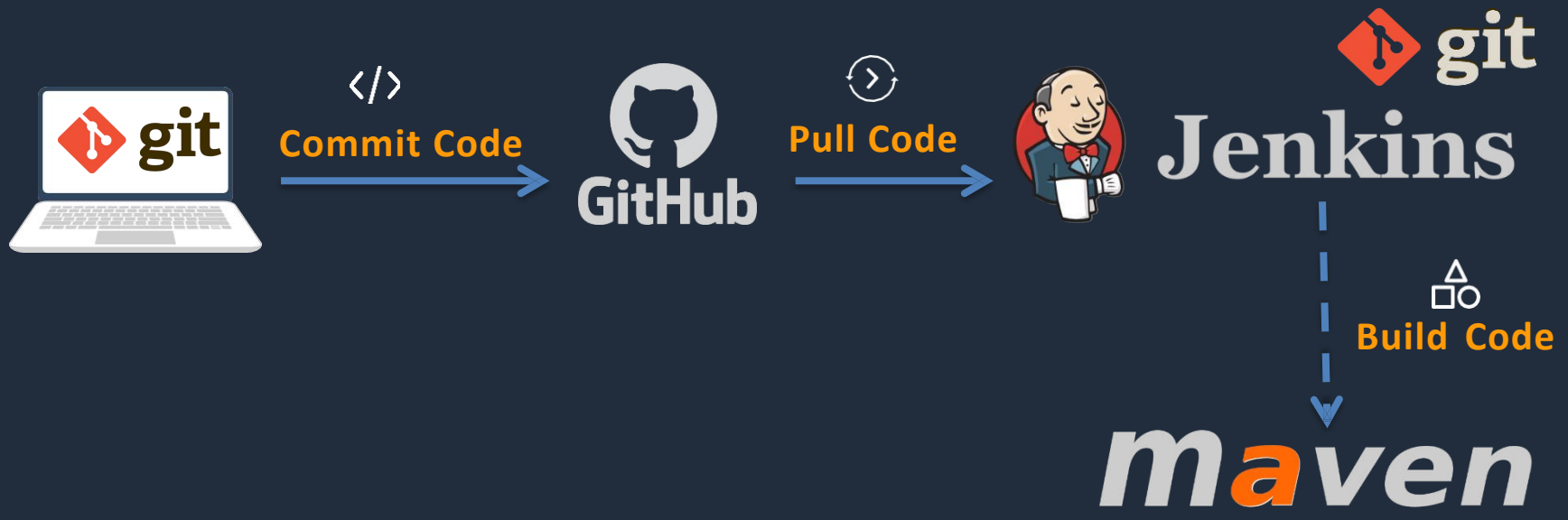


Setup Jenkins Server

- Setup a Linux EC2 Instance
- Install Java
- Install Jenkins
- Start Jenkins
- Access Web UI on port 8080

Jenkins

Build Code


git
Commit Code
GitHub
Pull Code
git
Jenkins
Build Code
maven

Integrate Maven with Jenkins

- Setup Maven on Jenkins Server
- Setup Environment Variables
  - JAVA_HOME, M2, M2_HOME
- Install Maven Plugin
- Configure Maven and Java

Jenkins

Build Code

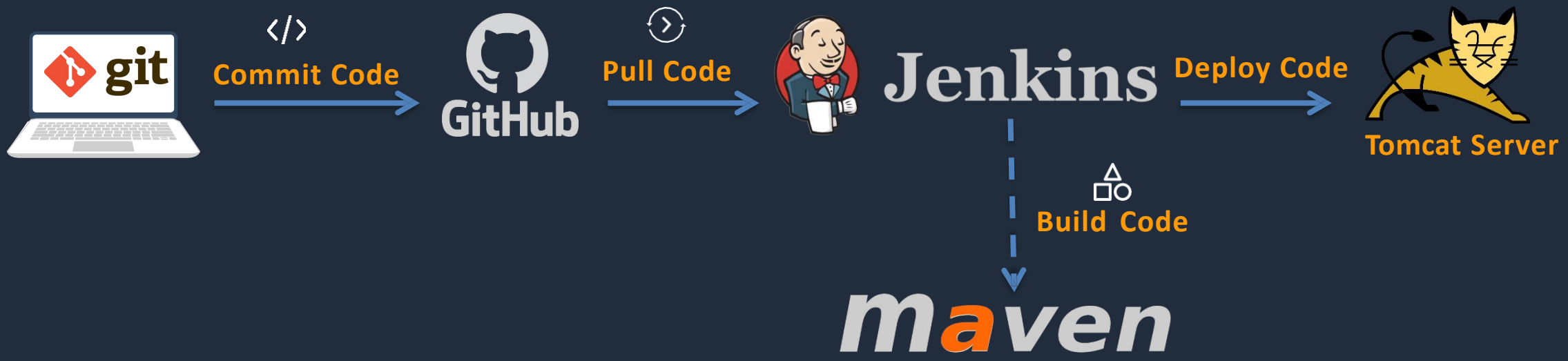
Maven

Integrate GitHub with Jenkins

- Install Git on Jenkins Instance
- Install GitHub Plugin on Jenkins GUI
- Configure Git on Jenkins GUI

