



# PART I

## *Overview of Data Communications and Networking*

# Overview

## Network models

### Protocols and standards

#### Data communications

Components

Data representation

Data Flow

#### Networking

Internet

LANs and WANs

Distribution processing

Criteria

Structure



# Chapters

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*Chapter 1 Introduction*

*Chapter 2 Network Models*

# Chapter 1

# *Introduction*

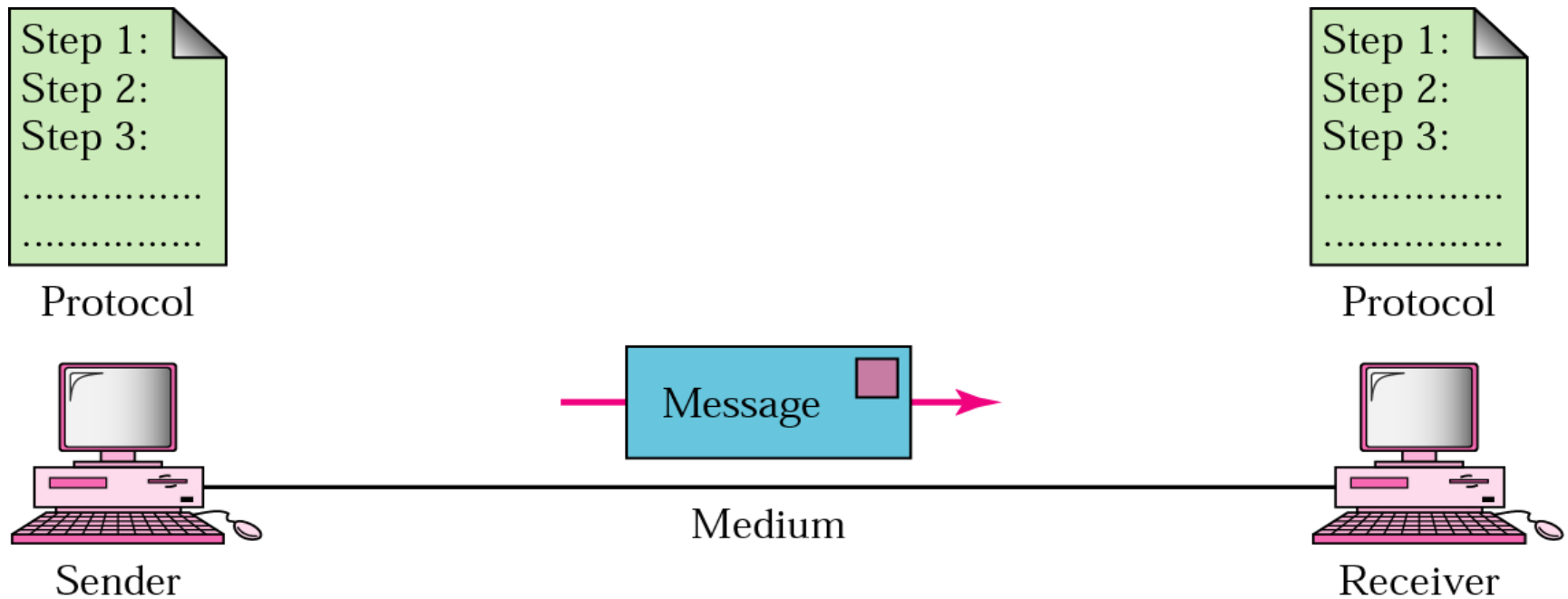
# 1.1 Data Communication

Components

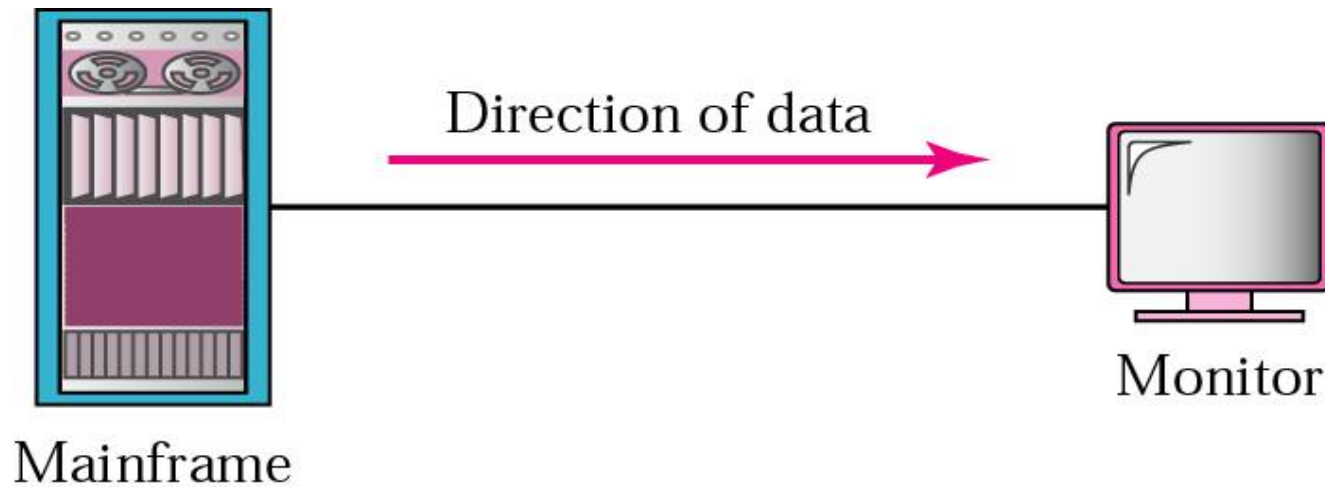
Data Representation

Direction of Data Flow

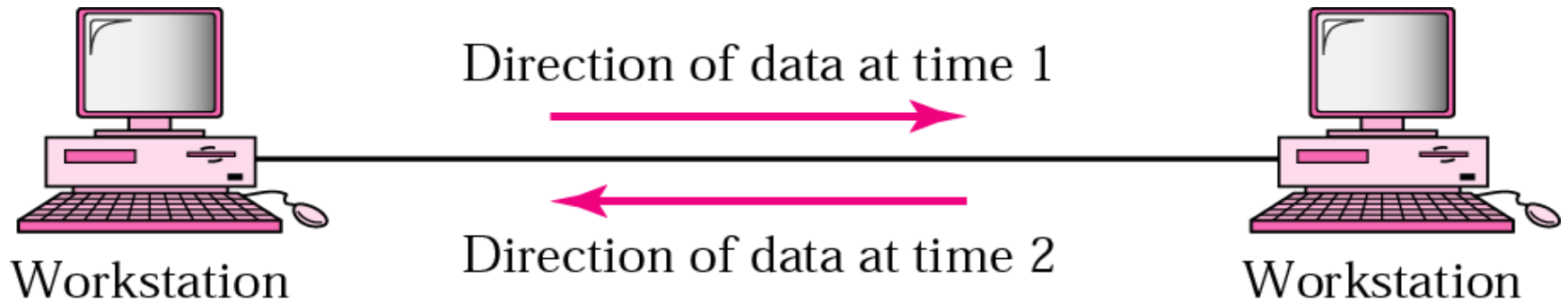
**Figure 1.1** *Five components of data communication*



