



## **Kubernetes-Docker-Terraform Training Content**

### **DOCKER: -**

- 1) Understanding VM's and Containers.
- 2) Benefits of Containerization.
- 3) What is Docker?
- 4) Comparing VM and Docker.
- 5) Advantages of Docker.
- 6) Docker Architecture and Taxonomy.
- 7) Installing Docker on Linux VM
- 8) Pulling Images
- 9) Starting and Stopping Containers
- 10) Running a Container in interactive mode
- 11) Creating Image from current state of Container
- 12) Important Docker Commands
- 13) Executing custom applications as Containers.
- 14) Inspecting the Image Architecture
- 15) Multiple stages in Docker file
- 16) Benefits of Multi-Stage builds.
- 17) Docker Volume
- 18) Docker composes.
- 19) Docker Registry

### **Kubernetes: -**

- 1) Introduction to Kubernetes and its Architecture
- 2) What is Kubernetes?
- 3) Why Kubernetes
- 4) Kubernetes features
- 5) Kubernetes Architecture
- 6) Kubernetes Cluster
- 7) Kubernetes Master o API Server o Etc o Scheduler o Controller Manager
- 8) Worker nodes • Container Runtime o Kubelet o Kube-proxy o cAdvisor
- 9) Kubernetes Objects Overview DOCKER COMPOSE NETWORKING & PORT FORWARDING DOCKER REGISTRY KUBERNETES SYLLABUS o Kubernetes Pods o Replication Controllers and Replication sets o Deployments o Services o Volumes and Persistent Volumes o Stateful Sets o Daemon Sets o Jobs and Cron Jobs
- 10) AKS/EKS Working with Pods and Kubectl Commands
- 11) Create out first pod with kubectl
- 12) Basic Kubectl Commands
- 13) Inspecting Kubernetes Objects using kubectl
- 14) About Kubernetes Generators
- 15) Imperative vs Declarative Commands
- 16) Exploring YAML Syntax o Name and Metadata o Labels and Label Selectors
- 17) Kubernetes Namespace
- 18) Kubernetes Generators
- 19) Working with Dashboard
- 20) Pods
- 21) Replication Controller

- 22) Replica Sets
- 23) Creating Deployment
- 24) Self Healing Applications.
- 25) Handling Rolling Updates and Rollbacks
- 26) Best practices in rolling upgrades, canary deploys, blue green deploys etc
- 27) Service Types o Creating a Cluster IP Service o Creating a Node Port o Load Balancer Service
- 28) Working with Ingress
- 29) Ingress Controllers
- 30) Ingress Annotations and rewrite target **INSTALLING KUBERNETES INSTALLATION WORKING WITH KUBERNETES OBJECTS SERVICES AND INGRESS**
- 31) Kubernetes Services DNS
- 32) Network Policies
- 33) Working with Probes
- 34) ConfigMap and Environment Variables
- 35) Working with Secrets and sensitive information
- 36) Kubernetes Volumes
- 37) Persistent Volumes and Persistent Volume Claims
- 38) Stateful Set
- 39) Daemon Sets
- 40) Jobs
- 41) Scheduling using Cron Jobs
- 42) Monitoring and Probes
- 43) About AKS
- 44) Creating AKS Cluster using Portal
- 45) Creating AKS Cluster using CLI
- 46) Connecting to AKS Cluster using Kubectl
- 47) Deploying Kubernetes Objects to AKS
- 48) Pulling Images from ACR and Docker Hub
- 49) System Nodes vs User Nodes
- 50) AKS Networking: Azure CNI vs Kubenet
- 51) AKS Logging and Monitoring
- 52) Kubernetes Dashboard
- 53) Manage Memory,
- 54) CPU and API resources.
- 55) Authentication and Authorization
- 56) Using RBAC Authorization

**Helm: -**

- 1) What is Helm and how to install it
- 2) What is Helm and how to install it
- 3) Helm charts, Templates, Release, Revisions and Repositories
- 4) How to Deploy, Upgrade and Roll Back Helm charts
- 5) How to Create and host your helm charts

**Terraform: -**

1. Create database server using Terraform.
2. Create VM using Terraform.
3. Create Azure services using Terraform.
4. Introduction to Terraform

5. Overview of Terraform architecture
6. Obtaining and installing Terraform
7. Terraform CLI
8. Infrastructure lifecycle
9. Language Components
10. Resources
11. Data Sources
12. Terraform Providers - AWS, Microsoft Azure, Google Cloud, On-premise
13. Modules
14. Input and output variables
15. Complex variable types
16. Locals
17. Validation rules
18. Interpolation
19. Expressions & Functions
20. State Management
21. Managing state files
22. State file structure
23. Backend configuration (Terraform Cloud, Azure, AWS)
24. State locking
25. Inspecting and modifying state
26. Importing resources
27. Environment Variables
28. Dealing with parameters
29. Environment variable options and precedence
30. Automatic loading of variables
31. Variables in Terraform Cloud
32. Key variables (TF\_LOG, TF\_VAR\_name...)
33. Managing Resources
34. Implicit and Explicit Dependencies
35. Non-dependant Resources
36. Using triggers
37. Iterating on Resources
38. Conditional resources
39. Maintenance and Troubleshooting
40. Debugging Terraform
41. Verbose Logging and log levels
42. Writing logs to files
43. Error messages

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3rd Floor, No: 92/5, ACR Greens, Opp. Salarpuria, Outer Ring Road, Beside  
Biryani Zone, Marathahalli, Bangalore - 560037; [info@saagtech.com](mailto:info@saagtech.com)  
[www.saagtech.com](http://www.saagtech.com) Phone: +91-94 916 28222 / +91-94 916 29222

**+91 94 916 28222 | [info@saagtech.com](mailto:info@saagtech.com) | [www.saagtech.com](http://www.saagtech.com)**