Jenkins

Deploy Artifacts on a Tomcat Server



Setup Tomcat Server

- Setup a Linux EC2 Instance
- Install Java
- Download and configure Tomcat
- Start Tomcat Server
- Access Web UI on port 8080

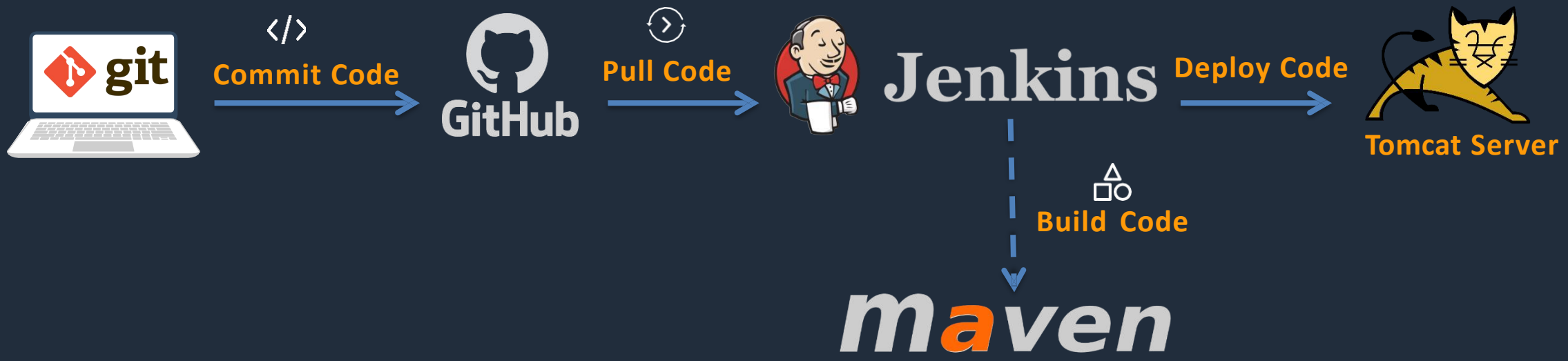
Tomcat Server

Integrate Tomcat with Jenkins

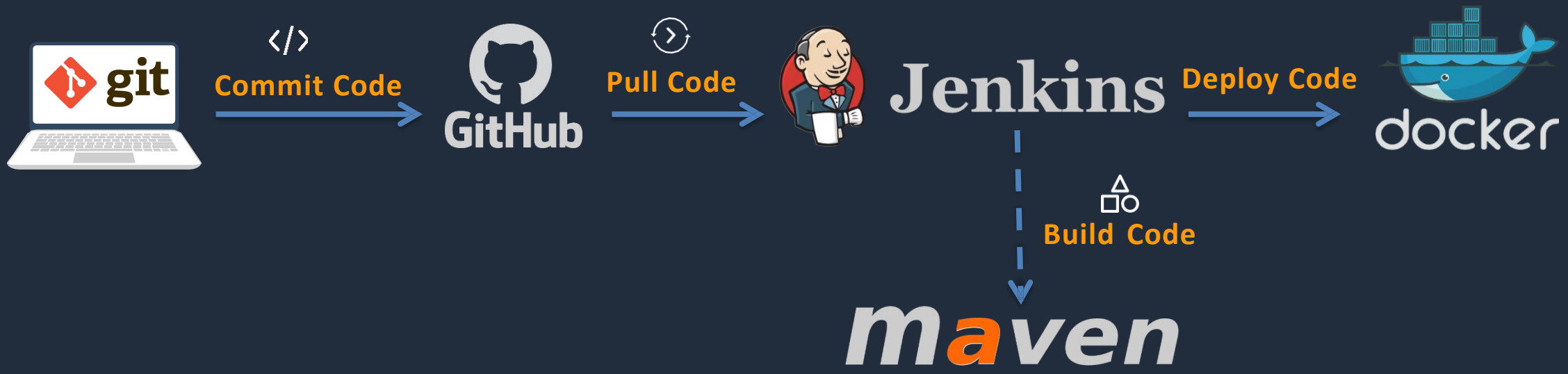
- Install “Deploy to container”
- Configure tomcat server with Credentials

