Docker & Kubernetes

Course Outline

Module 1: Introduction to Container and Docker

- What are containers?
- Container Use Cases
- Docker Installation
- Docker commands basic and flags
- Building a Docker File
- Docker Image basics
- Building a docker image using docker file
- Launching a container
- Accessing the Container
- Image management
- Docker Hub
- Downloading Docker images
- Managing Containers
- "Introduction to Docker Networking & Network Types"
- Container orchestration - why do we need it?
- Popular container orchestration tools overview (Kubernetes, OpenShift etc.)
- Overview of Public Cloud offerings for container orchestration

Module 2: K8s Cluster Architecture, Installation & Configuration

- Manage role-based access control (RBAC)
- Use Kubeadm to install a basic cluster.
- Manage a highly available Kubernetes cluster.
- Provision underlying infrastructure to deploy a Kubernetes cluster.
- Perform a version upgrade on a Kubernetes cluster using Kubeadm.
- Implement etcd backup and restore.

Module 3: Workloads & Scheduling

- Understand deployments and how to perform rolling update and rollbacks.
- Use ConfigMaps and Secrets to configure applications.
- Know how to scale applications.
- Understand the primitives used to create robust, self-healing, application deployments.
- Understand how resource limits can affect Pod scheduling.
- Awareness of manifest management and common templating tools

Module 4: Services & Networking

- Understand host networking configuration on the cluster nodes.
- Understand connectivity between Pods.
- Understand ClusterIP, NodePort, Load Balancer service types and endpoints.
- Know how to use Ingress controllers and Ingress resources.

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- Know how to configure and use CoreDNS.
- Choose an appropriate container network interface plugin.

Module 5: Storage

- Understand storage classes, persistent volumes.
- Understand volume mode, access modes, and reclaim policies for volumes.
- Understand persistent volume claims primitive.
- Know how to configure applications with persistent storage.

Module 6: Troubleshooting

- Evaluate cluster and node logging.
- Understand how to monitor applications.
- Manage container stdout & stderr logs.
- Troubleshoot application failure.
- Troubleshoot cluster component failure.
- Troubleshoot networking.