# Linux Seminar Themes

## 🔧 DevOps & Automation

1. **CI/CD in Action: Jenkins for Automated Builds**

   ○ **Requirements:** Basic Linux, Git, Java, Jenkins setup

   ○ **Covers:** Jenkins pipelines, job configuration, integration with Git

2. **Docker Essentials: Containerizing Your First App**

   ○ **Requirements:** Linux terminal, Docker

   ○ **Covers:** Dockerfiles, images vs containers, docker-compose

3. **Getting Started with Kubernetes**

   ○ **Requirements:** Docker, kubectl, minikube

   ○ **Covers:** Pods, services, deployments, cluster architecture

4. **Infrastructure as Code with Terraform**

   ○ **Requirements:** Linux, cloud account (AWS/Azure), Terraform CLI

   ○ **Covers:** Terraform configuration, resource provisioning

5. **Ansible for Server Configuration Automation**

   ○ **Requirements:** SSH access, Ansible CLI

   ○ **Covers:** Playbooks, roles, inventories, common modules

## 🌐 Web Servers & Load Balancing

6. **Deploying Web Apps with Nginx**

   ○ **Requirements:** Linux, Nginx, sample HTML app

   ○ **Covers:** Reverse proxying, load balancing, SSL setup

7. **Apache vs Nginx: Choosing the Right Web Server**

   ○ **Requirements:** Both servers installed

   ○ **Covers:** Benchmarks, config syntax comparison, use cases

8. **HAProxy for High Availability**

   ○ **Requirements:** Linux VMs or containers, HAProxy

○ **Covers:** Load balancing algorithms, health checks

9. **HTTPS the Easy Way: Caddy Web Server**

   ○ **Requirements:** Caddy installed

   ○ **Covers:** Automatic TLS, config simplicity, static hosting

10. **Hosting Multiple Sites with Virtual Hosts in Apache**

    ○ **Requirements:** Apache, multiple domain configs

    ○ **Covers:** VirtualHost blocks, DNS simulation via `/etc/hosts`

## ⚙️ System Administration & Monitoring

11. **Scheduling Tasks with Cron and systemd timers**

    ○ **Requirements:** Linux cron and systemd familiarity

    ○ **Covers:** `crontab`, timer units, automation examples

12. **htop, atop, and Beyond: System Monitoring Tools**

    ○ **Requirements:** CLI tools installed

    ○ **Covers:** CPU/memory usage, live monitoring, log basics

13. **Log Management and Rotation with logrotate**

    ○ **Requirements:** Access to `/var/log`, logrotate installed

    ○ **Covers:** Configuration files, retention policy, manual rotation

14. **Netdata for Real-Time Linux Monitoring**

    ○ **Requirements:** Netdata installed

    ○ **Covers:** Dashboards, alerting, common metrics

15. **Monitoring Infrastructure with ELK Stack (Elasticsearch, Logstash, Kibana)**

    ● **Focus**: Centralized logging and visualization

    ● **Requirements**:

        ○ Explain components: Elasticsearch (store), Logstash (pipeline), Kibana (UI)

        ○ Demonstrate log collection (e.g., Nginx logs)

        ○ Provide a sample dashboard

16. **Zabbix: Comprehensive Infrastructure Monitoring**

- **Focus**: Agent-based and agentless monitoring

- **Requirements**:

    - Install Zabbix server and agent

    - Configure alerts and thresholds

    - Show graph or report for a Linux host

## 🔐 Security & Access Control

17. **Encrypting Files and Emails with GPG**

    - **Requirements:** GPG installed

    - **Covers:** Key generation, signing, encryption/decryption

18. **Managing Linux Firewalls with firewalld**

    - **Focus:** Dynamic firewall management with zones, services, and ports

    - **Requirements:**

        - Install and enable firewalld service

        - Show zone concepts and assign interfaces

        - Add/remove services and open/close ports

        - Explain runtime vs permanent changes and reload firewall

        - Display active firewall rules

        - Demonstrate restricting SSH by IP and enabling HTTP access

## 💻 Developer & System Tools

19. **Git Basics for Linux Users**

    - **Requirements:** Git installed

    - **Covers:** Git init, commit, branch, merge, conflict resolution

20. **Vagrant for Lightweight VM Automation**

    - **Requirements:** VirtualBox or provider, Vagrant

    - **Covers:** Vagrantfile, provisioning, boxes, multi-machine setups

21. **Managing Software with APT, DNF, and Snap**

    - **Requirements:** Debian and RedHat-based VMs

    - **Covers:** Package search/install/remove, repositories, Snap