Jenkins

Deploy Artifacts on a Tomcat Server



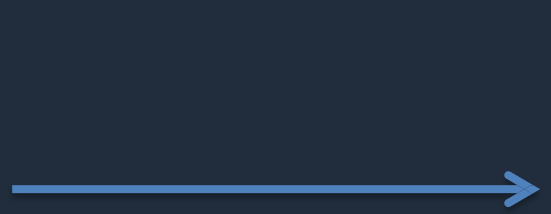
Deploy on a Container



Integrate Docker with Jenkins

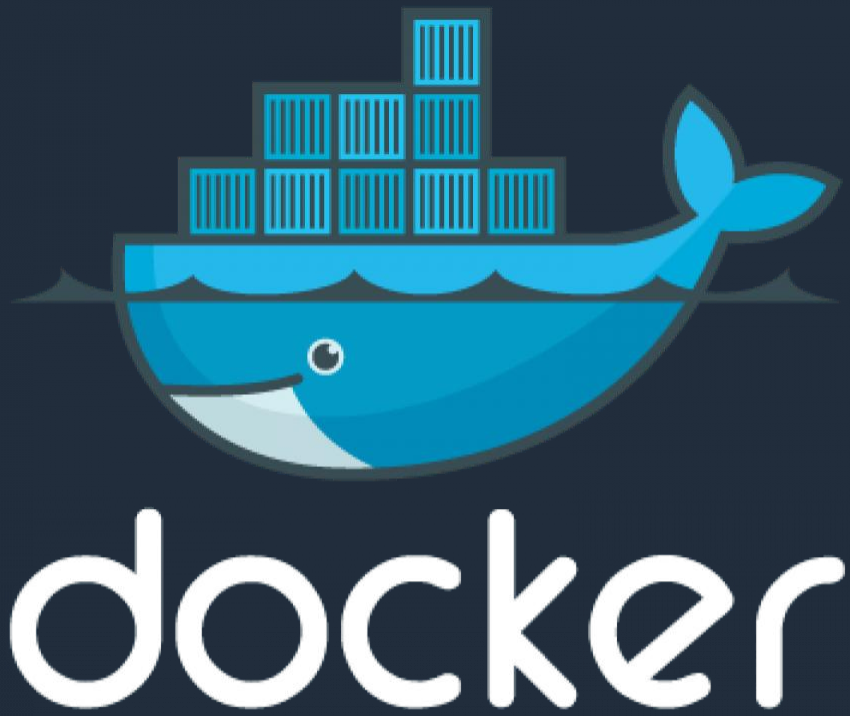
- Create a dockeradmin user
- Install “Publish Over SSH” plugin
- Add Dockerhost to Jenkins “configure systems”

