MINDBOX TRAININGS

Kubernetes and DevOps Program

GET STARTED

MODULE A

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PRE-REQUISITES

Day 1 : Lab environment setup, AWS Account Creation and Linux Basics
Day 2 : Linux - Basic commands, Linux Shell
Day 3: Linux - Installations
Day 4: Introduction to software and Webapplications (Apache, wordpress)
Day 5 :Web Applications and Linux Deployments, HTTP (Apache, wordpress)
Day 6 :Neworking - IP masking, Private and Public Networks,
Day 7 :Networking - DNS, NAT, Running your own website
Day 8:Containerization - Basic Concepts, Getting Started with Docker (Docker,images, containers)
Day 9: Containerization - Run wordpress web
and database services in Docker containers (Wordpress, LAMP stack)
Day 10: Containerization - Orchestration overview, Cloud Overview (GCP, Kubernetes introduction)

ASSIGNMENTS

1.Learn and Practice 50 Linux commands
2 Set up a PHP Based web application on AWS Server (wordpress)
3.Setup A Java Based Web application on AWS Server
4.Register and Run your own public website
5.Web Server Related assignments (HTTP redirection, HTTP Authentication)
6.Transfer files between your Laptop and Cloud machine through sFTP
7.Dockerize assignments 2 and 3
8.Create a Google Cloud account and run the docker containers in cloud

MODULE B

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CONTINUES INTEGRATION AND CONTINUES DELIVERY

Day 1: Git - Introduction to CI/CD,
Project overview - (Java, Javascript and Pythin based projects)
Day 2:Git - Archetecture, Developer workflow, Best Practices,
Day 3:Git - Branching, CI/CD and SCM, Best Branching practices, Tagging
Day 4:Git - Github and Continues Integration Practices
Day 5:Building - Introduction to build tools - Ant, Maven, NPM, PIP, Compose (Java, Javascript and Pythin based projects)
Day 6:Building - Dockerizing your applications and microservices
Day 7:Building - Docker registry, Tagging and Best Practices
Day 8:Deploying - Minikube and Development environment deployments, Kubernetes services, Deployments, and Pods
Day 9: Jenkins - integration with docker, registry, build tool, github etc
Day 10:Jenkins - Automated pipelines, Multi envoronment deployments
Day 11:Jenkins - Master/slave, Build Triggers, Upstream/Downstream, Jenkins Kubernetes plugin

ASSIGNMENTS

1.Setup best branching practices for your reference project. Justify your approach
2 Decide the Tagging practices for reference project
3.Setup Github account. Migrate your Remote repository to Github
4.Setup Jenkins server to Automatically build an automated pipeline
5.Setup Minikube and create a development environment for deployments
6.Integrate your selenium webapplication testing tool with Jenkins
7.Publish the reports in HTML form using Jenkins
8.Create a Jenkinsfile to automate all above assignments
9.Implement all CI/CD practices you learned on a Project

MODULE C

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CONFIGURATION MANAGEMENT AND MONITORING

Day 1:Introduction to Configuration Management and Ansible, Project overview - Web and DB services
Day 2:Ansible - Anisble commandline, Inventory, Groups
Day 3:Ansible - Playbooks, Variables, and Templates
Day 4:Ansible - Web, DB services and their configurations, Variables hierarchy
Day 5:Anisble - Roles, Best Practices
Day 6:Ansible - Ansible Galaxy and Introduction to professional role development
Day 7:Ansible - Project Practices, Variables, Facts, Dymanic Inventory
Day 8:Nagios - Continues Monitoring, Definitions - Hosts, Services, Commands, Groups, timeperiods etc.
Day 9: Nagios - Developing Plugins, check over ssh, remote monitoring,
Day 10:Nagios - Dynamic configurations, Automating Nagios administration, Final assignment

ASSIGNMENTS

1.Setup a wordpress environment using Ansible
2 Use Ansible roles to build wordpress configurations
3.Plan a retail project Configuration Management
4.Implement your proposed retail project configuration using Anisble
5.Setup Continues Monitoring on your retail project using Nagios

MODULE D

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ADVANCED KUBERNETES TRAINING