**Figure 1.2** *Simplex*

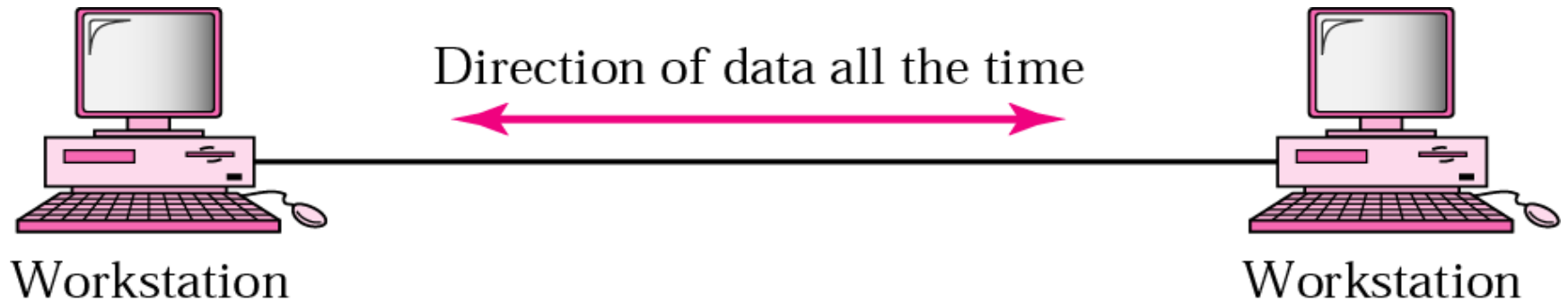


**Figure 1.3** *Half-duplex*





**Figure 1.4** *Full-duplex*



## 1.2 Networks

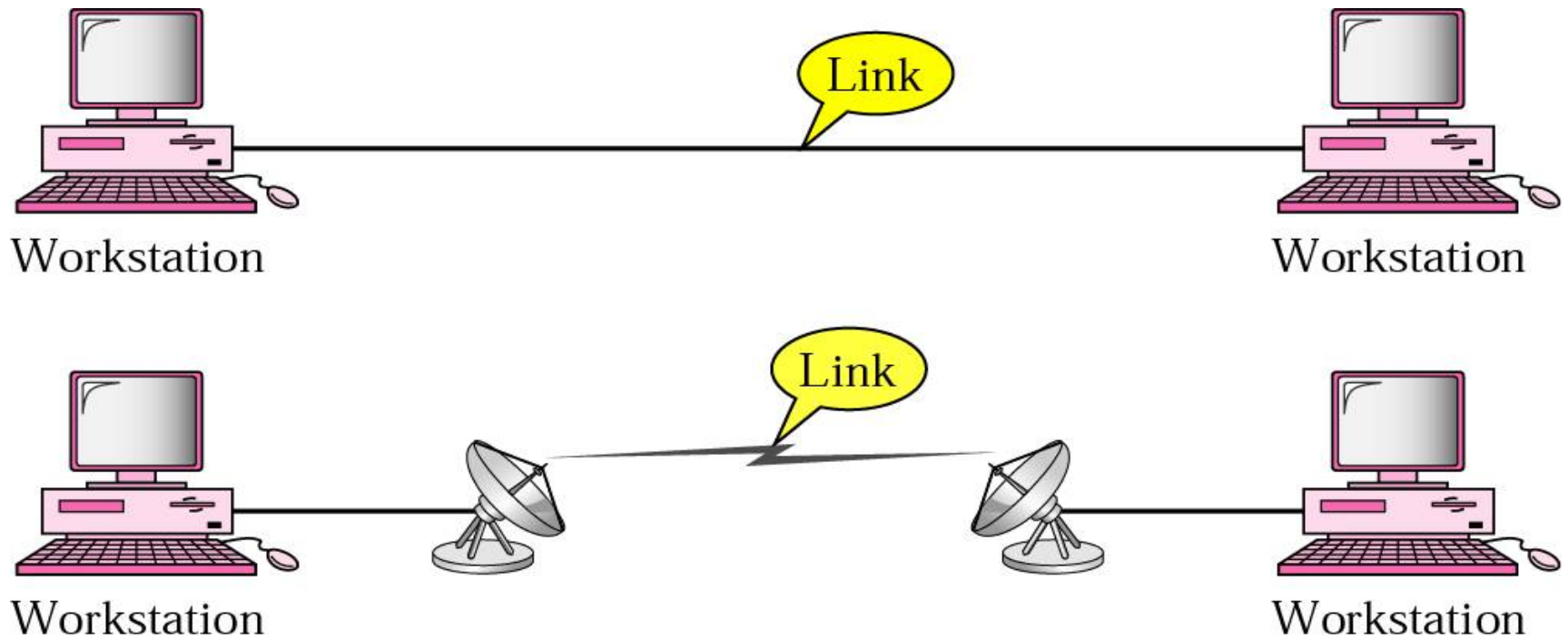
