

Part 1: Linux security and automation (8 Modules)

1. Introduction to Linux & Basic Commands

- Overview of Linux distributions
- Navigating the file system (ls, cd, cp, mv, rm)
- File permissions and ownership (chmod, chown)

2. Text Processing & File Management

- Managing files with cat, grep, find, awk, sed
- File compression (gzip, tar, zip)
- Creating and editing files with vi, nano

3. Process Management & Job Control

- Understanding processes and jobs (ps, top, htop)
- Managing foreground and background jobs
- Killing processes and using nice for priority control

4. User and Group Management

- Creating and managing users and groups
- Understanding /etc/passwd and /etc/group
- Using sudo and setting up user privileges

5. Linux Networking Basics

- Configuring IP, DNS, and routes
- Network commands: ping, netstat, ifconfig, ip
- Using ssh for remote connections

6. Disk Management and Partitioning

- Creating and managing partitions with fdisk, parted
- Mounting and unmounting file systems
- Understanding filesystems (ext4, xfs, etc.)

7. File Permissions & ACLs

- Understanding chmod, chown, and chgrp
- Configuring Access Control Lists (ACLs)
- Managing file attributes with lsattr, chattr

8. Linux Security Basics

- Firewall configuration with iptables and ufw
 - Configuring SSH keys for secure access
 - Basic Linux hardening techniques
 - Install Git on a Linux server.
 - Create a repository on a GitHub account.
 - Clone a repository from GitHub.
 - Push and pull a repository.
 - Install and configure a Jenkins server.
 - Integrate Jenkins with GitHub.
 - Create a CI/CD pipeline in Jenkins.
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Part 2: AWS Fundamentals (8 Modules)

9. Introduction to AWS Cloud & Setup

- Introduction to AWS services and console overview
- Creating and managing AWS accounts
- AWS pricing and cost management

10. AWS Identity and Access Management (IAM)

- Creating users, groups, and roles
- IAM policies and permissions
- Multi-Factor Authentication (MFA) and security best practices

11. Networking in AWS

- VPC, subnets, route tables, and internet gateways
- Setting up NAT gateways and bastion hosts
- AWS Security Groups and Network ACLs

12. Compute in AWS: EC2 Instances

- Launching, managing, and configuring EC2 instances
- EC2 instance types and pricing models
- Auto Scaling and Elastic Load Balancers (ELB)

13. **AWS Storage Services**

- Amazon S3: Buckets, objects, and policies
- EBS volumes, snapshots, and backup strategies
- Elastic File System (EFS) for shared storage

14. **AWS Security & Monitoring**

- Using AWS CloudTrail and CloudWatch for monitoring
- Security best practices with AWS Shield and WAF
- AWS encryption options (KMS, S3 encryption)

15. **Elastic Load Balancing & Auto Scaling**

- Setting up Application and Network Load Balancers
- Configuring auto-scaling for EC2 instances
- Monitoring and managing scalability

16. **Advanced AWS Networking**

- Setting up Virtual Private Networks (VPN)
 - AWS Direct Connect and Peering
 - PrivateLink and Endpoint configurations
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Part 3: Docker Essentials (8 Modules)

17. **Introduction to Containers & Docker**

- What are containers? Introduction to Docker
- Installing Docker on Linux
- Running your first container: Docker CLI basics

18. **Working with Docker Images**

- Understanding Docker images and layers
- Pulling and running images from Docker Hub
- Building custom images with Dockerfile

19. **Docker Volumes & Persistent Storage**

- Mounting volumes to containers
- Managing data with Docker volumes

- Bind mounts and data persistence strategies

20. Docker Networking Basics

- Container networking: bridge, host, and overlay networks
- Exposing ports and managing container communication
- Using Docker network commands

21. Docker Compose for Multi-Container Applications

- Introduction to Docker Compose
- Defining services, networks, and volumes in a docker-compose.yml
- Managing multi-container applications with docker-compose

22. Docker Security Essentials

- Securing Docker containers
- Limiting container privileges
- Image vulnerability scanning

23. Managing Docker Containers

- Start, stop, restart, and remove containers
- Managing container logs and stats
- Using docker exec to run commands inside containers

24. Optimizing Docker Images

- Reducing image size with multi-stage builds
- Best practices for Dockerfile optimization
- Caching and image layer management

Part 4: Kubernetes Essentials (8 Modules)

25. Introduction to Kubernetes

- What is Kubernetes? Overview of core concepts
- Kubernetes architecture: Master and Worker nodes
- Pods, Nodes, and Cluster overview

26. Setting Up a Kubernetes Cluster

- Installing Minikube or Kubernetes on AWS

- Setting up kubectl for cluster interaction
- Understanding kubeconfig and context management

27. Kubernetes Pods & Deployments

- Understanding pods and multi-container pods
- Creating and managing deployments
- Rolling updates and rollbacks in Kubernetes

28. Kubernetes Services

- Service types: ClusterIP, NodePort, LoadBalancer
- Exposing services and accessing applications
- Setting up Ingress Controllers for external access

29. Kubernetes ConfigMaps & Secrets

- Managing environment configurations with ConfigMaps
- Storing sensitive data using Secrets
- Injecting configurations into pods

30. Kubernetes Storage Management

- Persistent Volumes (PVs) and Persistent Volume Claims (PVCs)
- Dynamic volume provisioning
- StatefulSets for stateful applications

31. Scaling Applications in Kubernetes

- Horizontal Pod Autoscaler (HPA)
- Manual and automatic scaling of applications
- Managing resource requests and limits for pods

32. Kubernetes Security & RBAC

- Role-Based Access Control (RBAC) in Kubernetes
- Securing API access and Kubernetes components
- Network policies for securing pod communication