Cisco Networking Academy
Mind Wide Open

Chapter 1:
Explore the Network

Introduction to Networks v5.1

Chapter Outline

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Section 1.1: Globally Connected

Upon completion of this section, you should be able to:

- Explain how networks affect the way we interact, learn, work, and play.
- Explain how host devices can be used as clients, servers, or both.

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Topic 1.1.1: Networking Today

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Networks in Our Daily Lives

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Technology Then and Now

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No Boundaries

Networks support the way we:

- Learn
- Communicate
- Work
- Play

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Topic 1.1.2:
Providing Resources in a Network

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Networks of Many Sizes

Small Home Networks

Small Office/Home Office Networks

Medium to Large Networks

World Wide Networks

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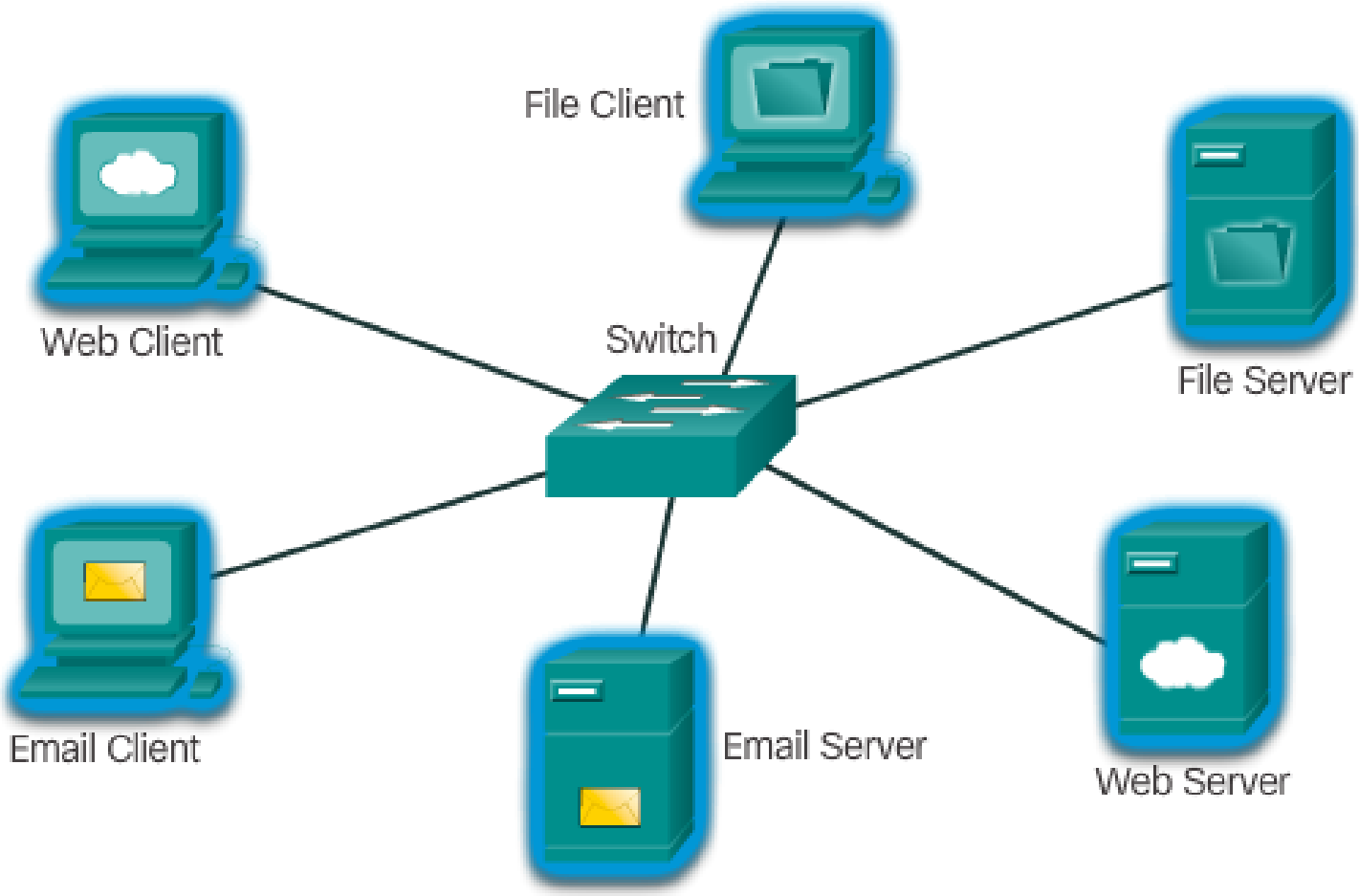
Clients and Servers



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Peer-to-Peer

The advantages of peer-to-peer networking:

- Easy to set up
- Less complexity
- Lower cost since network devices and dedicated servers may not be required
- Can be used for simple tasks such as transferring files and sharing printers

The disadvantages of peer-to-peer networking:

- No centralized administration
- Not as secure
- Not scalable
- All devices may act as both clients and servers which can slow their performance

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Section 1.2: LANs, WANs, and the Internet

Upon completion of this section, you should be able to:

- Explain the use of network devices.
- Compare the devices and topologies of a LAN to the devices and topologies of a WAN.
- Describe the basic structure of the Internet.
- Explain how LANs and WANs interconnect to the Internet.

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Topic 1.2.1:
Network Components

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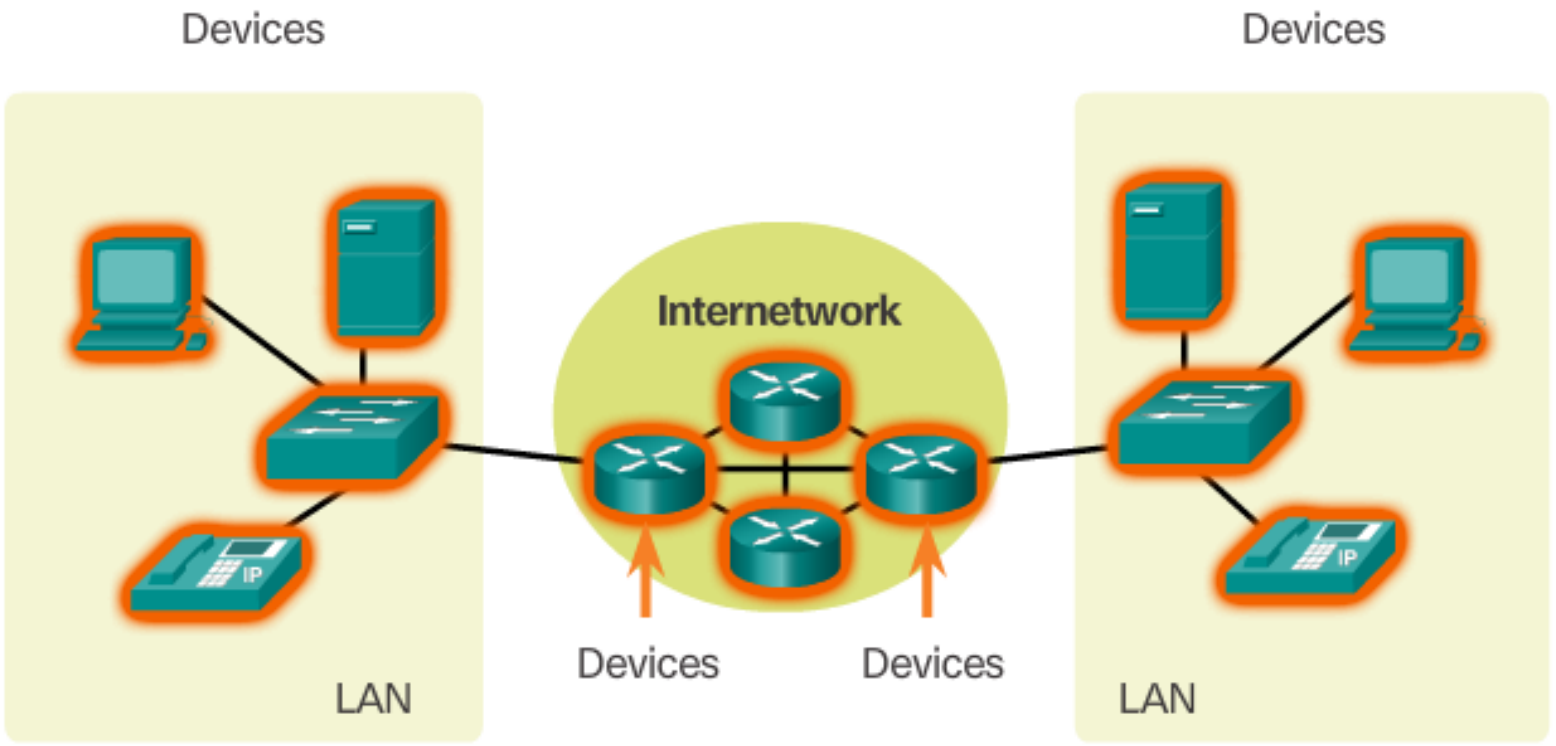
Overview of Network Components