Distributed Processing

Network Criteria

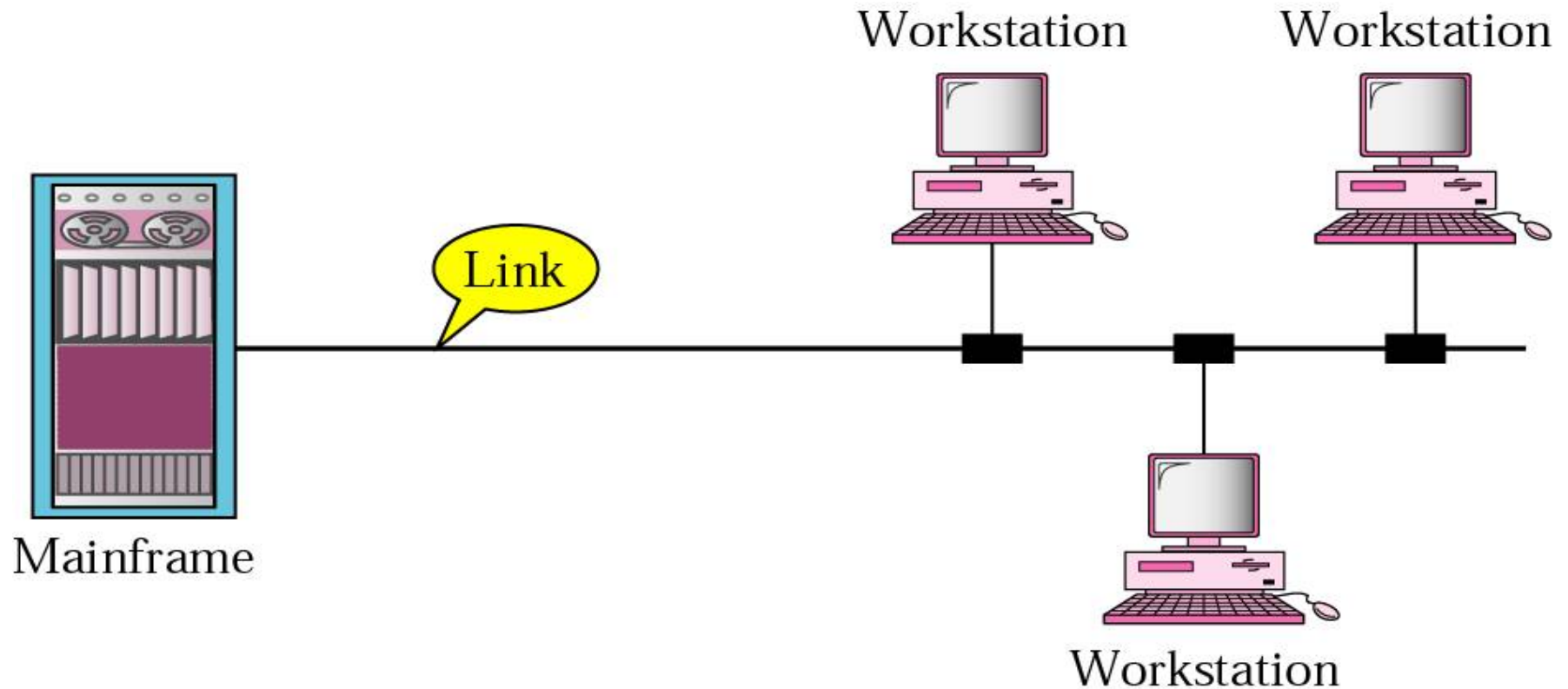
Physical Structures

Categories of  
Networks

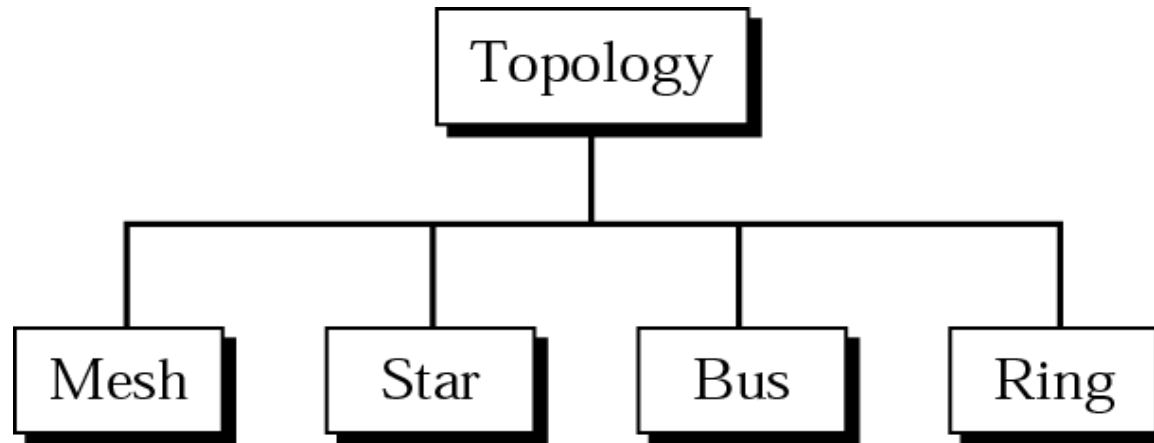
**Figure 1.5** *Point-to-point connection*



