

# DevOps Guide 2025

## Step 1: Linux Fundamentals

### Command Line Interface (BASH):

- - Introduction to shell scripting
- - Basic commands: ls, cd, pwd, mkdir, rm, cp, mv, echo
- - File redirections and piping

### Process & Permissions:

- - Managing processes: ps, top, kill, nice
- - Understanding permissions: chmod, chown, umask
- - Managing users and groups

### Package Management:

- - Using apt in Debian-based systems
- - Using yum in Red Hat-based systems
- - Installing, updating, and removing packages

### Text Editors:

- - Working with Vim and Nano
- - Basic commands and shortcuts

## Step 2: Networking & Security Concepts

### Networking Basics:

- - OSI and TCP/IP models
- - Common protocols: HTTP, HTTPS, FTP, SSH, ICMP
- - Understanding IP addressing and subnetting

### Security Concepts:

- - Understanding firewalls and proxy servers
- - Basics of network security
- - VPNs and secure connections

### Troubleshooting Network Issues:

- - Diagnosing problems with ping, netstat, traceroute, nslookup
- - Managing DNS and resolving domain names

### Advanced Topics:

- - Load balancers and caching servers

## **Step 3: Scripting (Python)**

### **Core Concepts:**

- - Syntax and programming fundamentals
- - File handling and input/output operations
- - Error handling and debugging

### **Writing Automation Scripts:**

- - Automating repetitive tasks
- - Writing and scheduling cron jobs

## **Step 4: Version Control (Git)**

### **Essential Git Commands:**

- - Repository initialization: init, clone
- - Committing changes: add, commit
- - Syncing repositories: push, pull
- - Branching and merging: branch, checkout, merge, rebase

### **Working with Remote Repositories:**

- - Setting up SSH keys for authentication
- - Resolving merge conflicts
- - Git workflows (feature branching, GitFlow)

## **Step 5: Cloud Computing (AWS Focus)**

### **Core AWS Services:**

- - Compute: EC2, Lambda
- - Storage: S3, EBS
- - Databases: RDS, DynamoDB

### **Identity & Access Management (IAM):**

- - Managing users and roles
- - Implementing least privilege access

### **Networking:**

- - Virtual Private Cloud (VPC)
- - Security Groups and Network ACLs

## **Step 6: Microservices & Containers (Docker)**

### **Virtualization vs. Containerization**

#### **Docker Fundamentals:**

- - Understanding images and containers
- - Essential commands: run, ps, build, stop, rm
- - Writing Dockerfiles

#### **Docker Compose:**

- - Managing multi-container applications
- - Defining services, networks, and volumes

## **Step 7: CI/CD (GitLab & Jenkins)**

### **Introduction to CI/CD Pipelines**

- - Continuous Integration vs. Continuous Deployment
- - Automating software delivery

#### **Jenkins:**

- - Installing and configuring Jenkins
- - Creating and managing Jenkins jobs
- - Integrating Jenkins with Git
- - Setting up build pipelines

#### **GitLab CI/CD:**

- - Writing .gitlab-ci.yml files
- - Stages and jobs in GitLab pipelines
- - Runners and pipeline execution

## **Step 8: Infrastructure as Code (IaC)**

### **Terraform:**

- - Writing Terraform configurations
- - Managing infrastructure with Terraform
- - State management and best practices

### **Ansible:**

- - Writing Ansible playbooks
- - Configuring servers with Ansible
- - Managing inventories

## **Step 9: Orchestration & Management (Kubernetes)**

### **Kubernetes Fundamentals:**

- - Understanding Pods, Deployments, Services
- - Managing Kubernetes clusters

### **Key Kubernetes Commands:**

- - apply, get, delete, describe

### **Deployment Strategies:**

- - Rolling updates and blue-green deployments

## **Step 10: Monitoring & Logging**

### **Prometheus & Grafana:**

- - Setting up Prometheus for monitoring
- - Visualizing metrics in Grafana
- - Configuring alerts