Devices | Media | Services

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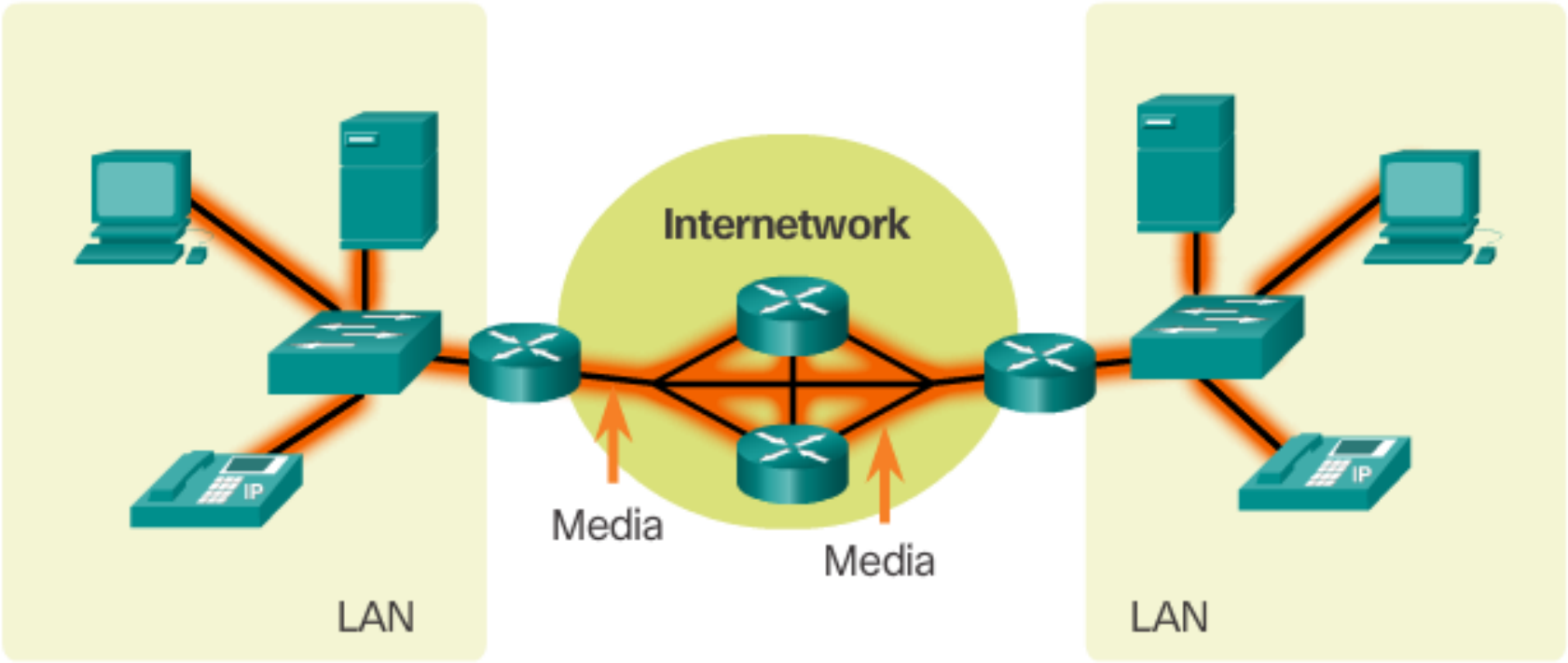
Overview of Network Components (cont.)



Devices | Media | Services

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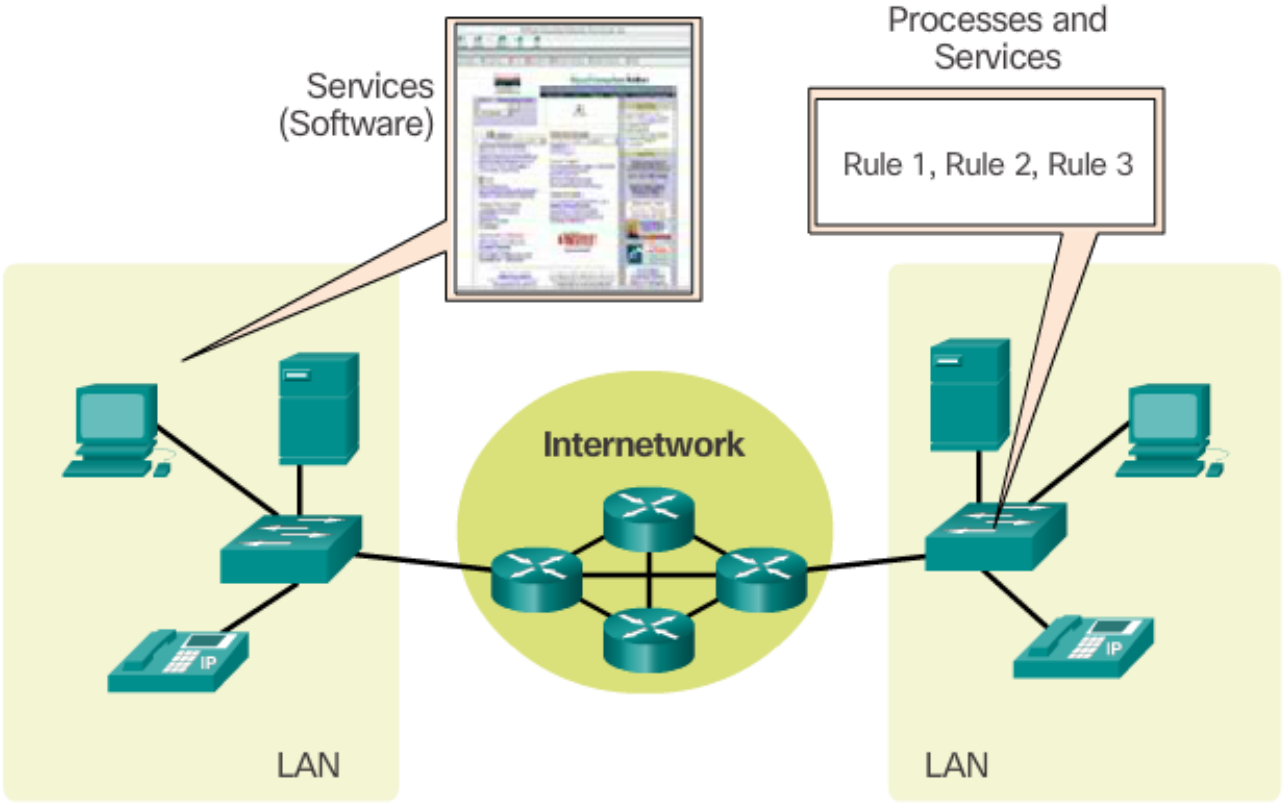
Overview of Network Components (cont.)



Devices | Media | Services

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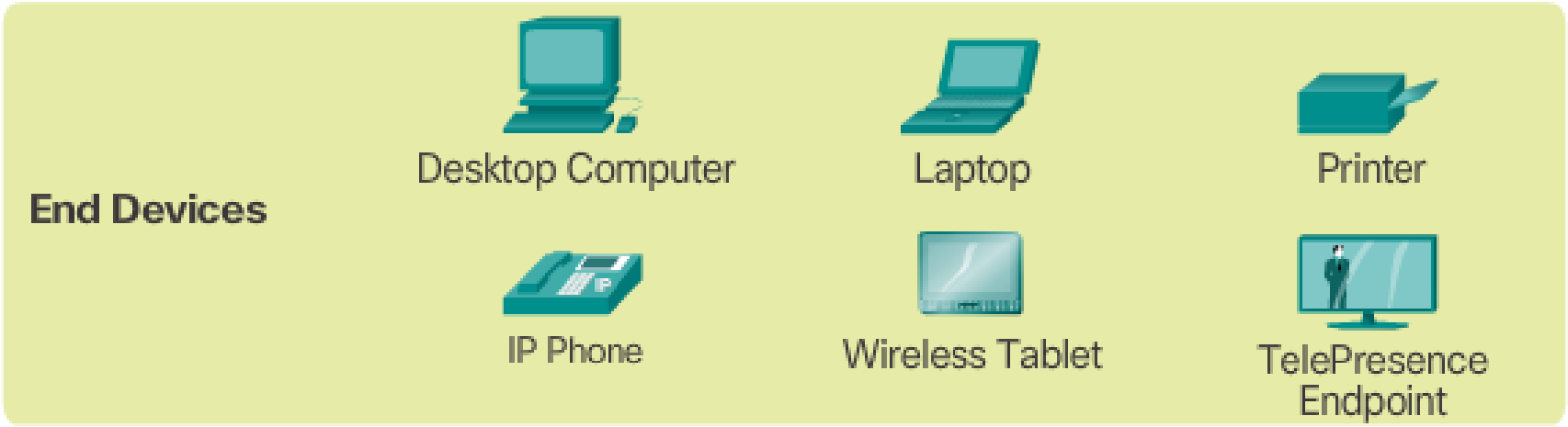
End Devices



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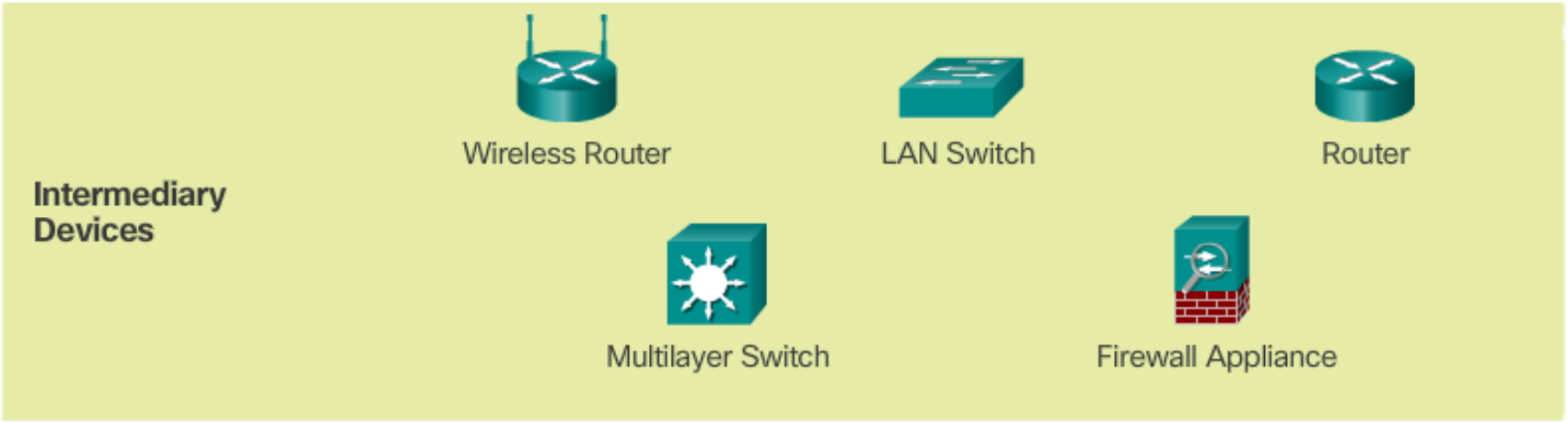
Intermediary Network Devices