Jenkins

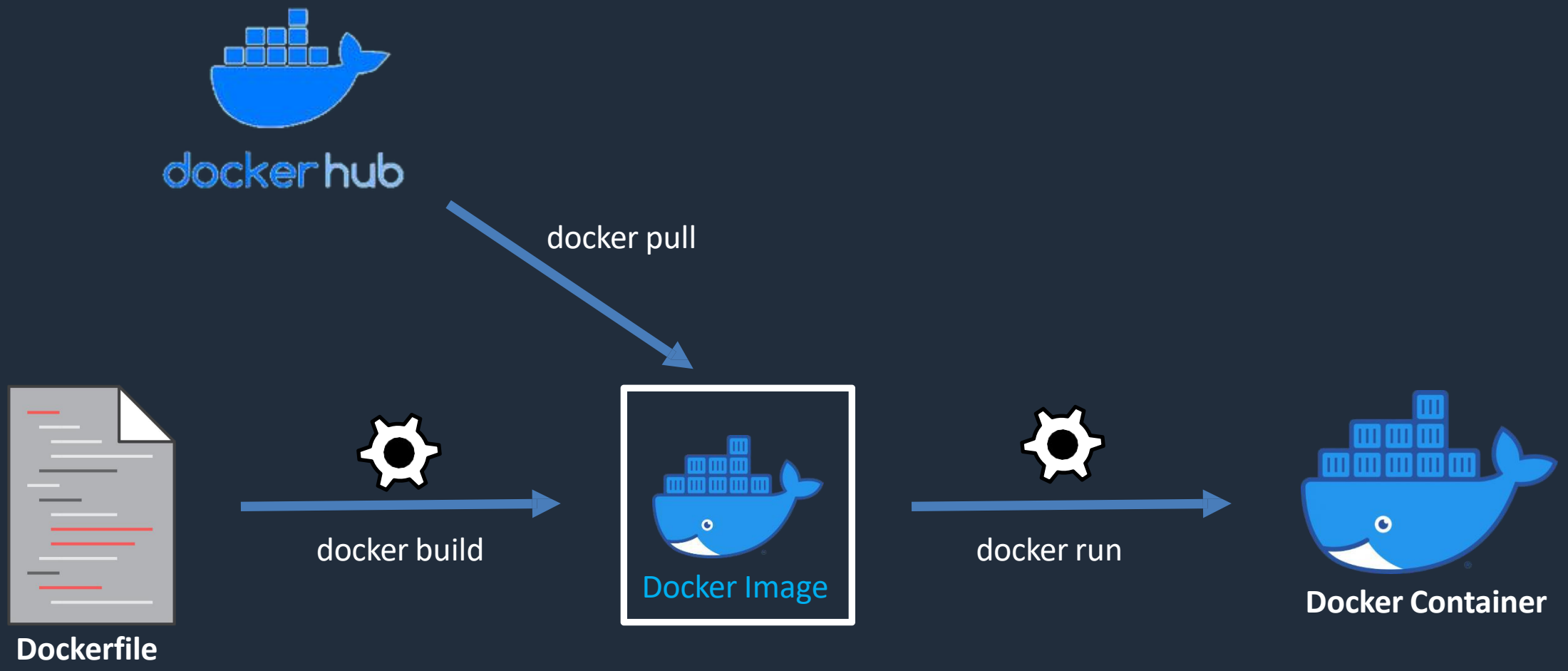


Setup Docker Host

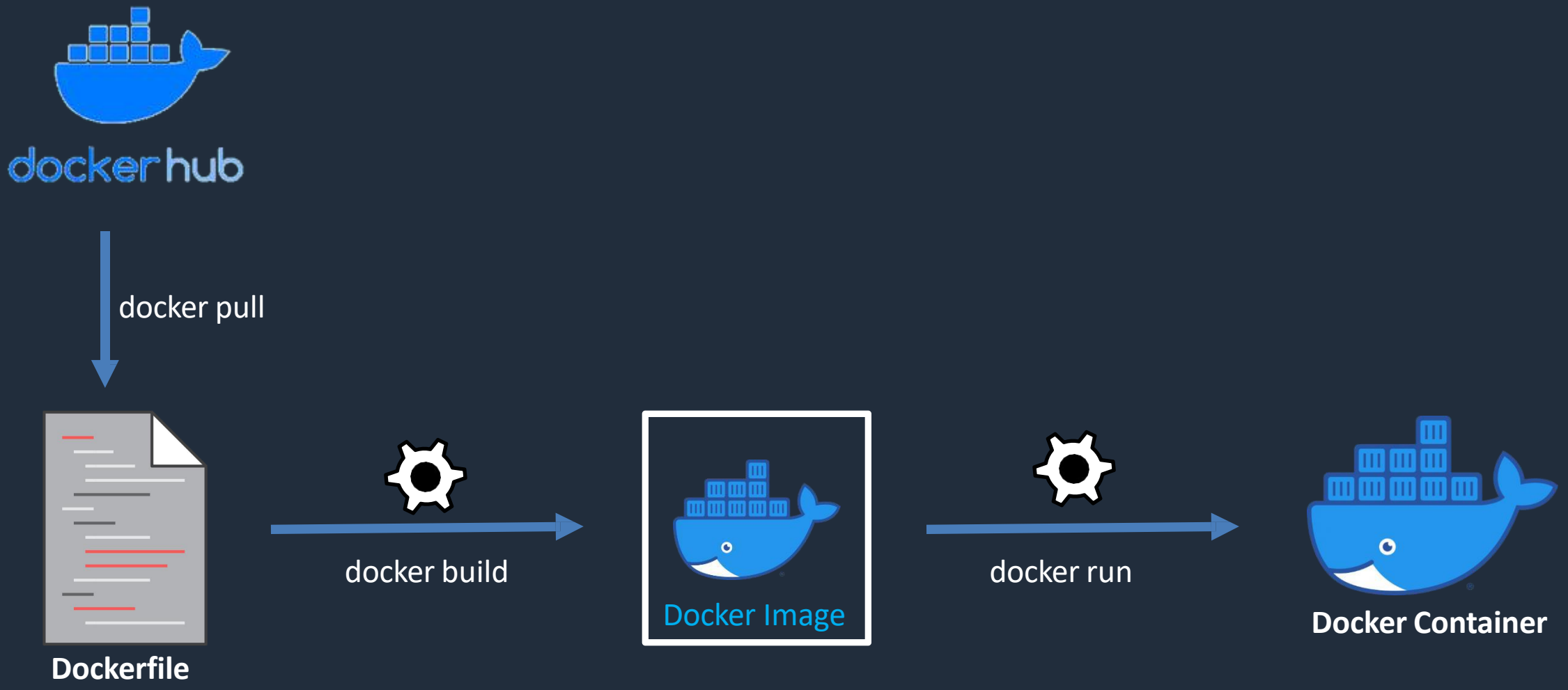
- Setup a Linux EC2 Instance
- Install docker
- Start docker services
- Basic docker commands



