

# Computer Networking

A Top-Down Approach Featuring the Internet

James F. Kurose and Keith W. Ross

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## Table of Contents

### Preface

### Chapter 1: Computer Networks and the Internet

[1.1: What Is the Internet?](#)

[1.2: What Is a Protocol?](#)

[1.3: The Network Edge](#)

[1.4: The Network Core](#)

[1.5: Access Networks and Physical Media](#)

[1.6: Delay and Loss in Packet-Switched Networks](#)

[1.7: Protocol Layers and Their Service Models](#)

[1.8: Internet Backbones, NAPs, and ISPs](#)

[1.9: A Brief History of Computer Networking and the Internet](#)

[1.10: Summary](#)

[Interview](#)

[References](#)

### Chapter 2: Application Layer

- [2.1: Principles of Application Layer Protocols](#)
- [2.2: The World Wide Web: HTTP](#)
- [2.3: File Transfer: FTP](#)
- [2.4: Electronic Mail in the Internet](#)
- [2.5: DNS--The Internet's Directory Service](#)
- [2.6: Socket Programming with TCP](#)
- [2.7: Socket Programming with UDP](#)
- [2.8: Building a Simple Web Server](#)
- [2.9: Summary](#)

[Interview](#)

[References](#)

[Lab 1: Building a Multi-Threaded Web Server](#)

[Lab 2: A Mail User Agent in Java](#)

## **Chapter 3: Transport Layer**

- [3.1: Transport-Layer Services and Principles](#)
- [3.2: Multiplexing and Demultiplexing Applications](#)
- [3.3: Connectionless Transport: UDP](#)
- [3.4: Principles of Reliable Data Transfer](#)
- [3.5: Connection-Oriented Transport: TCP](#)
- [3.6: Principles of Congestion Control](#)
- [3.7: TCP Congestion Control](#)
- [3.8: Summary](#)

[Interview](#)

[References](#)

[Lab 3: Implementing a Reliable Transport Protocol](#)

## **Chapter 4: Network Layer and Routing**

- [4.1: Introduction and Network Service Models](#)
- [4.2: Routing Principles](#)
- [4.3: Hierarchical Routing](#)
- [4.4: Internet Protocol](#)
- [4.5: Routing in the Internet](#)

[4.6: What's inside a Router?](#)

[4.7: IPv6](#)

[4.8: Multicast Routing](#)

[4.9: Summary](#)

[Interview](#)

[References](#)

[Lab 4: Implementing an Algorithm](#)

## **Chapter 5: Link Layer and Local Area Networks**

[5.1: The Data Link Layer: Introduction, Services](#)

[5.2: Error Detection and Correction Techniques](#)

[5.3: Multiple Access Protocols and LANs](#)

[5.4: LAN Addresses and ARP](#)

[5.5: Ethernet](#)

[5.6: Hubs, Bridges, and Switches](#)

[5.7: IEEE 802.11 LANs](#)

[5.8: PPP: The Point-to-Point Protocol](#)

[5.9: Asynchronous Transfer Mode \(ATM\)](#)

[5.10: X.25 and Frame Relay](#)

[5.11: Summary](#)

[Interview](#)

[References](#)

## **Chapter 6: Multimedia Networking**

[6.1: Multimedia Networking Applications](#)

[6.2: Streaming Stored Audio and Video](#)

[6.3: Making the Best of the Best-Effort Service: An Internet Phone Example](#)

[6.4: RTP](#)

[6.5: Beyond Best-Effort](#)

[6.6: Scheduling and Policing Mechanisms](#)

[6.7: Integrated Services](#)

[6.8: RSVP](#)

[6.9: Differentiated Services](#)

[6.10: Summary](#)

[Interview](#)

[References](#)

## **Chapter 7: Security in Computer Networks**

[7.1: What is Network Security?](#)

[7.2: Principles of Cryptography](#)

[7.3: Authentication: Who are You?](#)

[7.4: Integrity](#)

[7.5: Key Distribution and Certification](#)

[7.6: Secure E-Mail](#)

[7.7: Internet Commerce](#)

[7.8: Network Layer Security: IPsec](#)

[7.9: Summary](#)

[Interview](#)

[References](#)

## **Chapter 8: Network Management**

[8.1: What is Network Management?](#)

[8.2: The Infrastructure for Network Management](#)

[8.3: The Internet Network-Management Framework](#)

[8.4: ASN.1](#)

[8.5: Firewalls](#)

[8.6: Summary](#)

[Interview](#)

[References](#)

**Back to Top**

# Introduction

## Chapter 1: Computer Networks and the Internet

This chapter provides a broad overview of computer networking and the Internet. The chapter serves as an introductory chapter to the rest of this book. But it can also serve as the foundation for a short course on computer networking. We begin the chapter with an overview of the Internet and of networking protocols, introducing several key terms and concepts. We examine the "edge" of a computer network, looking at the end systems and applications, and at the transport service provided to applications running on the end systems. We also examine the "core" of a computer network, examining the links and switches that transport data. We then take a broader view of networking. From a performance standpoint, we study the causes of packet delay and loss in a computer network. We identify key architectural principles in networking, including layering and service models. We provide a brief introduction history of computer networking. Finally, we provide a brief overview of ATM, a networking technology that provides an important contrast with the Internet technologies.

# About the Book

## **Networking from a New Perspective**

*Computer Networking: A Top-Down Approach Featuring the Internet* provides a new perspective to the study of computer networking concepts--a modern, top-down approach that starts with application-level protocols and then works down the protocol stack. Throughout the book, examples drawn from the Internet architecture show how networking principles are put into practice.

## **Integrating Principles and Practice**

Networking is much more (and much more interesting!) than dry standards specifying message formats and protocol behaviors. Professors Kurose and Ross focus on describing the emerging principles of the field and then illustrate these principles with examples drawn from the Internet architecture. The discussion is lively, engaging, and up to date.

## **A Top-Down Organization with Early Emphasis on Applications**

This book starts with an early discussion of application-level protocols, allowing readers to gain an intuitive feel for network protocols. The focus on application-layer paradigms and application programming interfaces allows readers to get their "hands dirty" early--studying and implementing protocols in the context of applications they use daily. Proceeding through the layered network architecture in a top-down manner, readers can focus on the network services that are needed and then, in turn, study how these services can be provided.

## **Comprehensive Companion Website**

This book features a continually updated website to enhance teaching and learning. This site includes material for students and instructors, including the full text with an advanced searching feature and a hyper-linked index, Java applets to help demonstrate difficult concepts, links to up-to-date material, and complete supplements for instructors.