Intermediary network devices perform some or all of these functions:

- Regenerate and retransmit data signals
- Maintain information about what pathways exist through the network and internetwork
- Notify other devices of errors and communication failures
- Direct data along alternate pathways when there is a link failure
- Classify and direct messages according to priorities
- Permit or deny the flow of data, based on security settings

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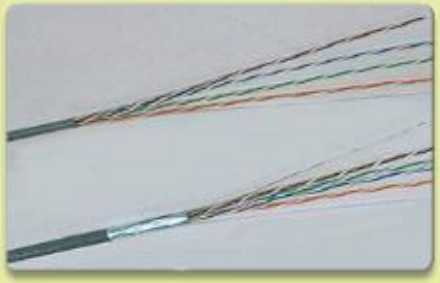
Network Media

Copper



Fiber Optic

Wireless

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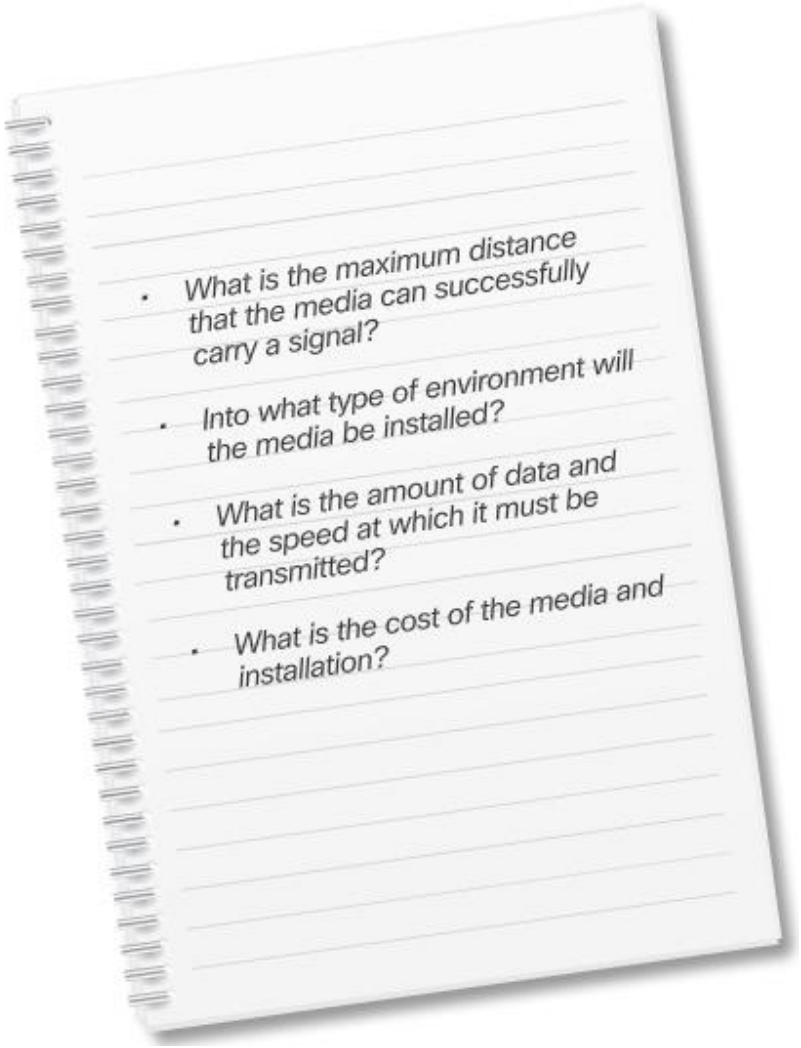
Network Media (cont.)



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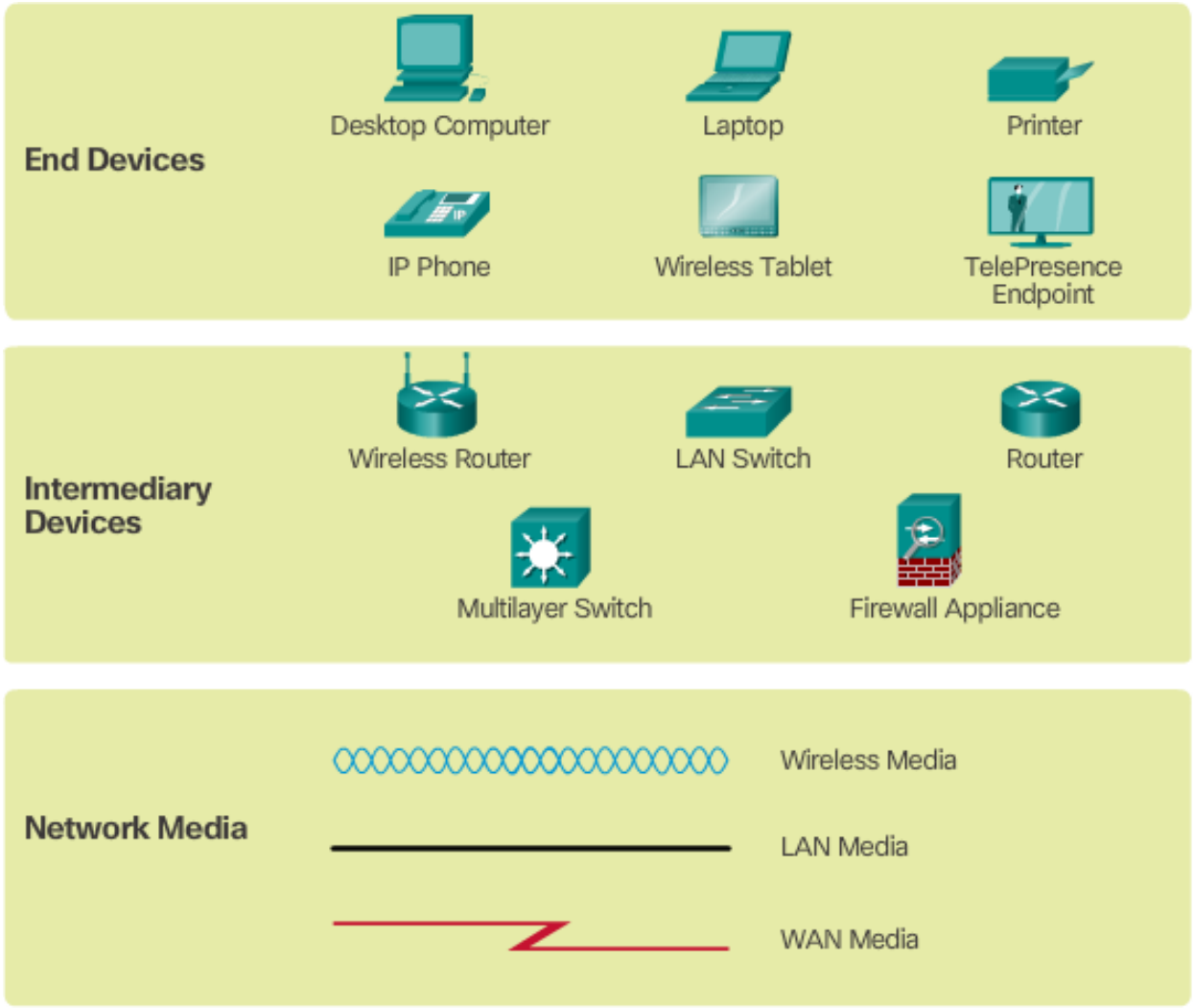
Network Representations



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Network Representations (Cont.)