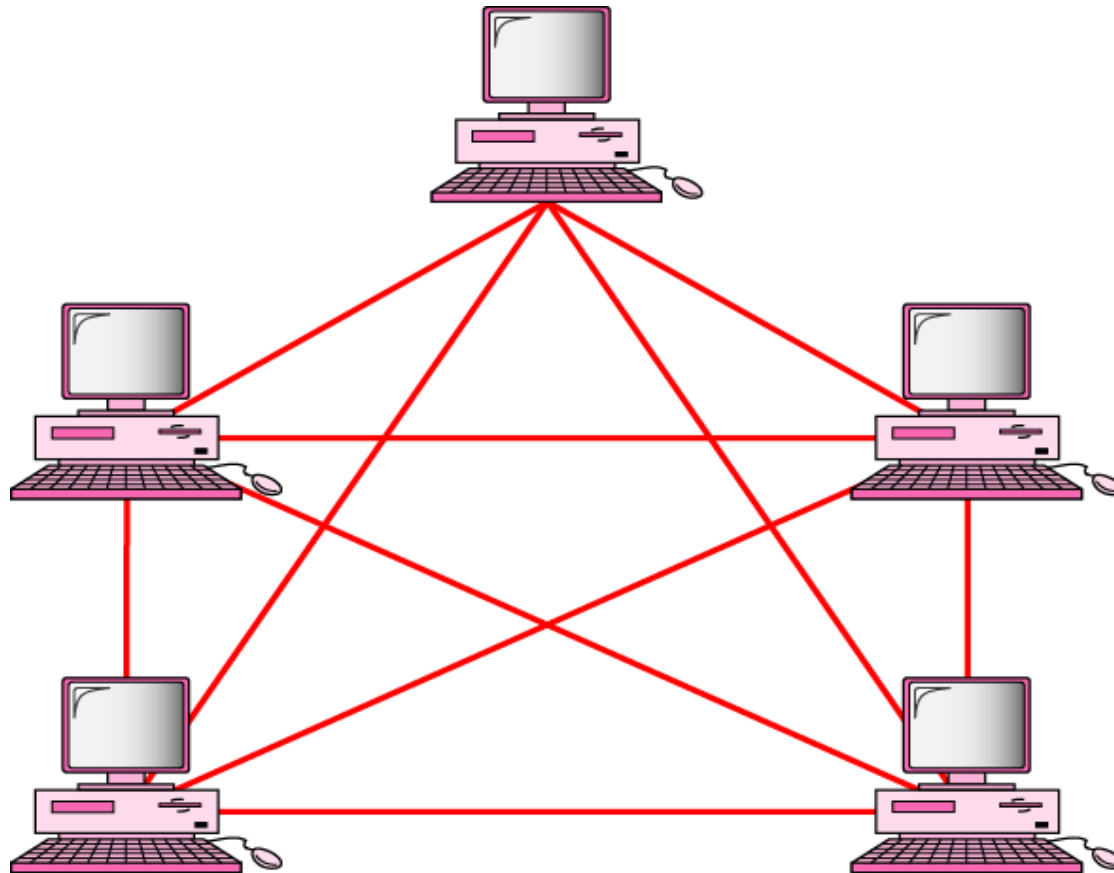
**Figure 1.6** *Multipoint connection*



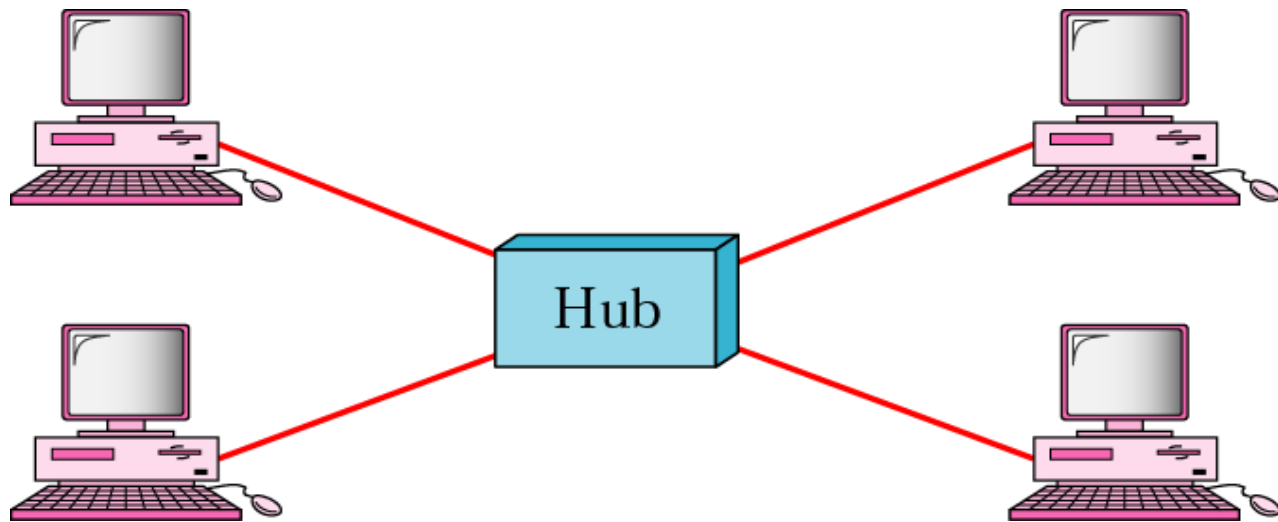
**Figure 1.7** *Categories of topology*



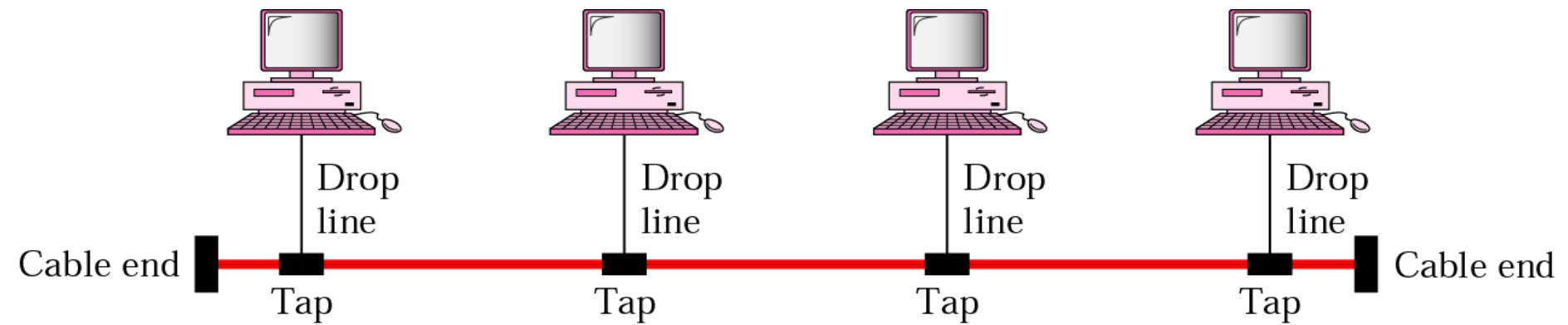
**Figure 1.8** *Fully connected mesh topology (for five devices)*