Day 1:Introduction to containerization, Benefits, Project Overview
Day 2:Docker - Building Docker images, Migrating to Docker
Day 3:Docker - Publishing images and best practices to store them and tag them
Day 4:Kubernetes - Introduction to Production environment and Best Practices
Day 5:Kubernetes - Container Orchestration, On-premise Kubernetes Cluster Setup
Day 6:Kubernetes - Replicasets, Deployments and Pods
Day 7:Kubernetes - Services, Ingress, LoadBalancers, Persistant volumes, data management, PVC
Day 8:Kubernetes - Cloud Vs On-premise, Namespaces, Service Accounts
Day 9: Kubernetes - Networking, DNS concepts, Configuration Management
Day 10:Helm - Kubernetes Package Management using helm
Day 11: Helm - Advanced Project configurations and multi deployments

ASSIGNMENTS

1.Migrate your monolithic project to kubernetes
2 Create configurations for your microservice based project in Kubernetes
3.Automate your kubernetes deployments using helm
4.Kubernetes Migration workflow
5.Kubernetes Volume management for a critical data based project

MODULE E

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CONTAINER ORCHESTRATION ON CLOUD

Day 1:Container orchestration in Cloud - AWS, Microsoft Azure, Google Cloud
Day 2:Google Cloud - Kubernetes engine, Container Registry
Day 3:Google Cloud - Workloads, Applications, Services, Ingress
Day 4:Google Cloud - Volumes, Storage class, Disks
Day 5:AWS - ECR, EKS
Day 6:AWS - LoadBalacers, Autoscaling cluster, Serverless
Day 7:Azure - Kubernetes Cluster in Azure Cloud
Day 8:Azure - Registry, Directory integration, Autoscaling
Day 9: Azure - Networking
Day 10:Kubernetes - On-premise Vs Cloud Comparison

ASSIGNMENTS

1.Migrate your monolithic project to kubernetes
2 Create configurations for your microservice based project in Kubernetes
3.Automate your kubernetes deployments using helm
4.Kubernetes Migration workflow
5.Kubernetes Volume management for a critical data based project

MODULE F

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SHELL SCRIPTING AND PYTHON PROGRAMMING (SELF PACED COURSE)

Shell Scripting:

- Linux Shell
- Introduction to Bash
- Introduction to Linux process
- Positional Parameters
- Conditional statements
- Loops in Bash
- Function
- GetOps
- Case statement
- Linux Administration using shell scripting
- Real time scripts for different system administration activities

PYTHON PROGRAMMING:

- Why Python?
- Introduction to Object oriented programming
- Interactive programming concepts
- Data Types - Dictionary, List and Tuples
- Loop, Function, conditional statements
- Python modules and real time use
- Creating module in python
- Practical scripts and real time examples

CHEF (SELF PACED COURSE)

* Using Chef resources – the building blocks
* Building Chef recipes and cookbooks
* Attributes and Dynamic configurations
* Chef Templates and Variables
* Workstation setup
* Centralizing management with Chef Server
* Using Community Cookbooks
* Automating chef-client runs
* Managing a multi-node infrastructure
* Simplification and scalability through Roles
* Staging versus Production - Environments

AWS (AMAZON WEB SERVICES) (SELF PACED VIODES)

* Introduction to AWS Global Infrastructure
* EC2 - Manage Virtual Machines, EBS and Backups
* VPC - Building highly available private networks in AWS
* Elastic LoadBalancers - Achieving High availability and Fault tolerance for applications
* Autoscaling - Automate scalability based on requirements
* Route 53 - DNS Services and Global location failover services
* S3 - Object storage in AWS to store you application static data
* IAM - Identity and Access Management to your AWS resources
* RDS - Relational Databases as a Service in Cloud
* SES - Sending out emails through SES and integrate with your applications
* Cloudwatch - Monitoring your AWS Cloud resources
* CloudFront - CDN services for your static data
* Command Line tools - Automate AWS resource management through command line
* Python Boto module - Managing AWS resources through your Python program

FINAL PROJECT

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PROJECT DESCRIPTION

You will work on an advanced project after you completed all topics. Its an open source project purely based on micro services which extensively use best DevOps practices.

This open-source project currently used following tools and technologies

Ansible for config management
Docker as Container run time
Docker swarm as Orchestration tool
CircleCI and Jenkins for CI/CD process
Git for SCM

Your responsibility is to make the project ready to run on a Kubernetes Cluster (Both On-Premise and Cloud). Some of your responsibilities would include

- Migrating Ansible configuration to Kubernetes configMaps
- Migrate Swarm configurations to Kubernetes Yaml files
- Migrate CircleCI to Jenkins
- Maintain Same Docker builds and maven build files.
- Add more features to the product.
- And Many more

At the end, the project should be ready to run on Kubernetes Cluster.

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