

# Ubuntu Administration Foundations

## Linux operations, SSH, networking, containers and Nginx

FA-0703 · 4 days

DevOps, Cloud & Infrastructure

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### Introduction

This four-day beginner course develops practical Ubuntu administration skills in a prepared virtual-machine or server lab. It progresses from terminal operations and packages to users, networking, SSH, shell automation, Docker and Nginx.

Participants complete selected exercises and a bounded web-service project. Monitoring, troubleshooting and recovery are introduced as repeatable operational practices; the course does not claim to turn beginners into fully proficient production administrators.

### Learning outcomes

- Navigate the filesystem and perform common command-line file operations.
- Manage packages, users, groups and selected permissions.
- Configure and troubleshoot representative networking, SSH and firewall settings.
- Write a small shell script and explain scheduled-task operation.
- Run a simple Docker application and evaluate port exposure.
- Configure a small Nginx site or reverse proxy and explain TLS prerequisites.
- Inspect logs and resource usage and document selected troubleshooting/recovery procedures.

### Prerequisites

- Basic computer skills; prior CLI and networking exposure are helpful but not required.

- Prepared Ubuntu lab access, an SSH-capable terminal and a suitable editor such as VS Code.
- Network access to required repositories and lab services, rather than unrestricted Internet access.
- Windows users may use a suitable VM or WSL2 for selected exercises; differences from a full server environment are explained.

# Training outline

## 1. Day 1 — Ubuntu, terminal and packages

- History and Philosophy of Linux
- Ubuntu Distribution: Overview and Features
- Install in a prepared virtual machine; compare dual-boot and server deployment considerations
- Navigating the Ubuntu Desktop and Terminal

## Command-line operations

- Basic commands: ls, cd, cp, mv, mkdir, rm and nano/vim, with attention to reversible practice and scope
- Filesystem Hierarchy and Path Navigation
- File and Directory Operations
- Selected command-line utilities, help and pipelines

## Software management

- Understanding Repositories
- Use apt interactively and appropriate apt-get commands in automation
- Managing Software Dependencies and System Updates
- Repository trust, package signing and supported third-party source configuration

## 2. Day 2 — Users, networking and SSH

- Creating and Managing User Accounts
- Understanding File Permissions and Ownership
- Groups and Access Control Lists (ACLs)
- Implementing Best Practices for System Security

# Network configuration and firewall

- Current network tools: ip, ss, ping and suitable route/DNS diagnostics; recognise legacy ifconfig/netstat
- IP and DNS configuration with Netplan and the environment's selected network renderer
- Introduction to UFW (Uncomplicated Firewall)
- Securing Ubuntu with Firewall Rules

## Remote access

- SSH Basics: Securely Connecting to Remote Systems
- Generating and Managing SSH Keys
- SSH Configurations and Troubleshooting
- SSH Tunnels and Port Forwarding

## 3. Day 3 – Automation, Docker and Nginx

- Basics of Shell Scripting
- Writing Your First Shell Script
- Scripting for Automation: Backup Scripts and Cron Jobs
- Best Practices in Shell Scripting

## Container fundamentals

- Introduction to Containers and Docker
- Installing Docker on Ubuntu
- Managing Docker Images and Containers
- Deploying a Simple Application in Docker

Docker-published ports interact with host firewall processing; verify exposure rather than assuming UFW alone controls it.

## Web service

- Web Server Basics: HTTP Protocol and Web Hosting
- Installing and Configuring Nginx on Ubuntu
- Setting Up a Simple Website with Nginx
- TLS concepts and a Let's Encrypt demonstration where domain validation and lab access permit

## 4. Day 4 – Monitoring, troubleshooting and project

- Monitoring Tools (top, htop, vmstat)
- Analyzing System Logs for Troubleshooting
- Performance Tuning and Resource Management
- Disk usage with df/du; inspect partition information without modifying non-lab disks

## Recovery and hardening awareness

- Kernel and System Updates
- Recovering from Boot and System Failures
- Networking Troubleshooting Techniques
- Security Best Practices and System Hardening

## Guided web-service project

- Reviewing and Applying Course Knowledge
- Deploying a Web Application using Docker and Nginx
- Implementing Security Measures and Optimizations
- Documentation and Best Practices for Maintenance