**Figure 1.9** *Star topology*

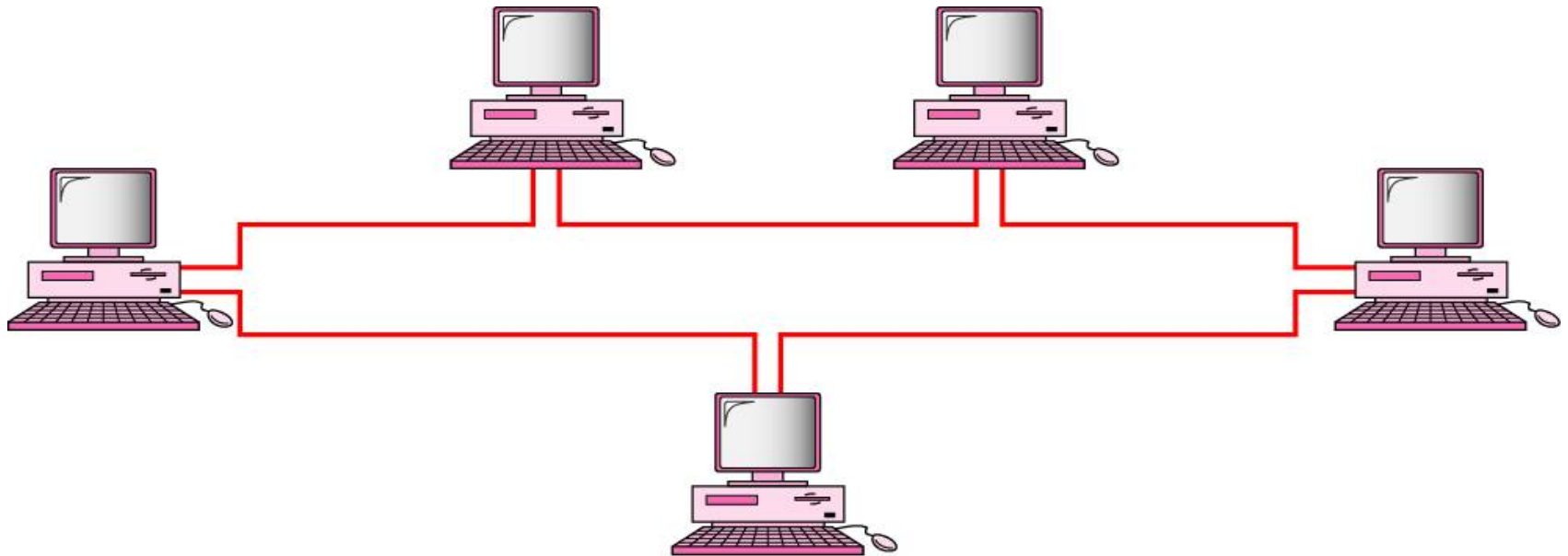


**Figure 1.10** *Bus topology*

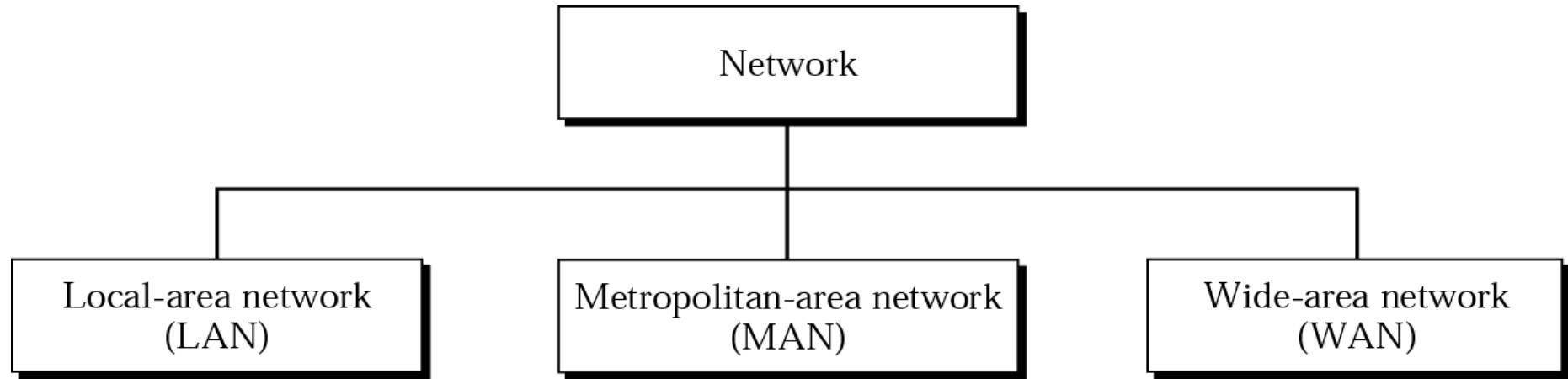


