

Dev-Ops E. Degree Syllabus = HLD

Note:

- 1) We are offering Hands on Training from basic (no prior knowledge) to advanced and expert working knowledge in all the topics mentioned below.
- 2) Soft copy materials and Interview Questions will be provided.
- 3) Realtime Use Case Scenarios
- 4) Resume Preparation and Job Assistance.

1) DevOps Introduction

- ❖ Software Development Life Cycles (SDLC)
 - Waterfall Model
- ❖ Agile Methodology
 - Scrum Model
- ❖ What is DevOps?
- ❖ Why DevOps? Automation
- ❖ DevOps Importance
- ❖ DevOps Model
- ❖ DevOps Life cycle
- ❖ Market Trend and Career Scope for DevOps
- ❖ DevOps Tools

2) Linux – 3

- ❖ Installing Pre-requisite software's (SSH Tools and FTP Tools) in Desktop/Laptop.
- ❖ Create an account in AWS.
- ❖ Create EC2 Instance in AWS.
- ❖ Understand Linux Command Line.
 - Linux File/Directory structure.
 - Linux Commands

mkdir	cat	service	userdel	Uname
Is	head	uptime	groupdel	cat /etc/*releases
tree	Tail	last	crontab	watch
cd	more	ps	ssh	netstat
pwd	less	kill	scp	exit/logout/ctrl+d
rmdir	sort	top	rsync	Uname
touch	tr	sar	ssh-keygen	cat /etc/*releases

find	sed	zip	ssh-cpy-id	watch
umask	grep	unzip	awk	netstat
chmod	who	tar	cut	exit/logout/ctrl+d
chown	w	useradd	free	Uname
chgrp	whoami	passwd	dmidecode	Uname
cp	whereis	chage	mail	cat /etc/*releases
mv	date	groupadd	clear	watch
rm	df	usermod	cal	netstat
file	du	id	wget	exit/logout/ctrl+d
WC	hostname	lid	tee	Uname
In	ipconfig	SU	script	cat /etc/*releases
vim	man	sudo	ping	watch
nano	help	users	telnet	netstat
echo	info	groups	history	exit/logout/ctrl+d

2. Shell Scripting - 1 – 2 weeks - 40 commands 7%

- Introduction
- What is Shell?
- Types of Shells
- What is Shell Scripting?
- First Shell Script program
- File Naming Conventions
- Comments
- Variables
- Command line Arguments
- Escape Characters
- String
- Arithmetic Operations
- User Interaction using read command
- Input and Output Redirection
- Control commands - if
- Control commands - for
- Control commands - while loop
- Control commands - Switch case
- Functions
- Pipe

3) Git and GitHub - Versioning - Developers – 10 hours

- What is Git?
- What is the VCS?
- What is SCM?
- What is Branch?
- What is Tag?
- Git Administration.
- Git commands
- Working with git as a Developer perspective
- SSH Key generation
- PAT creation
- Cloning Repositories
- Merging Branches
- Branching strategy
- Best practices for Releases/Code commits in any VCS

4) Maven – 4 hours

- Introduction
- Features & Benefits of Maven
- Installation (Maven Environment Setup)
- Directory Structure
- Content of pom.xml
- Maven Repositories
- Maven Life Cycles
- Executing some Examples
- Maven Multi Modules
 - Parent pom
 - Child pom
 - Maven Profiles

5) Tomcat / JBoss /

- Introduction
- Difference between App server and Web server
- Understanding of Web Servers, App Servers and DataBase Servers
- Installation (In Windows - Extraction, In Linux Installation)

- Directory structure
- Start the Tomcat server
- Users creation
- Stop the server
- Roles
- Port number change
- Application Deployment
 - Through Admin Console
 - Copy artifact into webapps folder
- Tomcat Tuning
- Data source Creation

6) Apache HTTP Server

- Introduction
- Installation
- Directory Structure
- Start the HTTP server
- Deploy the web static application.

