

Docker and Kubernetes Training



The Docker and Kubernetes course offers a comprehensive curriculum designed to equip learners with the necessary skills to master containerization and orchestration technologies. The course content includes an introduction to Docker, covering topics such as container basics, images, and Docker Compose. It further delves into Kubernetes, exploring concepts like pods, services, deployments, and scaling. Participants learn how to create and manage containers, deploy applications to Kubernetes clusters, and optimize resource utilization. The course also covers advanced topics such as container networking, storage management, security, and monitoring. Hands-on exercises and real-world projects enhance the learning experience, empowering students to confidently navigate the world of containerization and orchestration.

Course Outline:

Day1 to 2: Docker Fundamentals and Deep Dive:

- Problems with VM Deployment
- VMs Vs/ Containers
- Microservices and containers
- Introduction to Docker
- Introduction to Containers
- Docker Ecosystem
- Docker Components
- Docker Architecture
- Classroom Environment with Docker setup (Prepare Lab for Docker)

- Containers Creations
- Containers Operations
- Docker – Images Operations
- DockerHub
- Registry and Repositories in Docker
- Docker - Building Images
- Image Build with Dockerfile
- Check the validity of the Dockerfile
- Run docker compose
- Stop docker
- Scale the containers
- Container Network Model
- Docker Volume
- Bind mounts Volume
- Advantage of Volumes over bind mounts
- Create volumes
- Run container on volumes
- Remove volume

Day2 to 5: Kubernetes Fundamentals and Deep Dive

- Introduction to Microservices
- What is Kubernetes
- Why Kubernetes
- Kubernetes Cluster objects overview

- Kubernetes Cluster Installation Methods
- Overview of Kubernetes HA architecture
- Calico Network setup for Installation
- Kubernetes communication and Architecture
- Upgrading Kubernetes cluster
- Creating and Managing Pods
- Overview of POD create workflow
- Deploying pods using YAML
- Manual Scheduling Pods
- Taint and Tolerations
- Cordon & uncordon Kubernetes cluster nodes
- Node Affinity & anti-affinity
- Inter pod Affinity & anti-affinity
- Liveness & Readiness probes
- Managing Replication Controller & Replica Set
- Managing Daemon Sets
- Overview of Deployment
- Managing Deployment
- Overview of StatefulSets
- Managing StatefulSets
- Deployment Vs Statefulset
- Cronjob and JOB
- Kubernetes services overview.
- Overview of Kubernetes Labels and Selectors

- Managing Labels & Selector
- Accessing POD using Kubernetes service
- Kubernetes Services various implementation operations
 - NodePort
 - Cluster IP
 - Load Balancers
- Service discovery using DNS
- Managing compute resource (CPU & Memory)
 - Kubernetes object deletion process
 - Application update strategies
 - application Updates strategies statefulset, daemonset and deployment
 - Scale up an application
 - Scale down an application
 - Overview of Kubernetes storage
 - What is volume in Kubernetes
 - Why we need volumes?
 - Storage Provisioning in Kubernetes
 - Persistent volumes and claims
 - Service Account
 - security context
 - Roles and Role Binding
 - Cluster Role and Cluster Role Binding
 - Environment Variable using Configmap and Secret and plain key

- Pod networking
- How cni works
- Cni plugin invocation

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