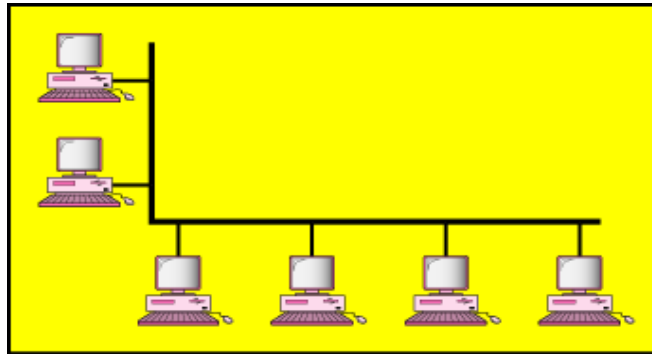


**Figure 1.11** *Ring topology*



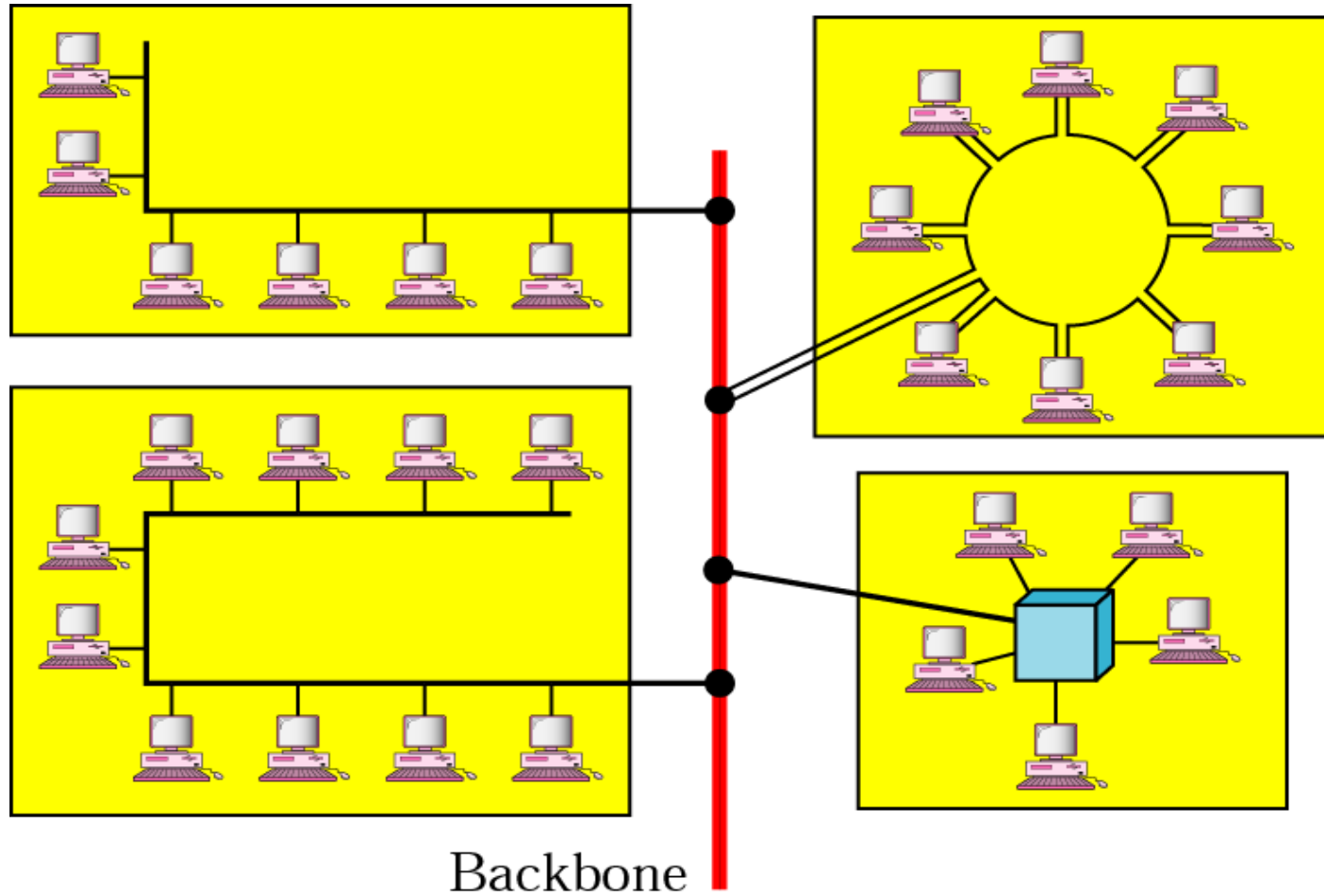
**Figure 1.12** *Categories of networks*