Network Interface Card

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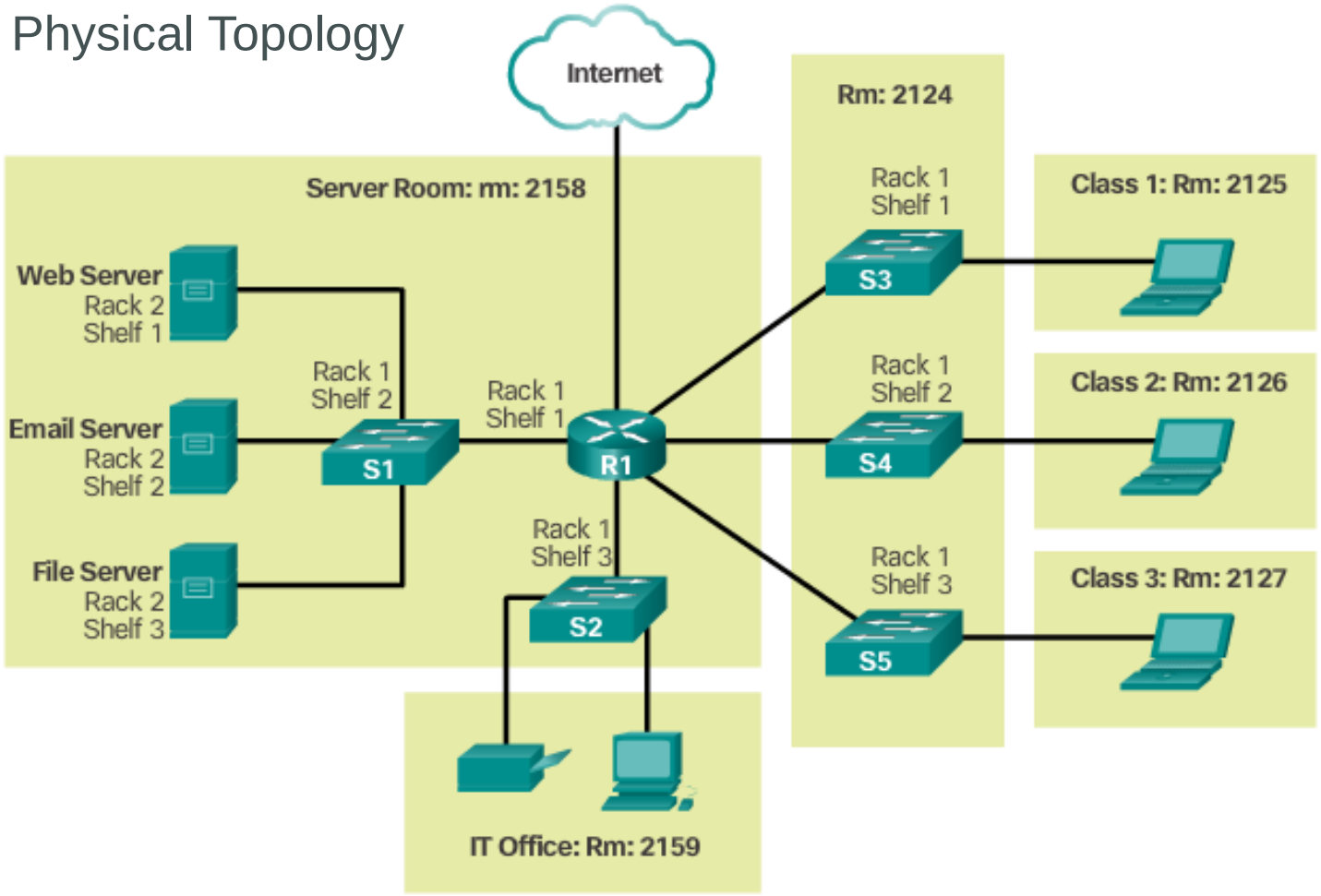
Topology Diagrams

Physical Topology



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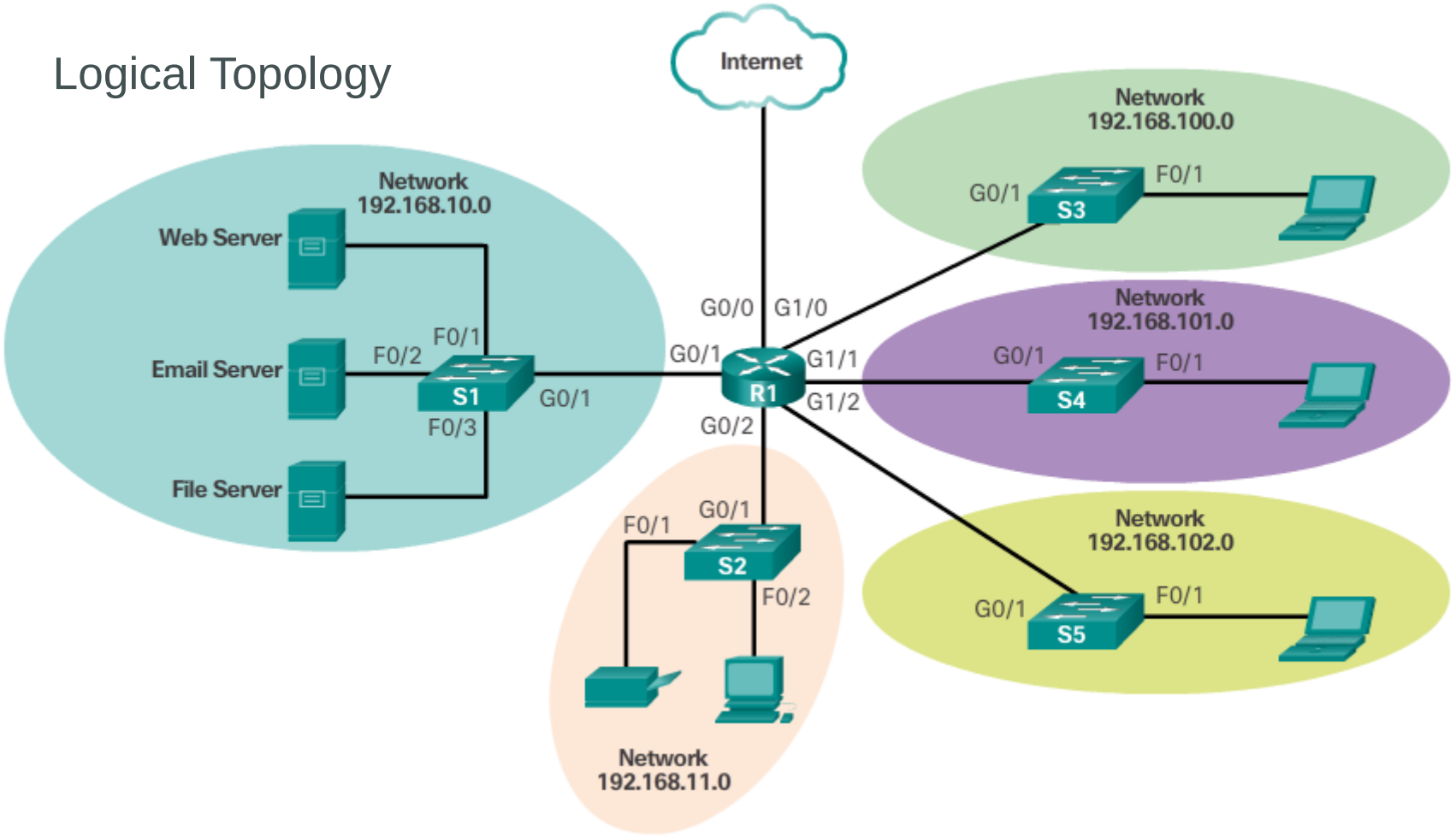
Topology Diagrams (Cont.)

Logical Topology



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Topic 1.2.2:
LANs and WANs

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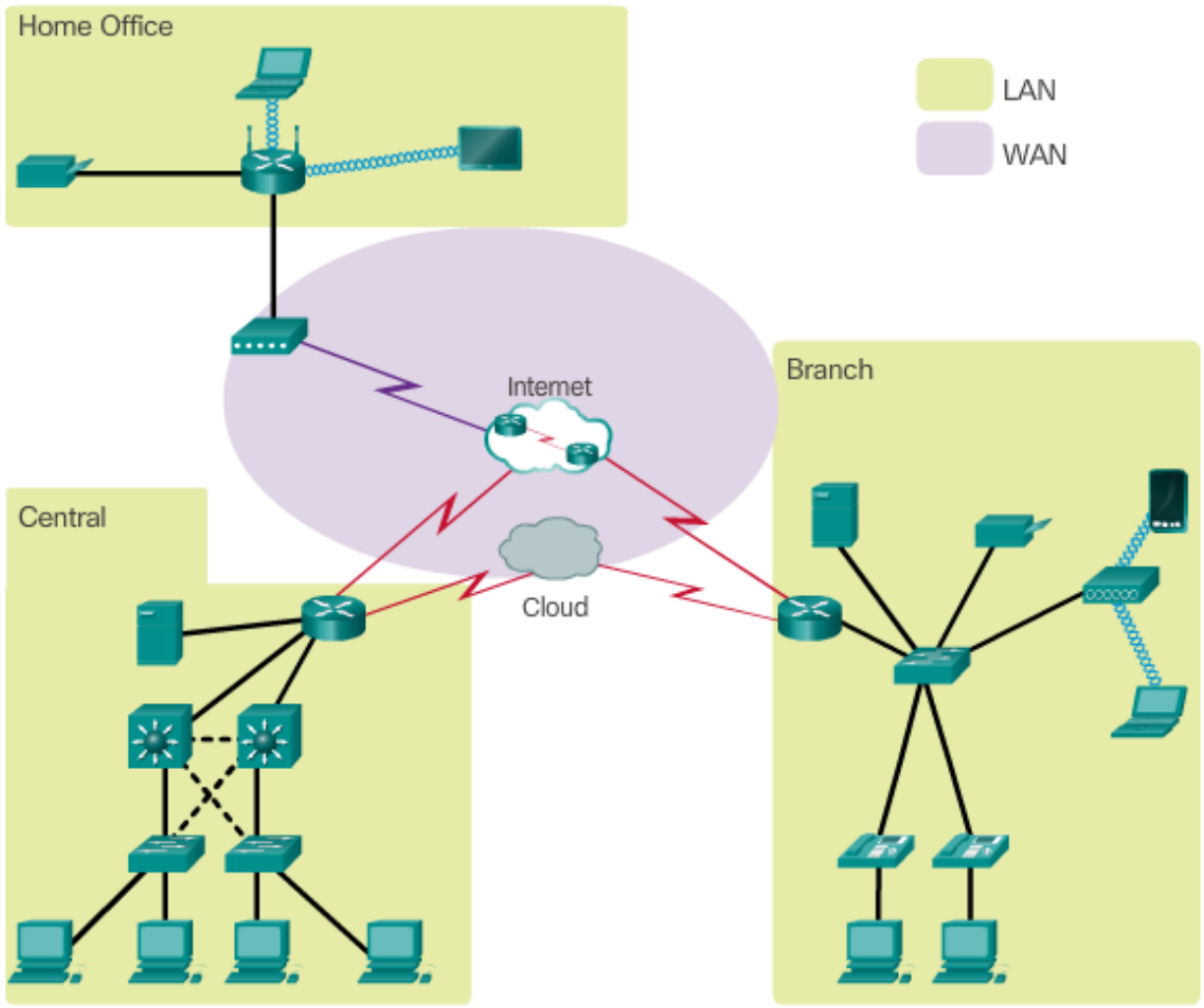
Types of Networks