7) SonarQube

- Introduction
- Pre-Requisites
- Architecture
- Installation
- Change the Port Number
- Execution
- Administration
 - Users Creation (Normal User and Administrator)
 - Project Creation
 - Project deletion
 - Token Generation
 - Create Quality Profiles
 - Create Quality Gates
 - Configure Email settings

8) Nexus

- Introduction
- Installation
 - Password and Email change for Admin User
 - Email server Configuration
 - Port Number Change
 - Context root change
- Nexus Directory structure
- Create the Repositories
- Integrate the Maven with Nexus
- Create Users

9) Jenkins

- **Introduction**
 - Continuous Integration (CI)
 - Continuous Delivery (CD)
 - Continuous Deployment (CD)
- **Installation**
 - In Linux Server
- **Create the Maven Project using Freestyle Project type**
 - Integrate Maven software if not done.
 - Integrate Nexus with Jenkins
 - Integrate SonarQube with Jenkins
 - Deploy the App into Tomcat
 - Through "Deploy to container" plugin
 - Through Script - SSH Agent Plugin
 - Configure Email Functionality
 - Poll SCM
 - Build Periodically
 - Git Web Hooks
 - Discard Old Build
 - Disable this project
 - Delete workspace before build starts
 - Add timestamps to the Console Output
 - JACOCO plugin
- **Jenkins Directory structure**
- **Create the Maven Project using Maven Project type**

- **Plugin Management**
 - Safe Restart
 - Next Build Number
 - Email Extension
 - SonarQube Scanner
 - Schedule Build
 - Artifactory Plugin
 - Cloud Foundry
 - Blue Ocean
 - Deploy to container
 - Deploy WebLogic
 - Maven Integration
 - JACOC
 - SSH Agent
 - Publish Over SSH

 - Thin Backup
 - Build Name Setter
 - Convert To Pipeline
- **External Plugins Installation**
 - Urban Code Deploy

- **Port Number Change**

- **Build with parameters**

- **Create View**

- **Jenkins Security**
 - Create Users (Default Admin)
 - Provide the specific access Jenkins
 - Provide the access to specific access to specific projects

- **Create the Pipeline Project Jobs**
<http://localhost:8080/env-vars.html/>

- **Create the Multibranch Pipeline Project Jobs**

- **Create Master/Slave**

- **Jenkins Backup**
- **Jenkins Migration**
- **Optional Topics**
 - Jenkins Home Directory Change in RHEL 7.5 Version
 - Jenkins CLI
 - Integrate the Urban Code Deploy server with Jenkins
 - Deploy the App into IBM Cloud
 - Slack integration

10) **Docker – 18 hours**

- Docker Introduction
- Containerization Vs Virtualization
- Docker Vs Virtual Machine
- Docker Installation

- Dockerfile
- Docker Image
- Docker Container
- Docker Adhoc Commands
- Docker Networks
- Docker Volumes
- Docker Keywords
- Dockerfile Creation
- Docker Images creation
 - Docker Images save to Dockerhub
 - Docker Private Repo
 - Docker Compose
 - Docker Swarm

11) **Kubernetes - 27 hours - CKA**

- Kubernetes Introduction
- Architecture
- Kubernetes Cluster (Self-Managed) Setup Using Kubeadm.
- Kubernetes Namespace

- Kubernetes Objects
 - POD
 - Replication Controller
 - Replica Set
 - Daemon Set
 - Deployment
 - Rolling Update
 - Recreate
 - Blue Green
 - Stateful Set
 - Service
 - ❖ ClusterIP
 - ❖ NodePort
 - ❖ Load Balancers
 - Volumes
 - Persistent Volume
 - Persistent Volume Claim
 - Dynamic Volumes
 - Config Maps & Secrets
- HPA & Metrics Server
- Kubernetes Cluster Setup in AWS Using KOPS
- EKS Kubernetes Cluster Setup Using Terraform
- Load balancer Service
 - ❖ Network LB
 - ❖ Application LB
 - ❖ HAProxy
- Ingress Controller & Resource
- Liveness & Readiness probes
- Kubernetes RBAC
- Kubernetes & Jenkins Integration
- Kubernetes Dashboard Setup
- Helm
- Monitor Kubernetes Using Prometheus And Grafana.

