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Course Content

Docker & Kubernetes

Course Name
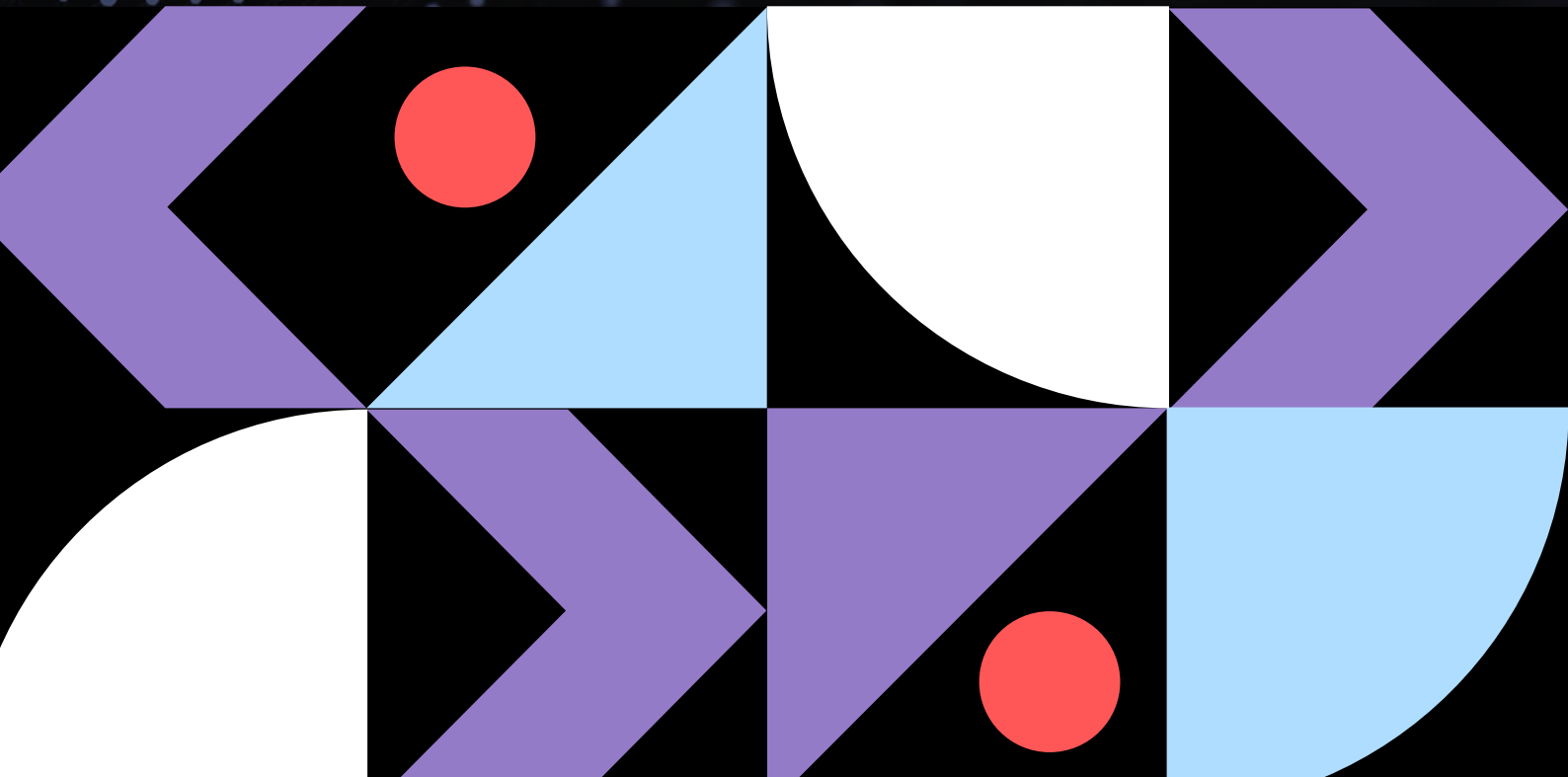
Docker Technologies

Course Outline

Introduction to Docker
History & Philosophy
Understanding Docker
Docker vs Virtual Machines

Docker Components
Docker Engine
Docker Machine
Docker Compose
Docker Images
Docker Containers
Docker Hub (Registry and Repositories)

Classroom Environment
Docker Machine
Docker Configuration

Docker Images & Containers
Understanding images & containers
Access on images
Find & run images
Commands for working with images & containers
Container Management, lifecycle and operations
Benefits of images & containers
Looking inside containers

Build, Manage & Distribute Images
Introducing Dockerfile
Creating Dockerfile
Dockerfile Directives: USER and RUN
Dockerfile Directives: RUN Order of Execution
Dockerfile Directives: ENV
Dockerfile Directives: CMD vs. RUN
Dockerfile Directives: ENTRYPOINT
Dockerfile Directives: EXPOSE
Build Process
Running a container with your Dockerfile

Container Configuration
Building Containers
Managing Containers
Run-Time Configuration
Containers & Applications
Binding containers with host/port
Cleaning up unused images on a filesystem
File System in containers

Docker Container – Deep Dive
Container Volume Management
Docker Network: List and Inspect
Docker Network: Create and Remove
Docker Network: Assign to Containers

Docker Commands and Structures
Inspect Container Processes
Naming Our Containers
Managing and Removing Base Images
Saving and Loading Docker Images
Transferring Docker Images

Podman & Buildah

Course Outline

Introduction & Fundamentals of Kubernetes

Introduction to Microservices
What is Kubernetes
Why Kubernetes
Kubernetes Cluster objects overview
Kubernetes Cluster Installation Methods
Production method installation for complete setup
Calico Network setup for Installation
Kubernetes communication and Architecture
Kubernetes Pods various implementation operations
Kubernetes Labels and Selectors various implementation operations
Kubernetes Replicasets various implementation operations
Kubernetes Deployments various implementation operations

Kubernetes Services various implementation operations
NodePort
Cluster IP
Load Balancers
Kubernetes object deletion process

Scale up an application
Scale down an application
Rolling updates
Real Time Examples for Webservers like nginx, tomcat etc.
Dashboard for Kubernetes implementation
Other Critical Kubernetes objects and their implementation

PV
PVC
Secrets
Cron Jobs
Configmaps
Deployment methods for Kubernetes ready application (helm or other related offerings)
Deploy Kubernetes applications on local and cloud platform

Kubernetes Deep Dive

Cluster Auto Scaler
Horizontal Pod Autoscaler (HPA)
Pod Disruption Budget
Health-Checks
Deploy application on AKS (Azure Kubernetes Service)
K8S Setup and deploy application bare-metal
Monitoring solutions for K8's
Calico CNI
Kubernetes with Calico
MetalLB with Kubernetes
Helm Charts
Managing user access with RBAC

Final Closure