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Types of Networks

The two most common types of network infrastructures are:

- Local Area Network (LAN)
- Wide Area Network (WAN)

Other types of networks include:

- Metropolitan Area Network (MAN)
- Wireless LAN (WLAN)
- Storage Area Network (SAN)

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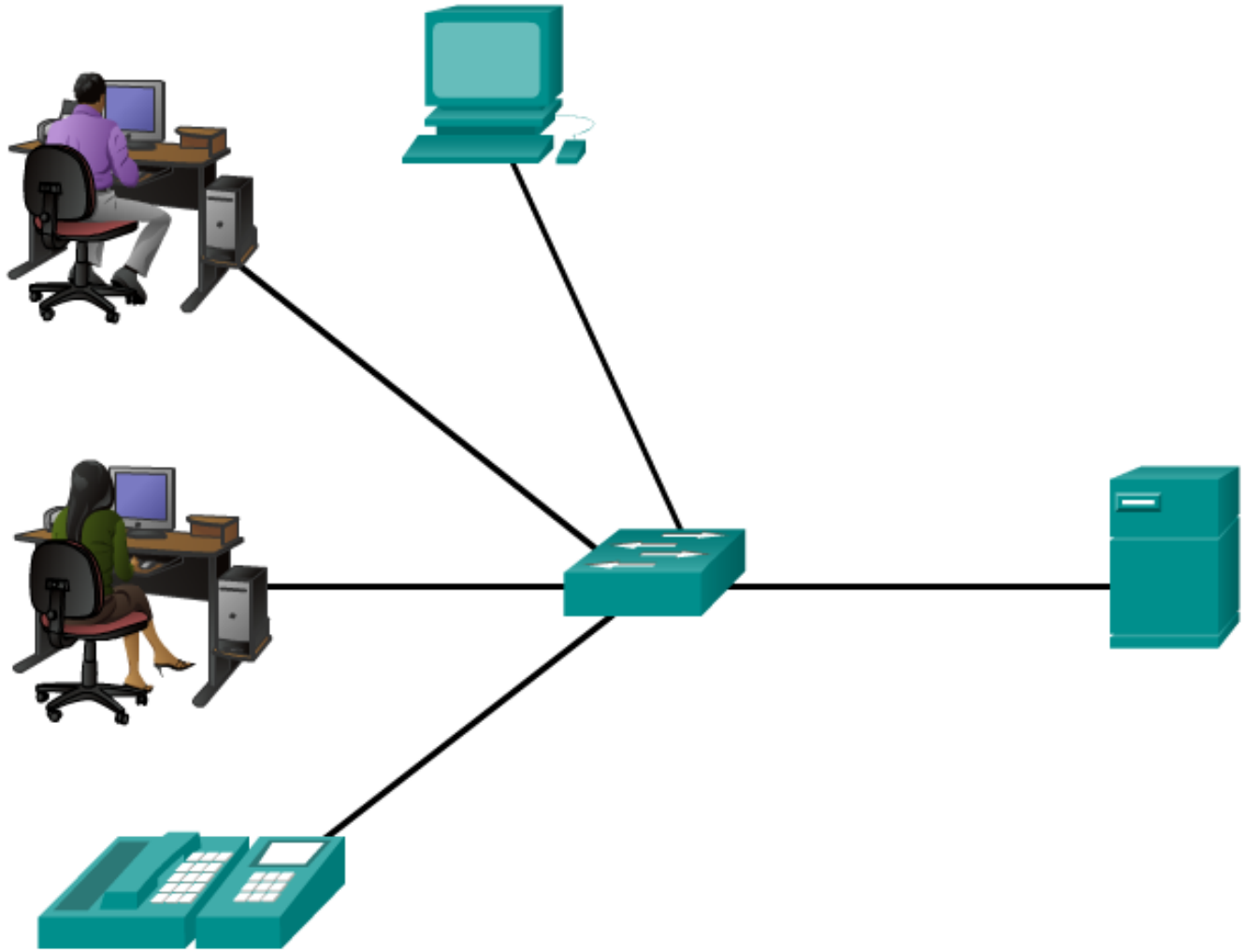
Local Area Networks



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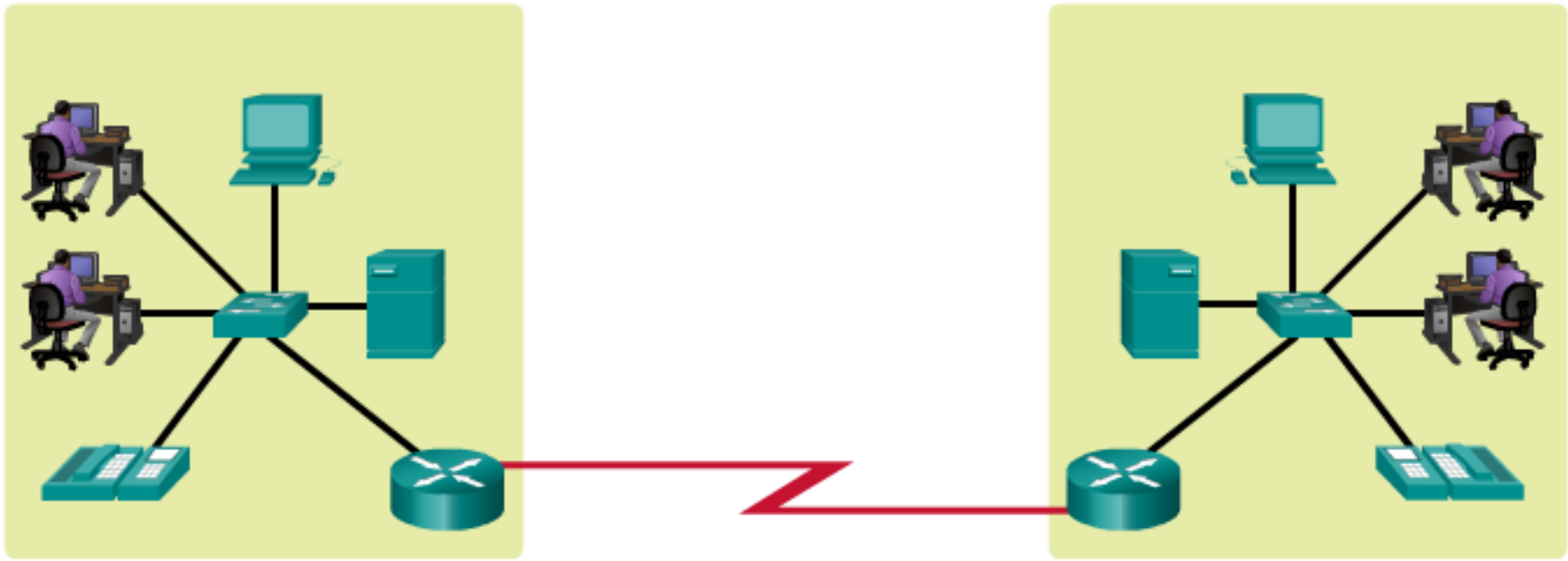
Wide Area Networks

LANs separated by geographic distance are connected by a network known as a WAN.



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Topic 1.2.3:
The Internet, Intranets, and Extranets