12) Ansible

- Introduction
- Architecture

- ssh-key generation
- Copy SSH Key
- Ansible adhoc Commands
- Ansible Playbooks
- Execution of Ansible Playbooks
- Ansible Modules
- Ansible Variables, Group/Host Variables
- Loops & Conditions
- Roles
- Ansible Vault
- Ansible Galaxy
- Dynamic Inventory

13) AWS

- Cloud & AWS – Cloud Infrastructure Engineer
 - ❖ Managed and Self-Managed Infrastructures
 - ❖ IaaS
 - ❖ PaaS
 - ❖ SaaS
- Elastic Compute Cloud (EC2)
 - Introduction to Amazon EC2
 - Launch Our First EC2 Instance - Part 1
 - Launch Our First EC2 Instance - Part 2
 - How to use Putty (Windows Users Only)
 - Security Groups
 - EC2 Instance User Data.
 - Summary of EC2 Section
 - Amazon Machine Instance (AMI)
 - Elastic IP (EIP)
- EBS
 - Volumes
 - Snapshots
- EFS

- Simple Storage Service (S3)
 - S3 Essentials
 - Creating S3 Buckets Using The Console and CLI
 - S3 Storage Options and Types
 - Create an S3 Website
 - S3 Version Control
 - Cross Region Replication
 - S3 Lifecycle Management & Glacier
 - S3 – Security, Snowball & S3 Summary
- Elastic Block Store (ELB)
 - What is ELB and it's uses
 - ELB Policies and it's benefits
 - How to launch ELB with N nodes and other concepts on ELB.
- Auto Scaling
 - Launch Configurations
 - Scaling Polices
 - Demo with Dynamic Scaling
 - Integrate Autoscaling with ELB.
- Virtual Private Cloud (VPC)
 - VPC Overview
 - Building our own custom VPC
 - Build A Custom VPC - Part 2
 - Network Address Translation (NAT)
 - Access Control Lists (ACLs)
 - Custom VPC's
 - VPC Clean Up
 - VPC Summary
- Identity Access Management (IAM)
 - Introduction of IAM
 - Users
 - Groups
 - Roles
 - Policies
 - Permissions
- AWS CLI Setup

15) Monitoring Tools (New Relic)

- Introduction
- Creating Synthetic Monitors
 - Ping
 - Simple Browser
 - Scripted Browser
 - API Test
- Creating Channels
- Creating Alerts
- Integrating with Slack

Addon Tools

16) MySQL

17) Cloud Foundry

18) IBM Cloud

19. Infrastructure as a code (IaaC) with Terraform

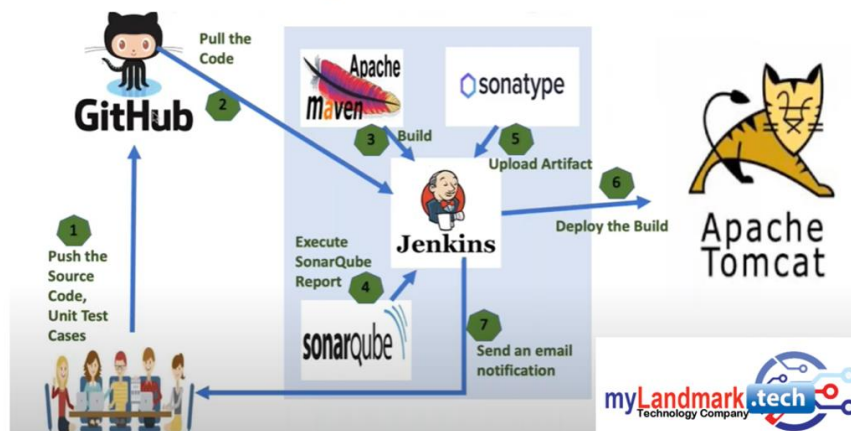
- ❖ What is Terraform
- ❖ Importance of Terraform over other IaaC tools
- ❖ Terraform installation on Windows and Linux
- ❖ Infrastructure automation using Terraform and Ansible