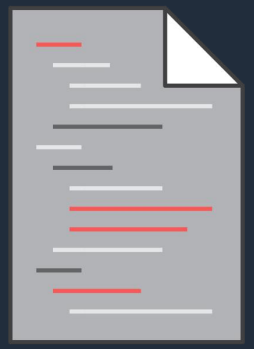
How to create Dockerfile



How to create docker container

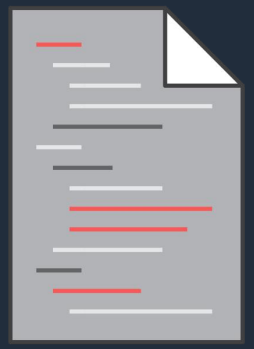


Write Your 1st Docker File



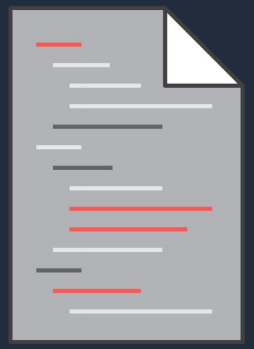
- **FROM:** To pull the base image
- **RUN:** To execute commands
- **CMD:** To provide defaults for an executing container
- **ENTRYPOINT:** To configure a container that will run as an executable
- **WORKDIR:** To sets the working directory
- **COPY:** To copy a directory from your local machine to the docker container
- **ADD:** To copy files and folders from your local machine to docker containers
- **EXPOSE:** Informs Docker that the container listens on the specified network ports at runtime
- **ENV:** To set environment variables

Install tomcat on Centos



- Pull centos from dockerhub - **FROM**
- Install java - **RUN**
- Create /opt/tomcat directory - **RUN**
- Change work directory to /opt/tomcat - **WORKDIR**
- Download tomcat packages - **ADD /RUN**
- Extract tar.gz file - **RUN**
- Rename to tomcat directory - **RUN**
- Tell to docker that it runs on port 8080 - **EXPOSE**
- Start tomcat services - **CMD**

DockerFile

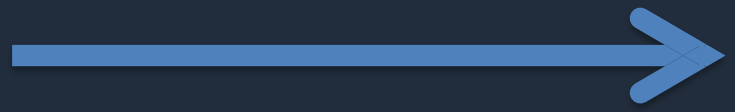


- FROM centos
- RUN yum -y install java
- RUN mkdir /opt/tomcat/
- WORKDIR /opt/tomcat
- ADD https://dlcdn.apache.org/tomcat/tomcat-9/v9.0.54/bin/apache-tomcat-9.0.54.tar.gz /opt/tomcat
- RUN tar xvfz apache*.tar.gz
- RUN mv apache-tomcat-9.0.54/* /opt/tomcat
- EXPOSE 8080
- CMD ["/opt/tomcat/bin/catalina.sh", "run"]

Deploying as a Container

Manage DockerHost with Ansible

- **On Docker Host**
  - Create ansadmin
  - Add ansadmin to sudoers files
  - Enable password based login
- **On Ansible Node**
  - Add to hosts file
  - Copy ssh keys
  - Test the connection



Integrate Ansible with Jenkins

Jenkins

ANSIBLE

Deploy Ansible playbook

- Remove existing container
- Remove existing image
- Create new container

Prepare Ansible Server

- Setup EC2 instance
- Setup hostname
- Create ansadmin user
- Add user to sudoers file
- Generate ssh keys
- Enable password based login
- Install ansible

Deploying on Kubernetes

Setup Kubernetes

Deployment Tools:

- Bootstrapping clusters with kubeadm
- Installing Kubernetes with kops
- Installing Kubernetes with Kubespray

Managed Services:

