CodeCruise

SAIL SMOOTH IN TECH OCEAN

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## Docker Fundamentals

**Docke**r is a popular platform for developing, shipping, and running applications using containerization. Docker is a set of platform as a service products that use OS-level virtualization to deliver software in packages called containers. The service has both free and premium tiers. The software that hosts the containers is called Docker Engine

## Tech Stack To Be Covered

Docker

## Docker Fundamentals

**Module 1: Introduction to Docker**

- Understanding containerization
- Overview of Docker and its ecosystem
- Use cases and benefits of Docker

**Module 2: Getting Started with Docker**

- Installing Docker on different platforms (Windows, macOS, Linux)

- Docker Engine architecture and components
- Running your first Docker container

**Module 3: Working with Docker Images**

- Understanding Docker images and layers
- Pulling and pushing Docker images from/to Docker Hub
- Creating Docker images using Dockerfiles

**Module 4: Docker Containers**

- Managing Docker containers: start, stop, restart, and remove
- Inspecting container logs and stats
- Networking in Docker: connecting containers and exposing ports

**Module 5: Docker Volumes and Data Management**

- Understanding Docker volumes
- Persisting data with Docker volumes and bind mounts
- Managing data in Docker containers

**Module 6: Docker Compose**

- Introduction to Docker Compose
- Defining multi-container applications using Compose files
- Running and managing multi-container applications with Docker Compose

**Module 7: Docker Networking**

- Overview of Docker networking modes
- Configuring custom networks in Docker
- Communication between Docker containers

**Module 8: Docker Swarm**

- Introduction to Docker Swarm mode
- Creating and managing Docker Swarm clusters
- Deploying and scaling services in Docker Swarm

**Module 9: Docker Security**

- Container isolation and security best practices
- Securing Docker daemon and containers
- Role-based access control (RBAC) in Docker

**Module 10: Docker Best Practices and Tips**

- Dockerfile best practices
- Container orchestration and scalability tips
- Monitoring and logging Docker containers

**Module 11: Docker in Production**

- Building a CI/CD pipeline with Docker
- Deployment strategies for Dockerized applications
- High availability and fault tolerance with Docker

**Module 12: Docker and Cloud Services**

- Integration of Docker with cloud platforms (AWS, Azure, Google Cloud)
- Docker on Kubernetes: using Kubernetes with Docker containers
- Serverless computing with Docker and AWS Lambda