

Introduction to Linux Networking

A Practical Guide To Mastering Linux Networking

Master Linux networking from the ground up. This book is a practical, systems-first guide that equips you with the tools and expertise to design, build, and operate Linux-first network infrastructure with confidence. You will learn both the underlying principles and the hands-on implementations that make robust, scalable networks possible.

The book begins by establishing strong mental models: the OSI and TCP/IP stacks; IPv4/IPv6 addressing, subnetting, and CIDR; and the core protocols that underpin them (TCP, UDP, ICMP, and ARP). It then maps these concepts to Linux primitives—kernel networking, netdevices, network namespaces, netfilter, and conntrack—before moving into host-level implementations and foundational network services. Troubleshooting and observability are treated as first-class skills, with a practical toolkit centered on tcpdump, tshark, ip, ss, mtr, netcat (nc), and nmap.

Security and routing form the heart of the book's advanced material. The chapters cover host firewalls in depth, starting with iptables and progressing to modern, production-grade nftables. You will learn advanced routing techniques—policy-based routing (PBR) and Virtual Routing and Forwarding (VRF)—that turn a Linux host into a production-ready router.

The book then turns to dynamic routing, showing how Linux runs OSPF and BGP and participates in Internet-scale routing through the open-source FRR suite. Operational concerns in large networks are addressed with protocols and patterns such as BFD, ECMP, and VRRP. Finally, you will learn to secure connectivity, from VPN fundamentals to end-to-end guides for IPsec (strongSwan/Libreswan), OpenVPN, and WireGuard. By the end, you will have a deep understanding of Linux networking internals and the practical skills to architect, harden, and operate complex networks across cloud, on-premises, and edge environments.

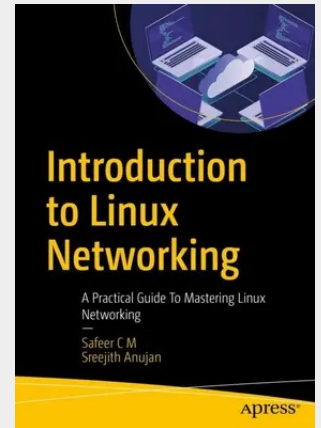
What You Will Learn

- Understand the core design principles that modern, cloud-native networks are built on
- Convert Linux hosts into production-grade routers using the kernel's routing subsystem, policy routing, and VRFs
- Diagnose tricky real-world behavior, including asymmetric routing, reverse path filtering, and connection tracking
- Connect sites, remote users, and data centers with VPN solutions such as IPsec and WireGuard

Who This Book is For

Cloud Engineers, Infrastructure Architects, Platform Engineers and Architects, Data Center Architects, Network Engineers and Architects

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64,19 €

59,99 € (zzgl. MwSt.)

vorbestellbar, Erscheinungstermin ca.
Dezember 2026

Artikelnummer: 9798868831409

Medium: Buch

ISBN: 979-8-8688-3140-9

Verlag: APRESS L.P.

Erscheinungstermin: 24.12.2026

Sprache(n): Englisch

Auflage: 1. Auflage 2026

Produktform: Kartoniert

Format (B x H): 178 x 254 mm