20. Projects

1. Jenkins integration with GitHub, Maven, SonarQube, Nexus and Tomcat for an e-commerce client

DevOps Project 1: www.mylandmark.tech

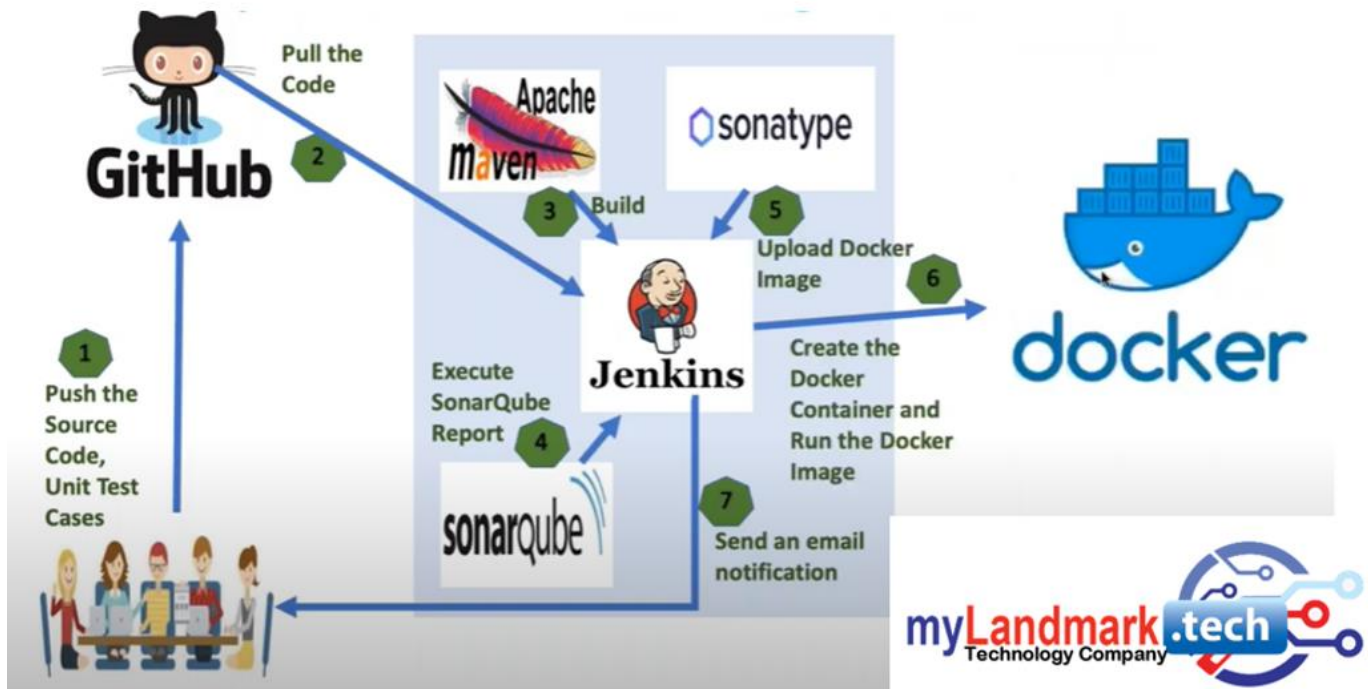
Tel: + 1 437 215 2483

Email: mylandmarktech@gmail.com

