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Development Partner

Oracle Authorized Training Partner



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DevOps - Docker and Kubernetes Training

Duration: 32Hrs

Docker Course Content

1: Orchestration

Content may include the following:

- Complete the setup of a swarm mode cluster, with managers and worker nodes
- State the differences between running a container vs running a service
- Demonstrate steps to lock a swarm cluster
- Extend the instructions to run individual containers into running services under swarm
- Interpret the output of “docker inspect” commands
- Convert an application deployment into a stack file using a YAML compose file with “docker stack deploy”
- Manipulate a running stack of services
- Increase # of replicas
- Add networks, publish ports
- Mount volumes
- Illustrate running a replicated vs global service
- Identify the steps needed to troubleshoot a service not deploying
- Apply node labels to demonstrate placement of tasks
- Sketch how a Dockerized application communicates with legacy systems
- Paraphrase the importance of quorum in a swarm cluster
- Demonstrate the usage of templates with “docker service create”

2: Image Creation, Management, and Registry

Content may include the following:

- Describe Dockerfile options [add, copy, volumes, expose, entrypoint, etc]
- Show the main parts of a Dockerfile
- Give examples on how to create an efficient image via a Dockerfile
- Use CLI commands such as list, delete, prune, rmi, etc to manage images
- Inspect images and report specific attributes using filter and format
- Demonstrate tagging an image
- Utilize a registry to store an image
- Display layers of a Docker image
- Apply a file to create a Docker image
- Modify an image to a single layer
- Describe how image layers work

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- Deploy a registry (not architect)
- Configure a registry
- Log into a registry
- Utilize search in a registry
- Tag an image
- Push an image to a registry
- Sign an image in a registry
- Pull an image from a registry
- Describe how image deletion works
- Delete an image from a registry

3: Installation and Configuration

Content may include the following:

- Demonstrate the ability to upgrade the Docker engine
- Complete setup of repo, select a storage driver, and complete installation of Docker engine on multiple platforms
- Configure logging drivers (splunk, journald, etc)
- Setup swarm, configure managers, add nodes, and setup backup schedule
- Create and manager user and teams
- Interpret errors to troubleshoot installation issues without assistance
- Outline the sizing requirements prior to installation
- Understand namespaces, cgroups, and configuration of certificates
- Use certificate-based client-server authentication to ensure a Docker daemon has the rights to access images on a registry
- Consistently repeat steps to deploy Docker engine, UCP, and DTR on AWS and on premises in an HA config
- Complete configuration of backups for UCP and DTR
- Configure the Docker daemon to start on boot

4: Networking

Content may include the following:

- Create a Docker bridge network for a developer to use for their containers
- Troubleshoot container and engine logs to understand a connectivity issue between containers
- Publish a port so that an application is accessible externally
- Identify which IP and port a container is externally accessible on
- Describe the different types and use cases for the built-in network drivers

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- Understand the Container Network Model and how it interfaces with the Docker engine and network and IPAM drivers
- Configure Docker to use external DNS
- Use Docker to load balance HTTP/HTTPS traffic to an application (Configure L7 load balancing with Docker EE)
- Understand and describe the types of traffic that flow between the Docker engine, registry, and UCP controllers
- Deploy a service on a Docker overlay network
- Describe the difference between “host” and “ingress” port publishing mode

5: Security

Content may include the following:

- Describe the process of signing an image
- Demonstrate that an image passes a security scan
- Enable Docker Content Trust
- Configure RBAC in UCP
- Integrate UCP with LDAP/AD
- Demonstrate creation of UCP client bundles
- Describe default engine security
- Describe swarm default security
- Describe MTLS
- Identity roles
- Describe the difference between UCP workers and managers
- Describe process to use external certificates with UCP and DTR

6: Storage and Volumes

Content may include the following:

- State which graph driver should be used on which OS
- Demonstrate how to configure devicemapper
- Compare object storage to block storage, and explain which one is preferable when available
- Summarize how an application is composed of layers and where those layers reside on the filesystem
- Describe how volumes are used with Docker for persistent storage
- Identify the steps you would take to clean up unused images on a filesystem, also on DTR
- Demonstrate how storage can be used across cluster nodes

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Kubernetes Course content

Kubernetes Setup
Local Setup with minikube
Installing Kubernetes using the Docker Client
Minikube vs Docker Client vs Kops vs Kubeadm
Introduction to Kops
Preparing kops install
Preparing AWS for kops install
Cluster setup on AWS using kops
Building docker images
Docker Image Registry
Pushing Docker Image
Running first app on Kubernetes
Useful commands
Service with LoadBalancer
Service with AWS ELB LoadBalancer
Kubernetes Basics
Node Architecture
Replication Controller
Deployments
Services
Labels
NodeSelector using Labels
Healthchecks
Readiness Probe
Liveness and Readiness probe
Pod State
Pod Lifecycle
Secrets
Credentials using Volumes
Running Wordpress on Kubernetes
Web UI in Kops
WebUI

Advanced Topics

Service Discovery
ConfigMap
Ingress Controller
External DNS

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Volumes
Volumes Autoprovisioning
Wordpress With Volumes
Pod Presets
StatefulSets
Daemon Sets
Resource Monitoring using Metrics Server
Autoscaling
Affinity / Anti-Affinity
Interpod Affinity and Anti-affinity
Taints and Tolerations
Custom Resource Definitions (CRDs)
Operators
postgresql-operator
Kubernetes Administration
The Kubernetes Master Services
Resource Quotas
Namespace quotas
User Management
Adding Users
RBAC
Networking
Node Maintenance
High Availability
TLS on ELB using Annotations
Packaging and Deploying on Kubernetes
Introduction to Helm
Helm
Creating your own Helm Charts
nodejs app Helm Chart
Setting up a Helm Repository on S3
Building and Deploying Helm Charts with Jenkins
Serverless on Kubernetes
Introduction to Serverless
Introduction to Kubeless
Creating Functions with Kubeless
Triggering Kubeless Functions with Kafka
Microservices
Introduction to Istio
Istio Installation
An Istio enabled app

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Advanced routing with Istio
Canary Deployments
Retries
Mutual TLS
RBAC with Istio
End-user authentication with istio (JWT)
Istio Egress traffic
Distributed Tracing with Jaeger
Istio's Grafana Metrics
Installing Kubernetes using kubeadm
Introduction to kubeadm
kubeadm
On-Prem or Cloud Agnostic Kubernetes
Managing TLS Certs with Cert-Manager

For Any Clarification please feel free to contact @ +91 9867328291.

Cheers,

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