

THOMSON
COURSE TECHNOLOGY

**Network+ Guide to Networks,
Fourth Edition**

Chapter 1
An Introduction to Networking

Objectives

- List the advantages of networked computing relative to standalone computing
- Distinguish between client/server and peer-to-peer networks
- List elements common to all client/server networks
- Describe several specific uses for a network

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Objectives (continued)

- Identify some of the certifications available to networking professionals
- Identify the kinds of nontechnical, or “soft,” skills that will help you succeed as a networking professional

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Why Use Networks?

- Network: group of computers and other devices that are connected by some type of transmission media
- Advantages of using networks over standalone computers:
 - Networks enable multiple users to share the network’s resources (devices and data)
 - Networks allow you to manage, or administer, resources on multiple computers from a central location

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Types of Networks: Peer-to-peer Networks

- Every computer can communicate directly with every other computer
- By default, no computer has more authority than another
- Every computer is capable of sending and receiving information to and from every other computer

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Peer-to-peer Networks (continued)

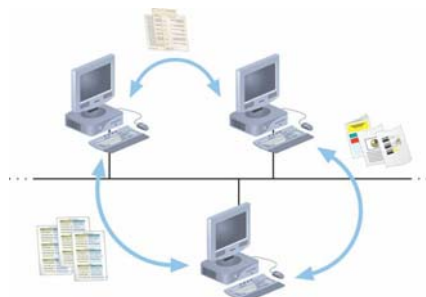


Figure 1-1: Resource sharing on a simple peer-to-peer network

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Client/Server Networks

- Server: central computer used to facilitate communication and resource sharing between other computers on the network (called clients)
- Client/server network: uses a server to enable clients to share data, data storage space, and devices
- To function as a server, a computer must be running a network operating system (NOS)
- Most of the concepts on the Network+ exam pertain to client/server networks

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Client/Server Networks (continued)

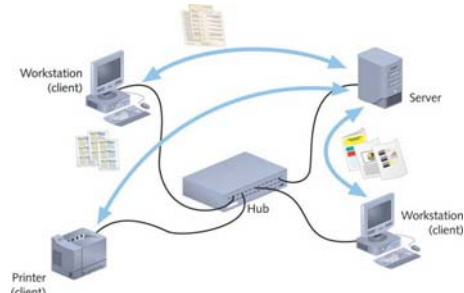


Figure 1-2: Resource sharing on a client/server network

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Client/Server Networks (continued)

- Advantages of using client/server networks over peer-to-peer networks:
 - User logon accounts and passwords can be assigned in one place
 - Access to multiple shared resources can be centrally granted to a single user or groups of users
 - Problems can be tracked, diagnosed, and often fixed from one location

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Client/Server Networks (continued)

- Advantages of using client/server networks over peer-to-peer networks (continued):
 - Servers are optimized to handle heavy processing loads and dedicated to handling requests from clients, enabling faster response time
 - Because of their efficient processing and larger disk storage, servers can connect more than a handful of computers on a network

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LANs, MANs, and WANs

- Local area network (LAN): confined to a relatively small space, such as a building or an office
- Metropolitan area network (MAN): larger than a LAN; connects clients and servers from multiple buildings
- Wide area network (WAN): connects two or more geographically distinct LANs or MANs

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LANs, MANs, and WANs (continued)

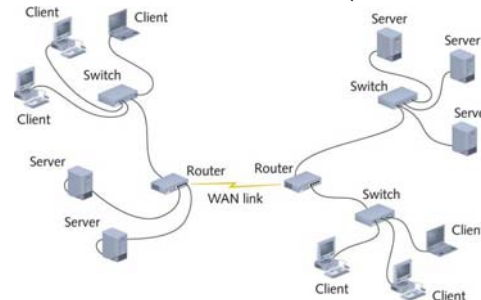


Figure 1-4: A simple WAN

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Elements Common to Client/Server Networks

- Client
- Server
- Workstation
- Network interface card (NIC)
- NOS
- Host
- Node
- Connectivity device

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Elements Common to Client/Server Networks (continued)



Figure 1-5: A NIC

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Elements Common to Client/Server Networks (continued)

- Segment
- Backbone
- Topology
- Protocol
- Data packets
- Addressing
- Transmission media

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Elements Common to Client/Server Networks (continued)