2. Jenkins integration with GitHub, Maven, SonarQube, Nexus and Docker for an e-commerce client

DevOps Project 2: www.mylandmark.tech

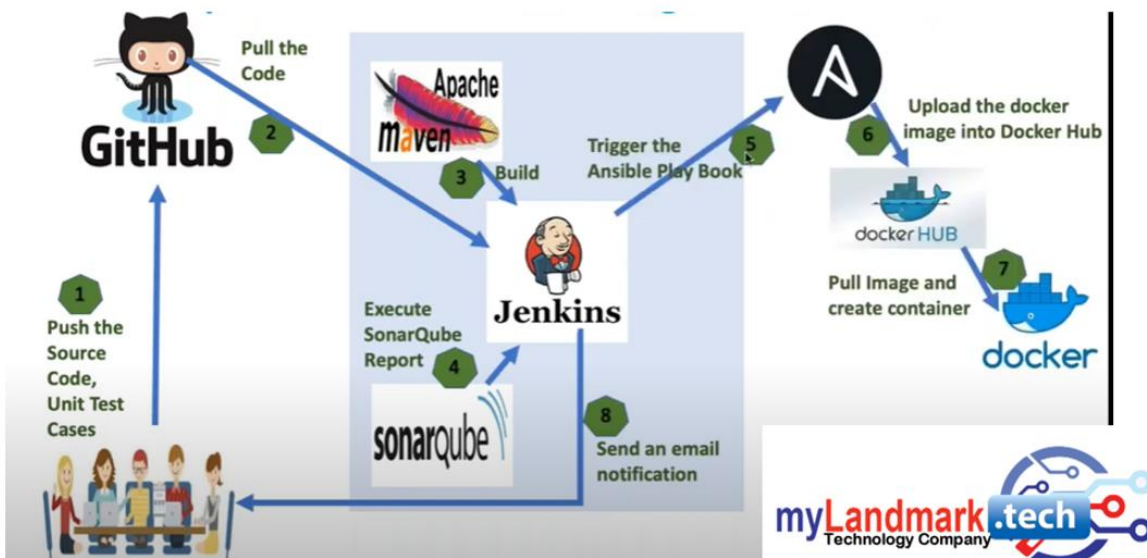
Tel: + 1 437 215 2483



3. Jenkins integration with Maven, SonarQube, Ansible and Docker

DevOps Project 3: www.mylandmark.tech