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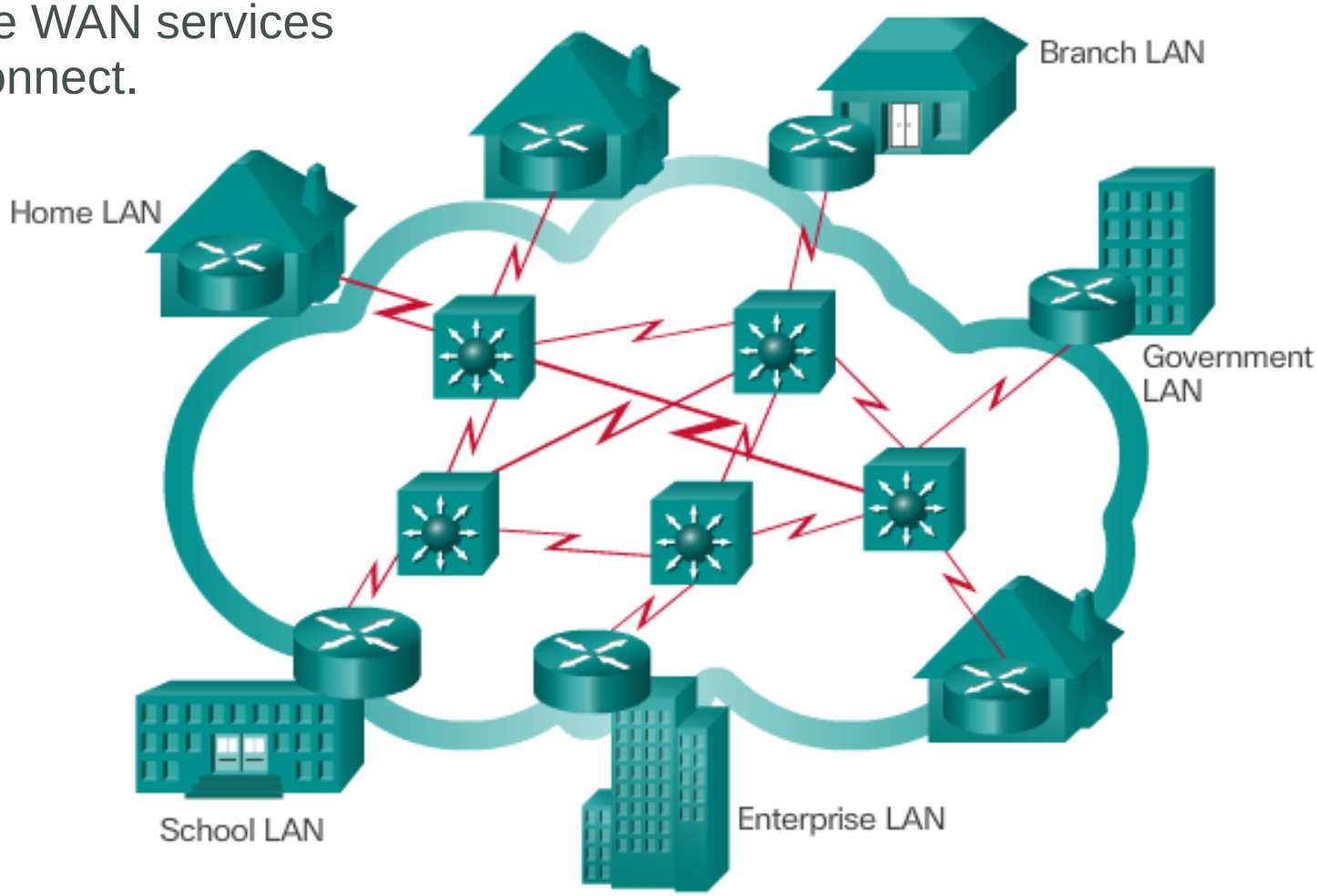
The Internet

LANs use WAN services to interconnect.



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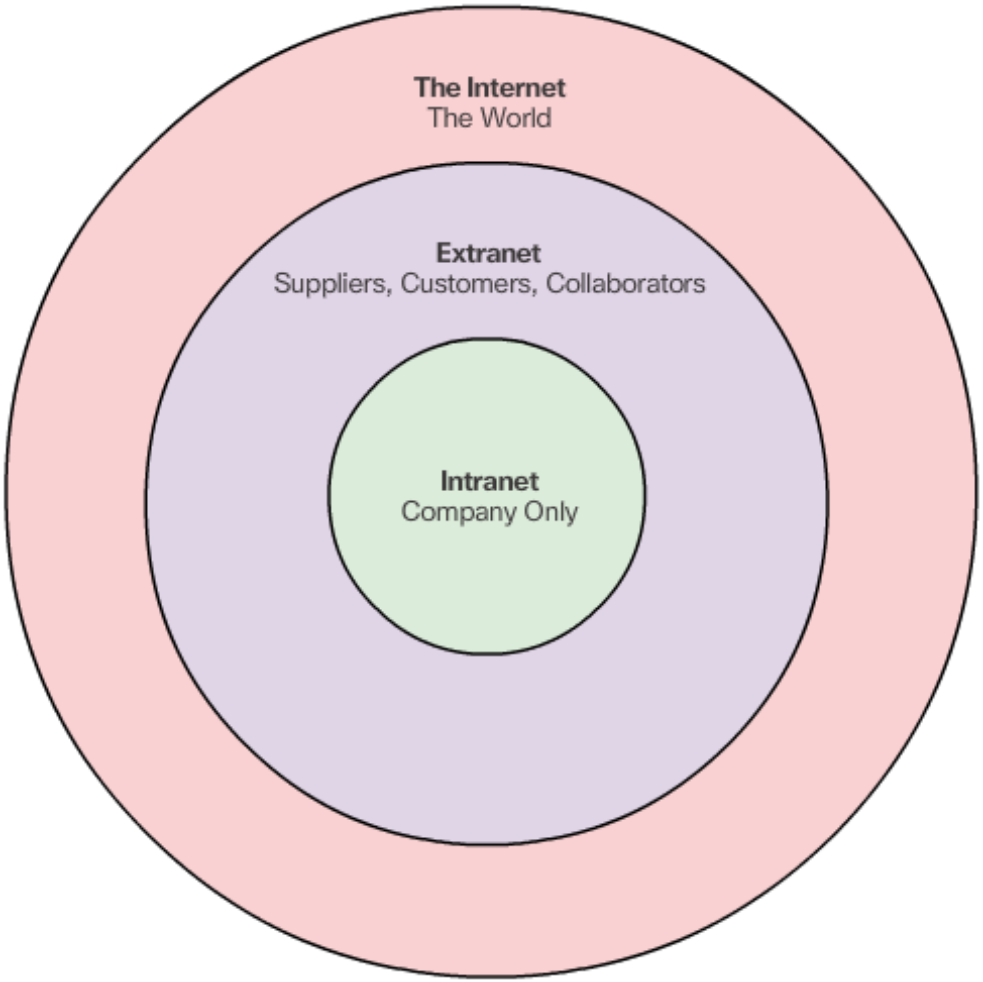
Intranets and Extranets



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Topic 1.2.4:
Internet Connections

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Internet Access Technologies

- Internet Service Provider (ISP)
- Broadband cable
- Broadband Digital Subscriber Line (DSL)
- Wireless WANs
- Mobile Services
- Business DSL
- Leased Lines
- Metro Ethernet

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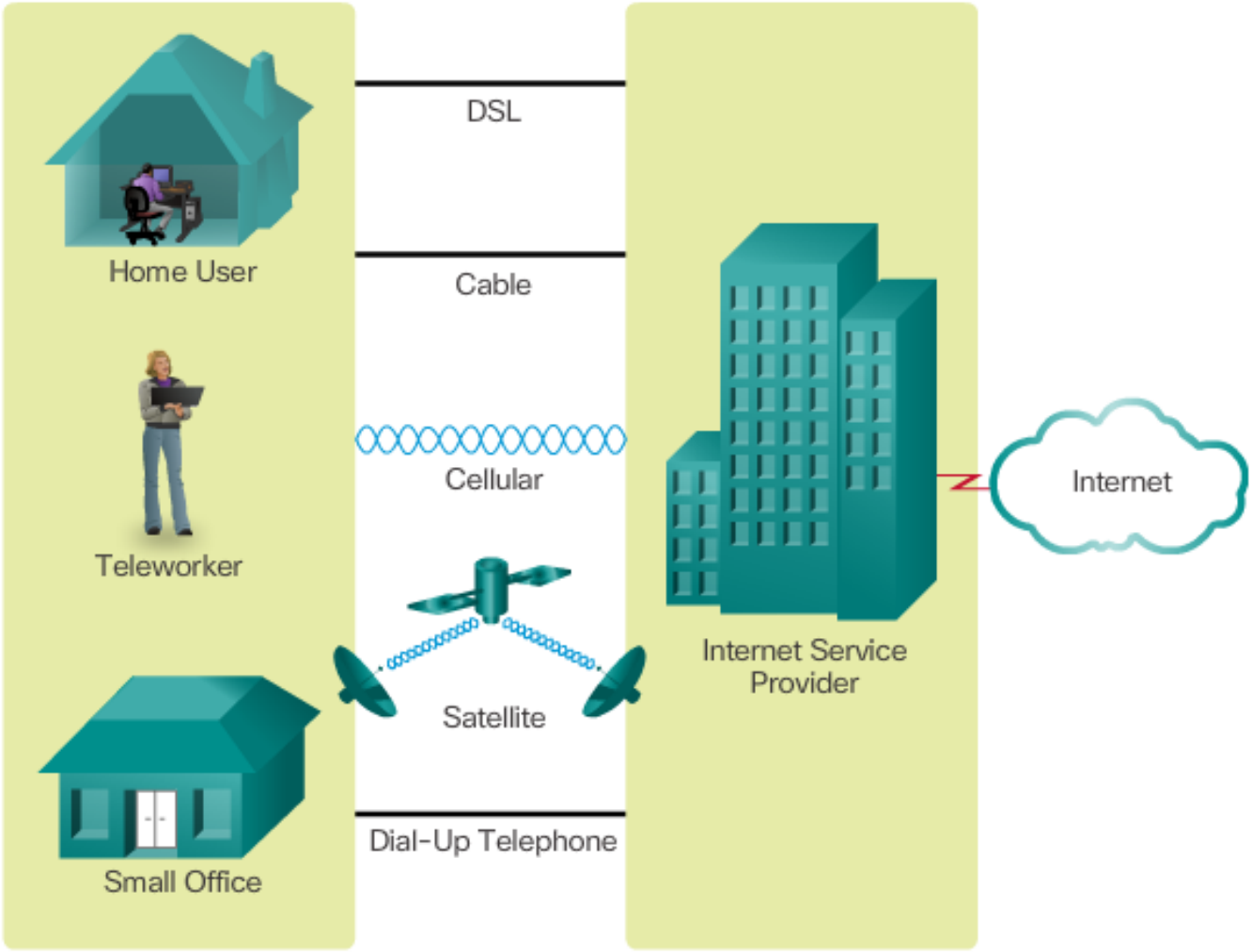
Home and Small Office Internet Connections