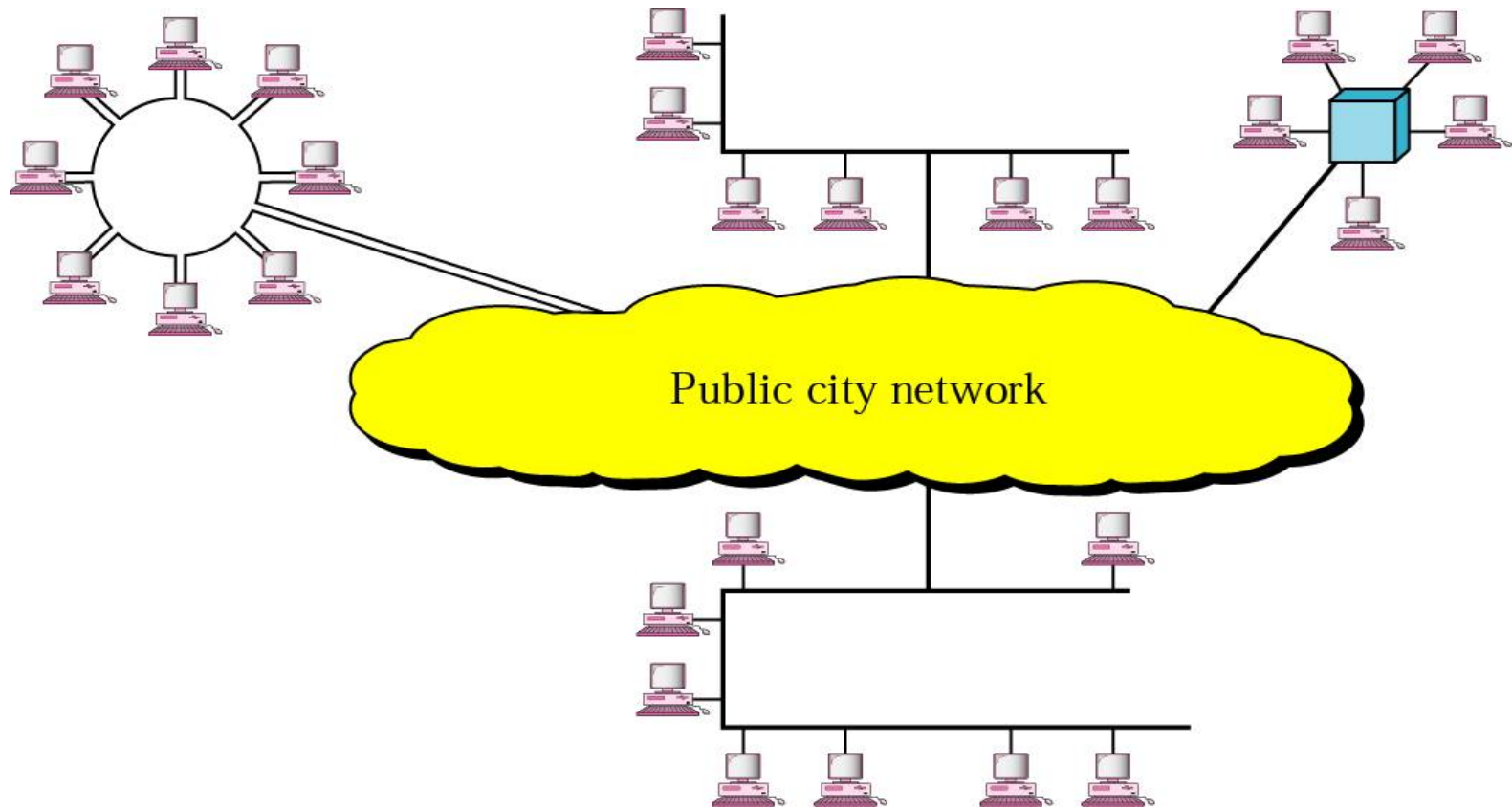
a. Single-building LAN

**Figure 1.13** *LAN (Continued)*

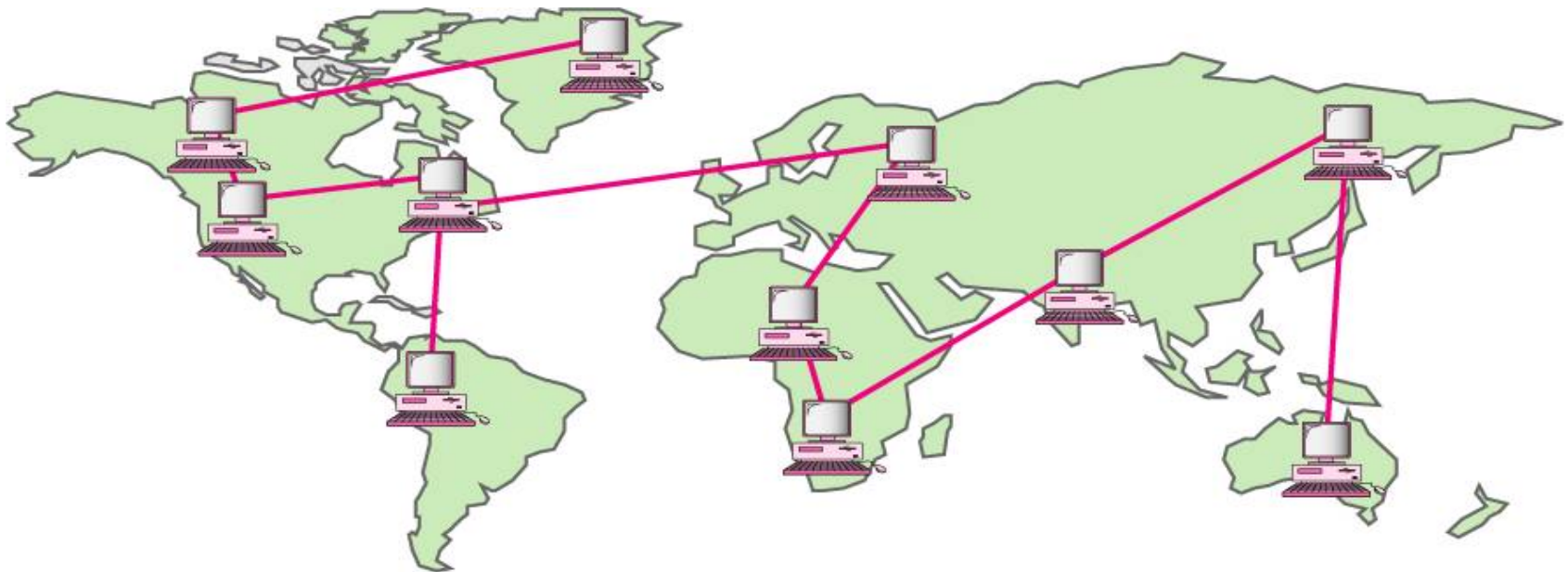


b. Multiple-building LAN

**Figure 1.14** *MAN*



**Figure 1.15** WAN

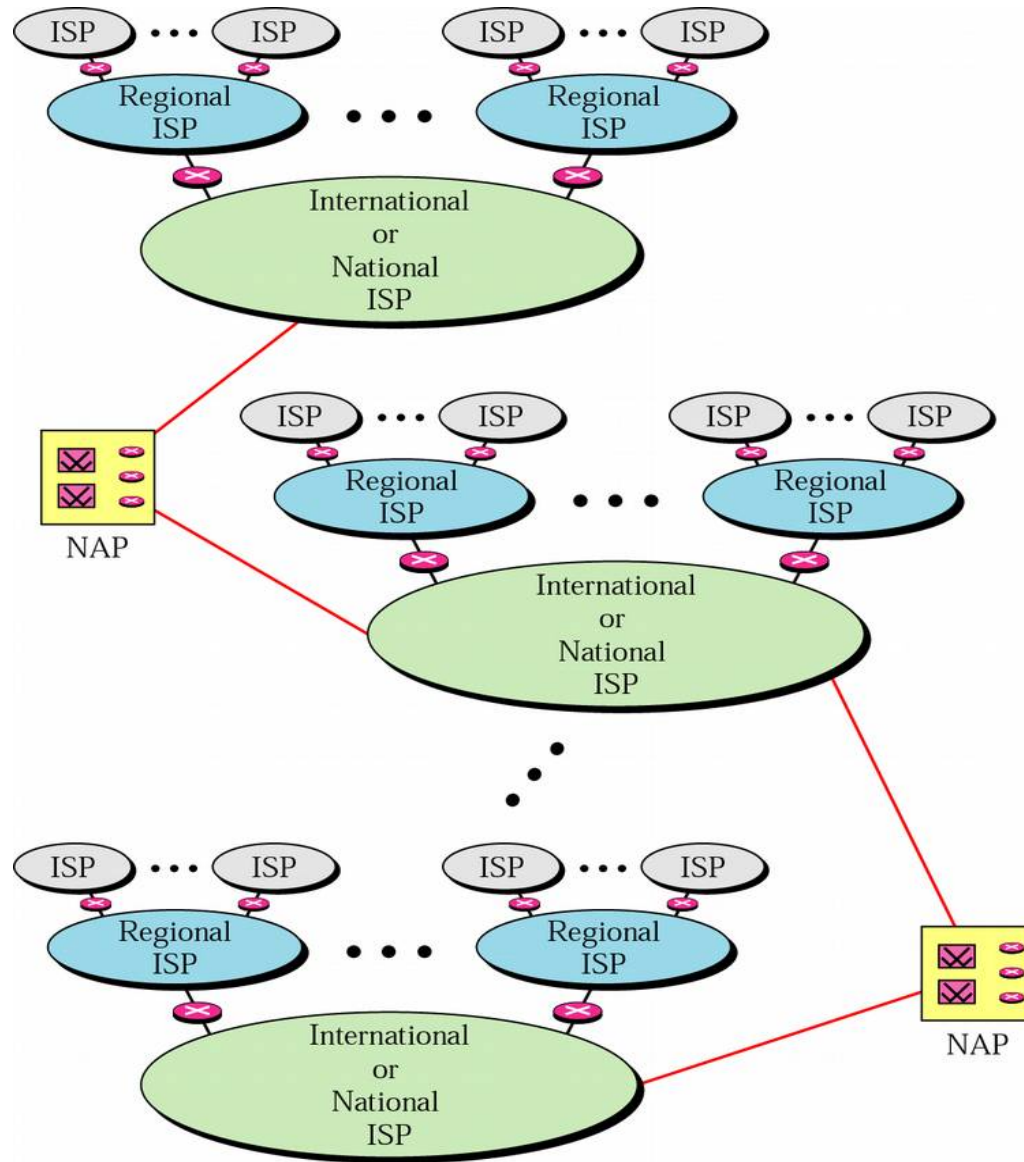


# 1.3 The Internet

A Brief History

The Internet Today

**Figure 1.16** *Internet today*





# 1.4 Protocols and Standards

Protocols

Standards

Standards Organizations

Internet Standards