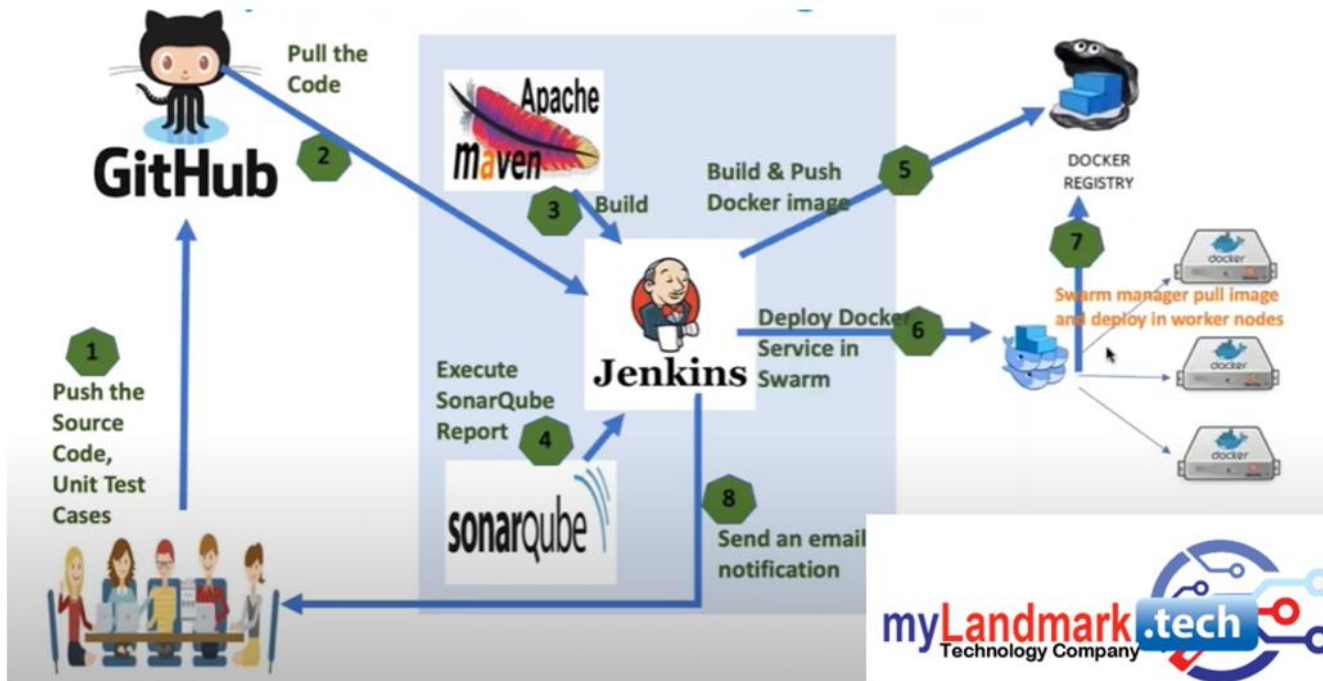
Tel: + 1 437 215 2483



4. Jenkins integration with Maven, SonarQube, Docker and Docker Swarm

DevOps Project 4: www.mylandmark.tech

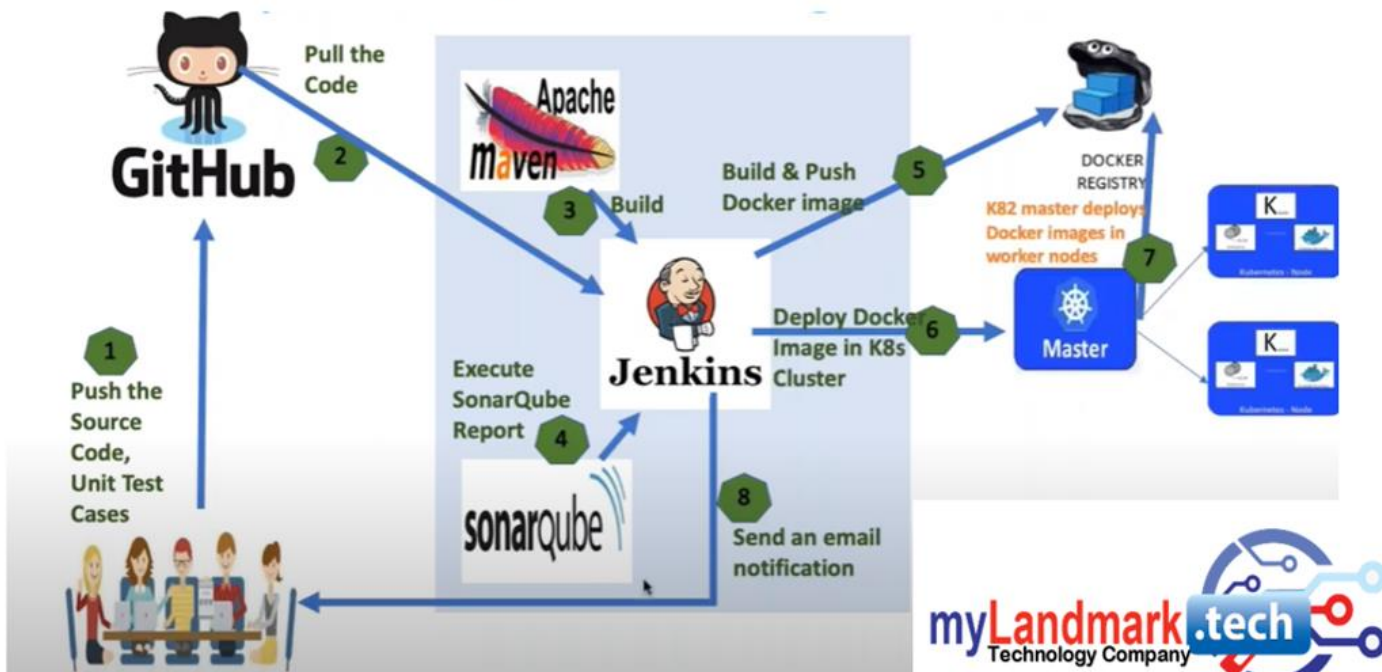
Tel: + 1 437 215 2483



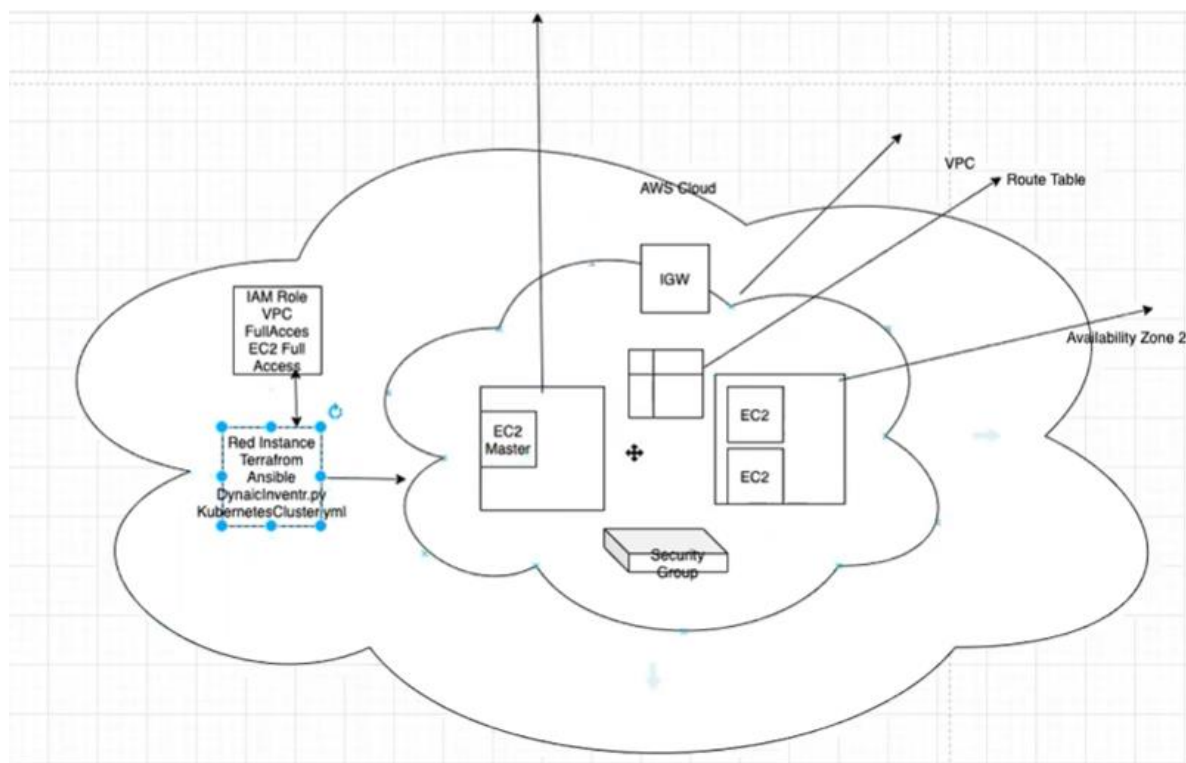
5. Jenkins integration with Maven, SonarQube, Docker and Kubernetes

DevOps Project 5: www.mylandmark.tech

Tel: + 1 437 215 2483 -



6. Infrastructure automation using Terraform and Ansible



- FOLLOW ALL INSTRUCTIONS FROM LANDMARK TECHNOLOGY
- Run commands
- 7 days – $7 < x < 10$