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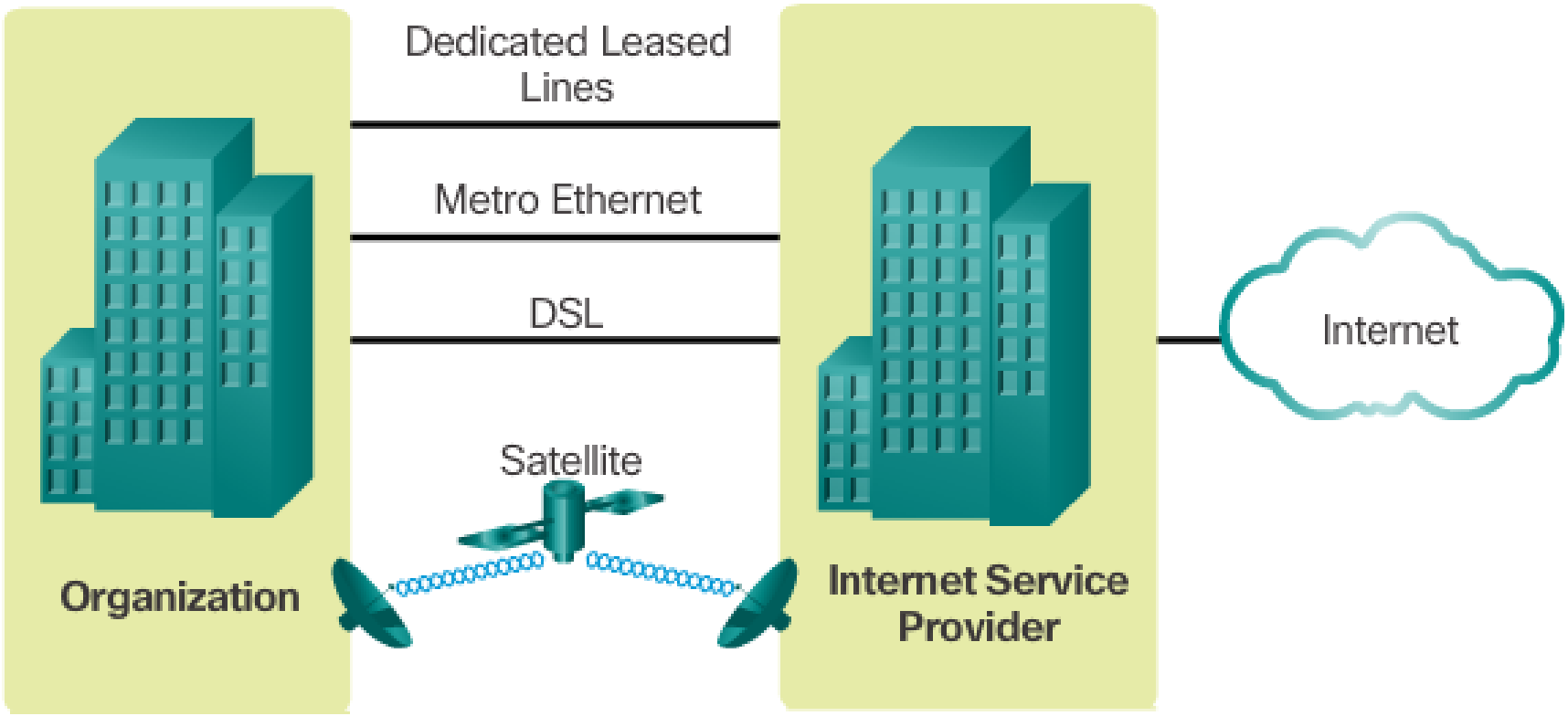
Business Internet Connections



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Section 1.3: The Network as a Platform

Upon completion of this section, you should be able to:

- Explain the concept of a converged network.
- Describe the four basic requirements of a reliable network.

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Topic 1.3.1:
Converged Networks

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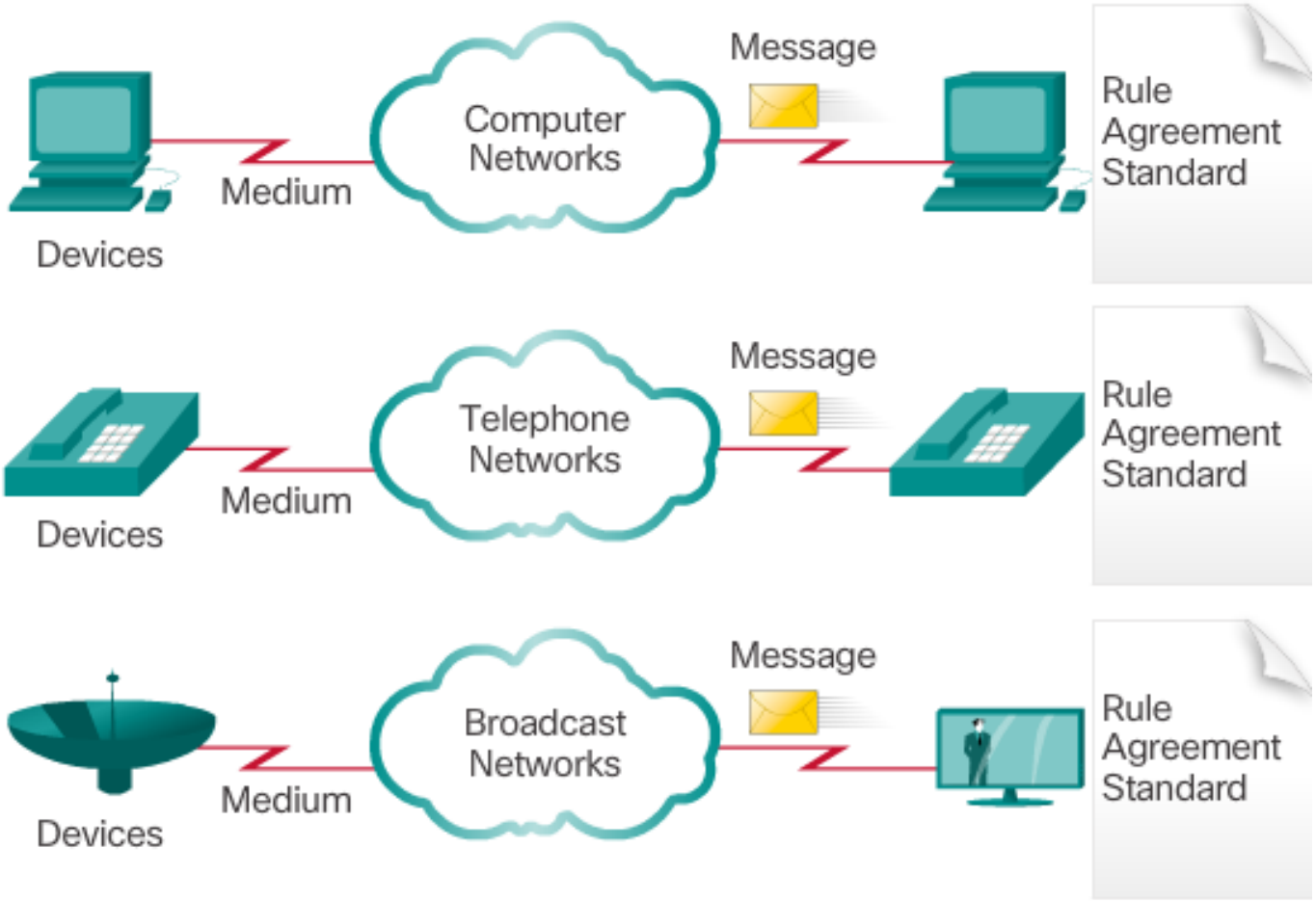
Traditional Separate Networks



Multiple services are running on multiple networks.

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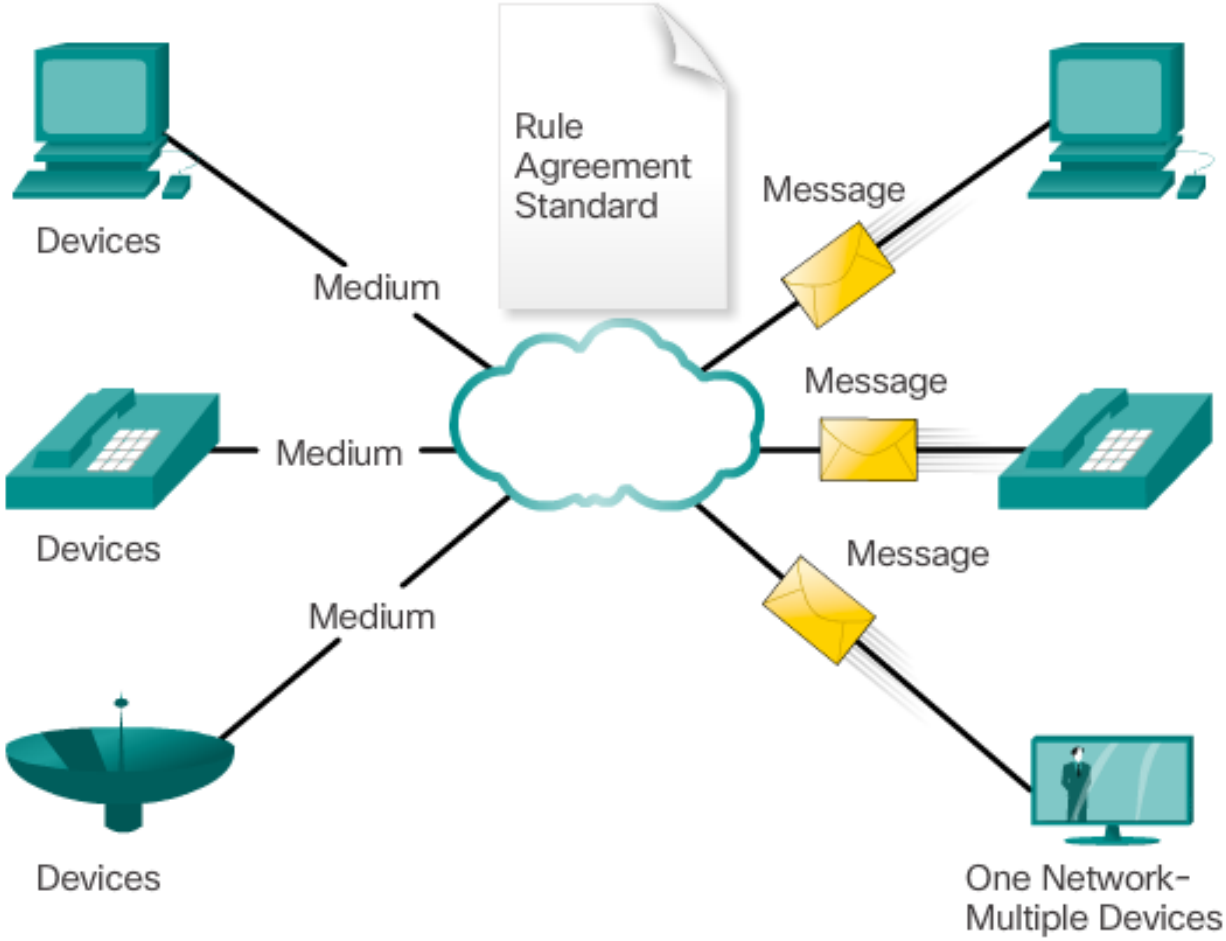
The Converging Networks