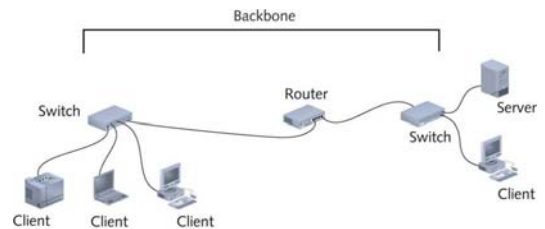


Figure 1-6: A LAN backbone

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Elements Common to Client/Server Networks (continued)

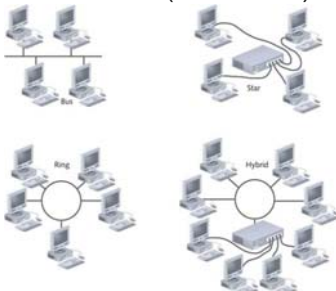


Figure 1-7: Common network topologies
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Elements Common to Client/Server Networks (continued)

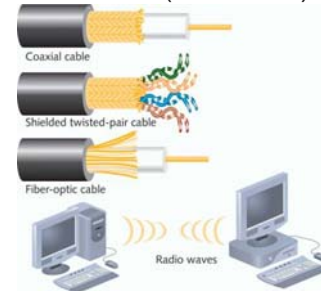


Figure 1-8: Examples of network transmission media
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How Networks Are Used

- Network services: functions provided by a network
- File services
 - Capability of a server to share data files, applications, and disk storage space
 - File server
- Print services: used to share printers across a network

How Networks Are Used (continued)

- Communications services
 - Allow remote users to connect to the network
 - Remote access server (also known as communications server or access server)
- Mail services
 - Coordinate the storage and transfer of e-mail between users on a network
 - Mail server

How Networks Are Used (continued)

- Internet services
 - Supplying Web pages, file transfer capabilities, Internet addressing schemes, security filters, and a means for directly logging on to other computers on the Internet
 - Web server
- Management services: centrally administer management tasks on the network
 - Traffic monitoring and control
 - Load balancing

How Networks Are Used (continued)

- Management services (continued)
 - Hardware diagnosis and failure alert
 - Asset management
 - License tracking
 - Security auditing
 - Software distribution
 - Address management
 - Backup and restoration of data

Becoming a Networking Professional: Mastering the Technical Challenges

- Installing, configuring, and troubleshooting network server software and hardware
- Installing, configuring, and troubleshooting network client software and hardware
- Understanding the characteristics of different transmission media
- Understanding network design

Mastering the Technical Challenges (continued)

- Understanding network protocols
- Understanding how users interact with the network
- Constructing a network with clients, servers, media, and connectivity devices

Developing Your “Soft Skills”

- Soft skills: skills that are not easily measurable, such as:
 - Customer relations
 - Oral and written communications
 - Dependability
 - Teamwork
 - Leadership abilities

Pursuing Certification

- Certification: process of mastering material pertaining to a particular hardware system, operating system (OS), programming language, or other software application, and then proving your mastery by passing a series of exams
- A+
- Microsoft Certified Systems Engineer (MCSE)
- Certified NetWare Engineer (CNE)
- Network+ (Net+)

Finding a Job in Networking

- Search the Web
- Read the newspaper
- Visit a career center
- Network
- Attend career fairs
- Enlist a recruiter

Joining Professional Associations

- Benefits of joining a professional organization
- Professional organizations in the field of networking
- Professional associations that cater to specific demographic groups

Joining Professional Associations (continued)

Professional Organization	Web Site
Association for Computing Machinery (ACM)	www.acm.org
Association for Information Technology Professionals	www.aftp.org
Chinese Information and Networking Association	www.cina.org
IEEE Computer Society	www.computer.org
Women in Technology International (WITI)	www.witi.org

Table 1-1: Networking organizations

Summary

- A network is a group of computers and other devices that are connected by some type of transmission media
- In a peer-to-peer network, every computer can communicate directly with every other computer
- A client/server network uses a server to enable clients to share data, data storage space, and devices
- A LAN is confined to a relatively small space, such as a building or office

Summary (continued)

- A MAN is larger than a LAN and connects clients and servers from multiple buildings
- A WAN connects two or more geographically distinct LANs or MANs
- Elements common to client/server networks: client, server, workstation, NIC, NOS, host, node, connectivity device, segment, backbone, topology, protocol, data packets, addressing, and transmission media

Summary (continued)

- Network services include file, print, communications, mail, Internet, and management services
- Certification is the process of mastering material pertaining to a particular hardware system, OS, programming language, or other software application and then proving your mastery by passing a series of exams