

Week 1 – Core Infra Foundations & Cloud-Native Deep Dive

Weekly Flow

- **Mon–Fri:** Deep dives + hands-on exercises
 - **Saturday:** Live Production Outage Simulation based on this week's learning
 - **Sunday:** Live Project Walkthrough with real-world infra examples
 - **Bi-Weekly:** Live client call on **AWS Cost Optimisation Project**
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Day-Wise Breakdown

Monday – OS Internals & Boot Process Mastery

- Linux OS architecture & kernel space vs user space
- Boot process stages (BIOS/UEFI, GRUB, init/systemd)
- Filesystem hierarchy & mount points
- systemd, runlevels & target units
- Troubleshooting boot issues (initramfs, kernel panics)

Hands-On:

- Inspect boot logs with `journalctl -b`
 - Change default boot target & recover
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Tuesday – Linux Networking & Traffic Control

- Linux networking stack & packet flow
- DNS resolution process (resolv.conf, nsswitch)
- Firewall management (iptables / nftables)
- Routing tables & traceroute analysis
- Debugging DNS, latency & connectivity

Hands-On:

- Capture packets with tcpdump
- Simulate DNS failure & fix
- Restrict/allow traffic with custom iptables rules

Wednesday – Secure Access & User Management

- SSH deep dive (protocol, ciphers, key exchange)
- Key-based authentication & hardening
- PAM (Pluggable Authentication Modules) for custom auth flows
- sudoers file advanced configurations
- Detecting & locking compromised accounts

Hands-On:

- Configure key-based SSH for multiple users
 - Restrict sudo to specific commands
 - Implement PAM-based login banner & 2FA
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Thursday – Cloud-Native Fundamentals

- Containers 101: Namespaces, cgroups, overlay FS
- Orchestration concepts & scheduling basics
- IaC (Infrastructure as Code) mindset
- Docker → Kubernetes transition path

Hands-On:

- Create a minimal container from scratch (no Dockerfile)
 - Simulate container resource starvation
 - Deploy a container orchestration setup (local kind/minikube)
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Friday – Terraform + Ansible Basics in an Enterprise Setting

- Terraform providers, resources & state management
- Ansible inventory, playbooks, roles
- How Terraform & Ansible complement each other in workflows
- State locking & drift detection in Terraform

Hands-On:

- Write a Terraform config to deploy VM + storage
 - Use Ansible to configure deployed VMs
 - Detect & fix drift in Terraform-managed infra
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Saturday – Production Outage Simulation

Scenario: **Critical OS-level misconfiguration leading to network isolation**

- Diagnose under pressure
 - Document RCA & recovery steps
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Sunday – Live Project Walkthrough

Case Study: **InfraSec Audit & Remediation**

- Architectural Review
- Security Hardening
- Terraform Audit
- CI/CD Pipeline Scan
- Dockerfile Best Practices
- Observability Blind Spot Analysis

A replica of what consultants do inside large tech firms.

Deliverables by the End of Week 1

- Mastery of Linux OS internals & boot recovery
 - Confident in diagnosing networking & DNS issues
 - Ability to secure SSH & manage users at scale
 - Comfort with container fundamentals
 - Working knowledge of Terraform + Ansible in a real workflow
 - Completed RCA for Saturday's outage
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