Amazon EKS

Microsoft AKS

Kuberentes Setup Methods

- kubeadm
- kops
- Kubespray

Deployment Tools

- Amazon EKS
- Microsoft AKS

Managed Services

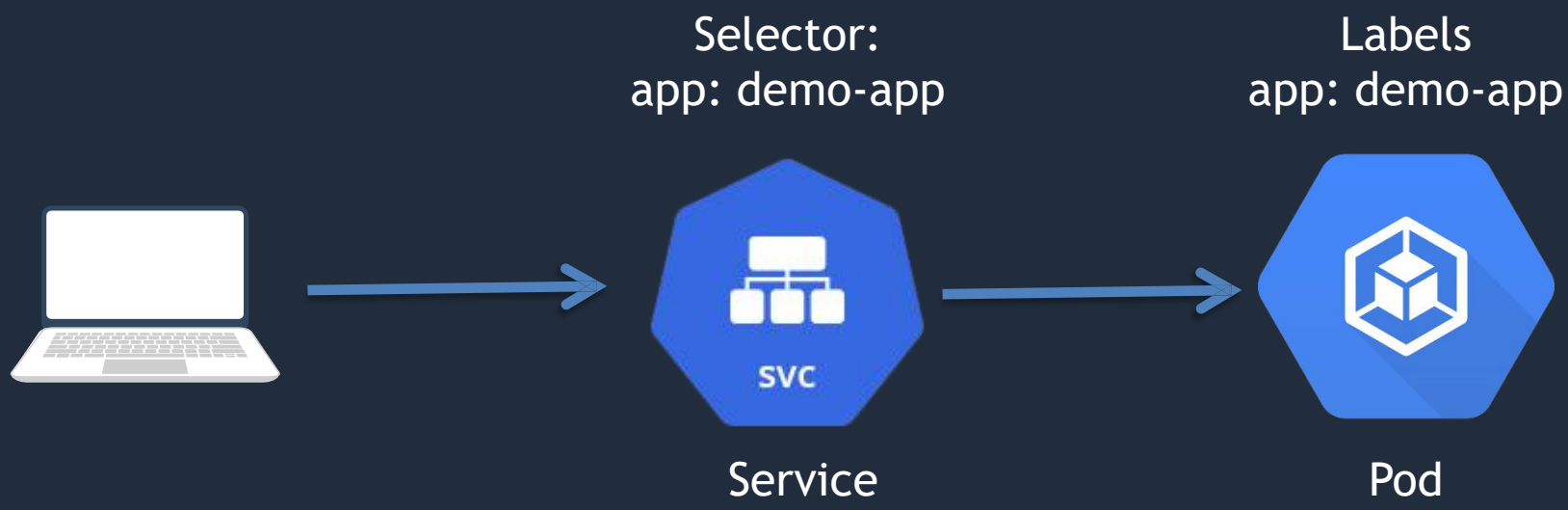
EKS Setup

- Launch EC2 instance - Bootstrap
- Latest version of AWSCLI
- Setup kubectl
- Setup eksctl
- Create IAM role
- Create a cluster
- Validate cluster
- Delete cluster

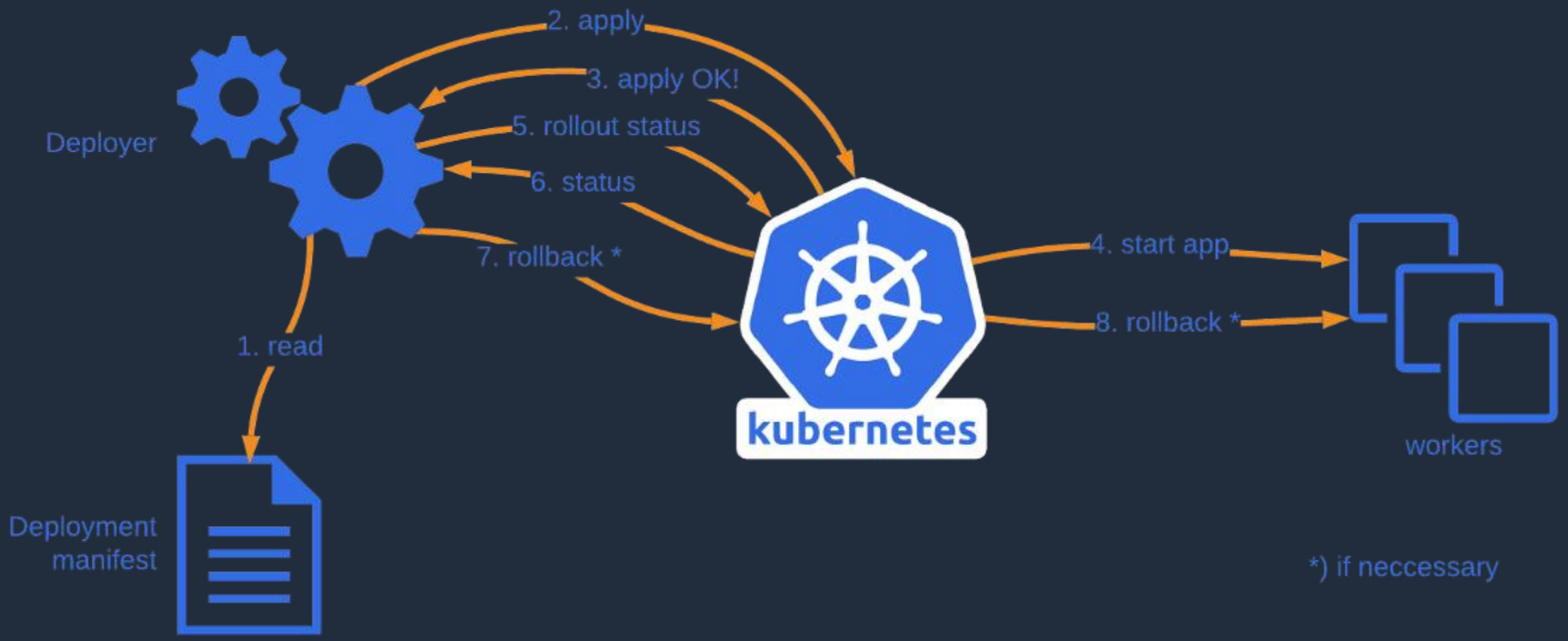
What do we cover in section

- Setup Kubernetes in EKS (using eksctl)
- Deploy demo app through kubectl command
- Who to write your 1st manifest file
- Manifest files for our register app
- Integrate Kubernetes with Ansible
- Create ansible playbook for deployments
- Create Jenkins

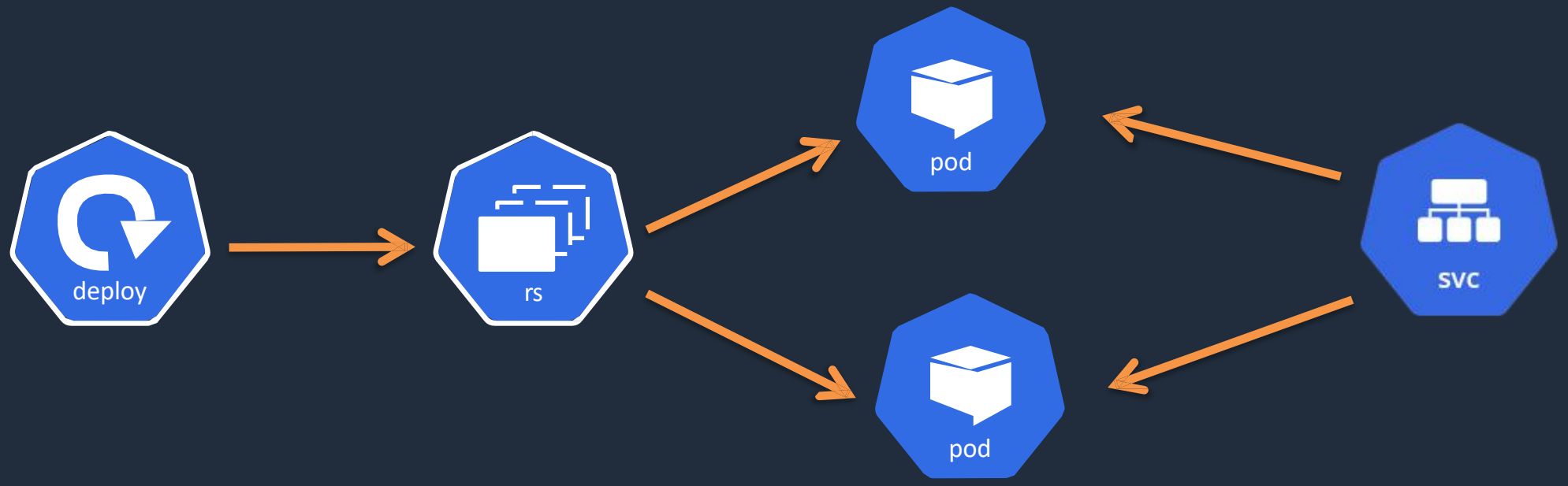
Setup Pod and Service



Setup Pod and Service



Create a Pod



```yaml
apiVersion: apps/v1
kind: Deployment
metadata:
  name: valaxy-regapp
  labels:
    app: regapp
spec:
  replicas: 2
  selector:
    matchLabels:
      app: regapp
  template:
    metadata:
      labels:
        app: regapp
    spec:
      containers:
      - name: regapp
        image: valaxy/regapp
        imagePullPolicy: Always
        ports:
        - containerPort: 8080
  strategy:
    type: RollingUpdate
    rollingUpdate:
      maxSurge: 1
      maxUnavailable: 1
```

Deployment name and Deployment label

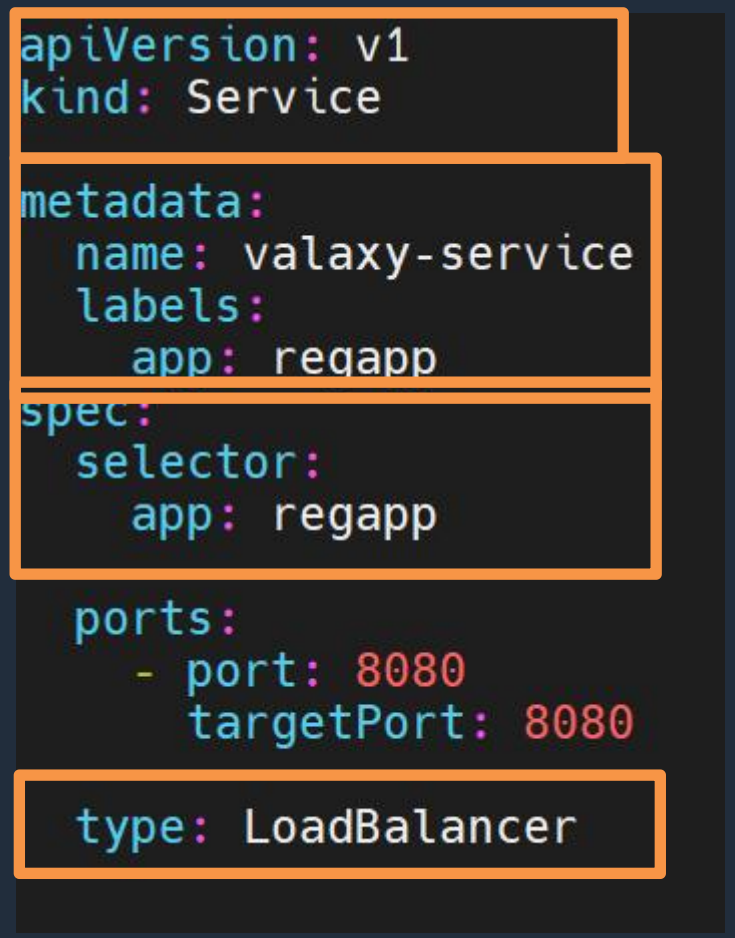
Create 2 pods from the pod template

Pod definition

template to create a pod

image name

Service file

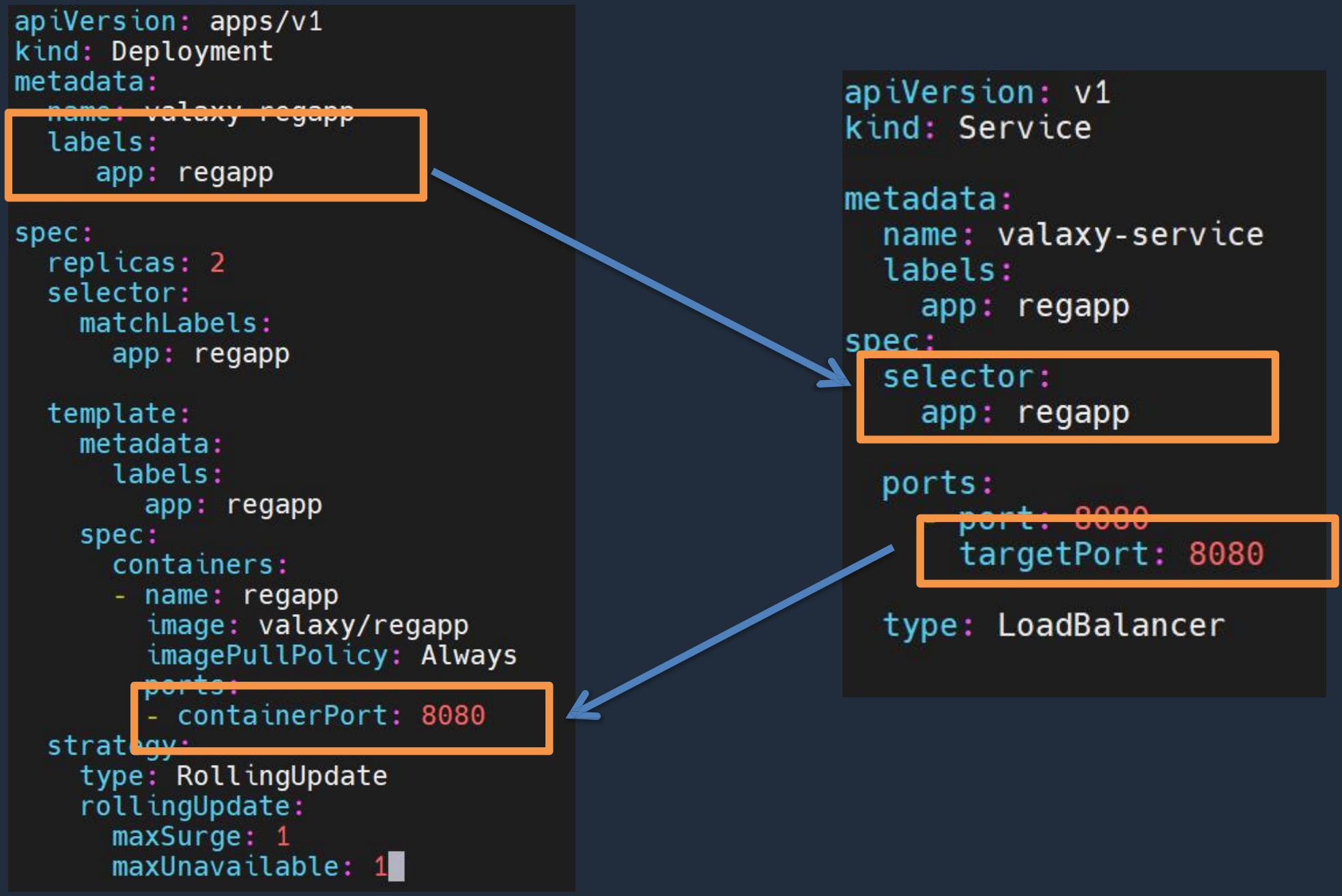


Resource Type

Service name and label

To which deployment it can send traffic

What is the service type


apiVersion: apps/v1
kind: Deployment
metadata:
labels:
app: regapp
spec:
replicas: 2
selector:
matchLabels:
app: regapp
template:
metadata:
labels:
app: regapp
spec:
containers:
- name: regapp
image: valaxy/regapp
imagePullPolicy: Always
- containerPort: 8080
type: RollingUpdate
rollingUpdate:
maxSurge: 1
maxUnavailable: 1
apiVersion: v1
kind: Service
metadata:
name: valaxy-service
labels:
app: regapp
spec:
selector:
app: regapp
ports:
targetPort: 8080
type: LoadBalancer

Integrate Kubernetes with Ansible

- **On Bootstrap server**
  - Create ansadmin
  - Add ansadmin to sudoers files
  - Enable password based login
- **On Ansible Node**
  - Add to hosts file
  - Copy ssh keys
  - Test the connection

Deploying as a Pod