Converged data networks carry multiple services on one network.

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Topic 1.3.2:
Reliable Networks

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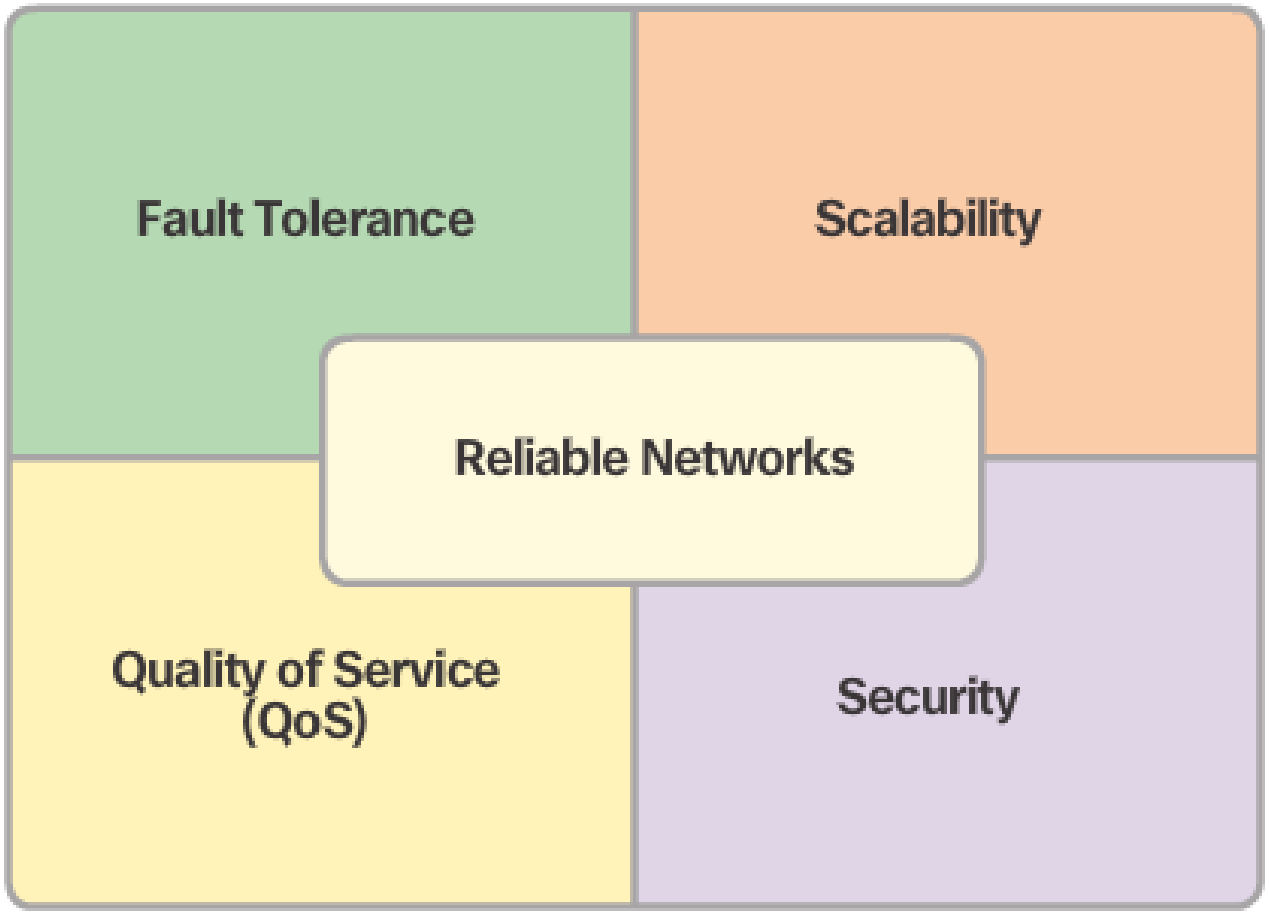
Network Architecture



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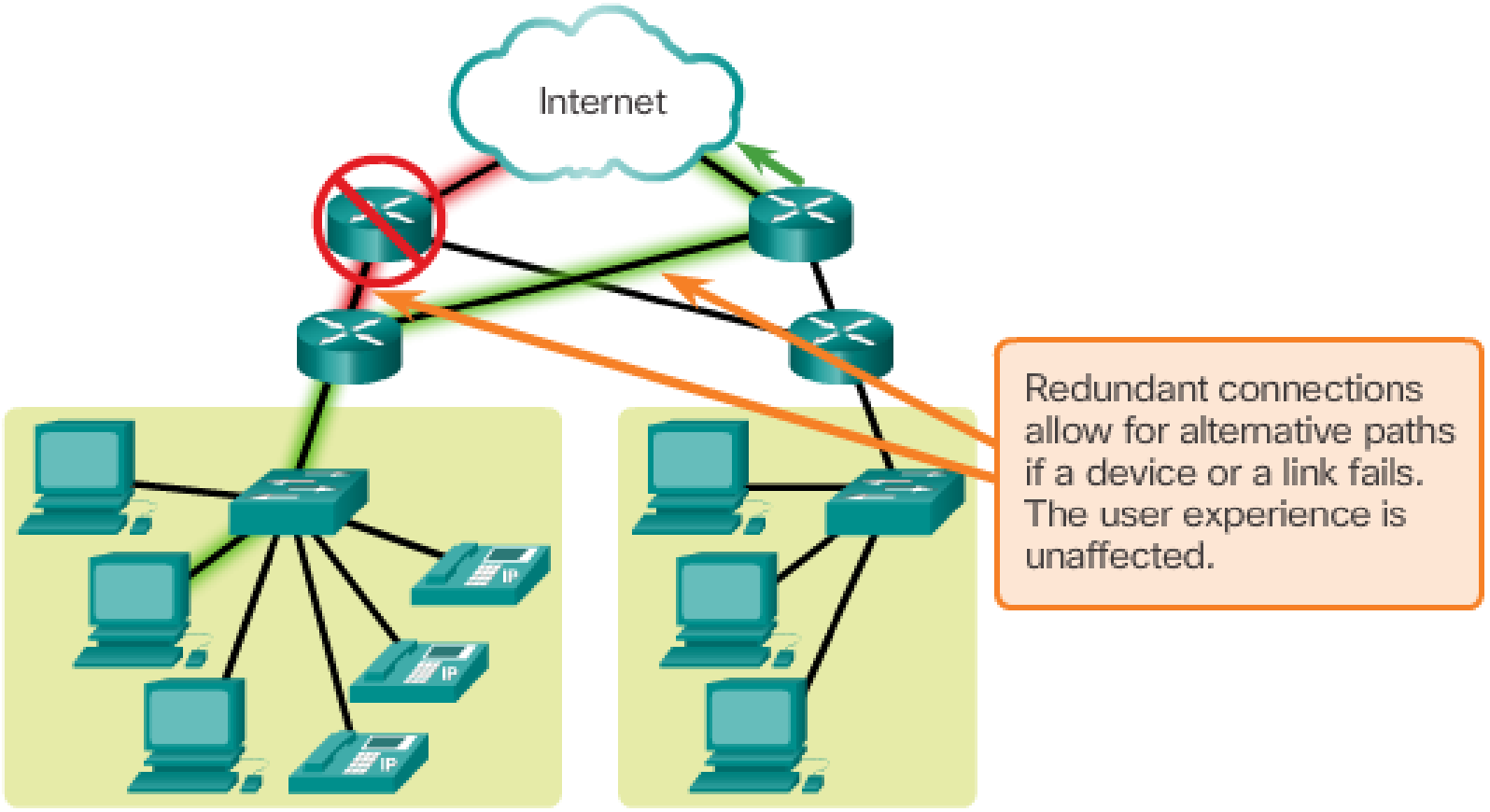
Fault Tolerance



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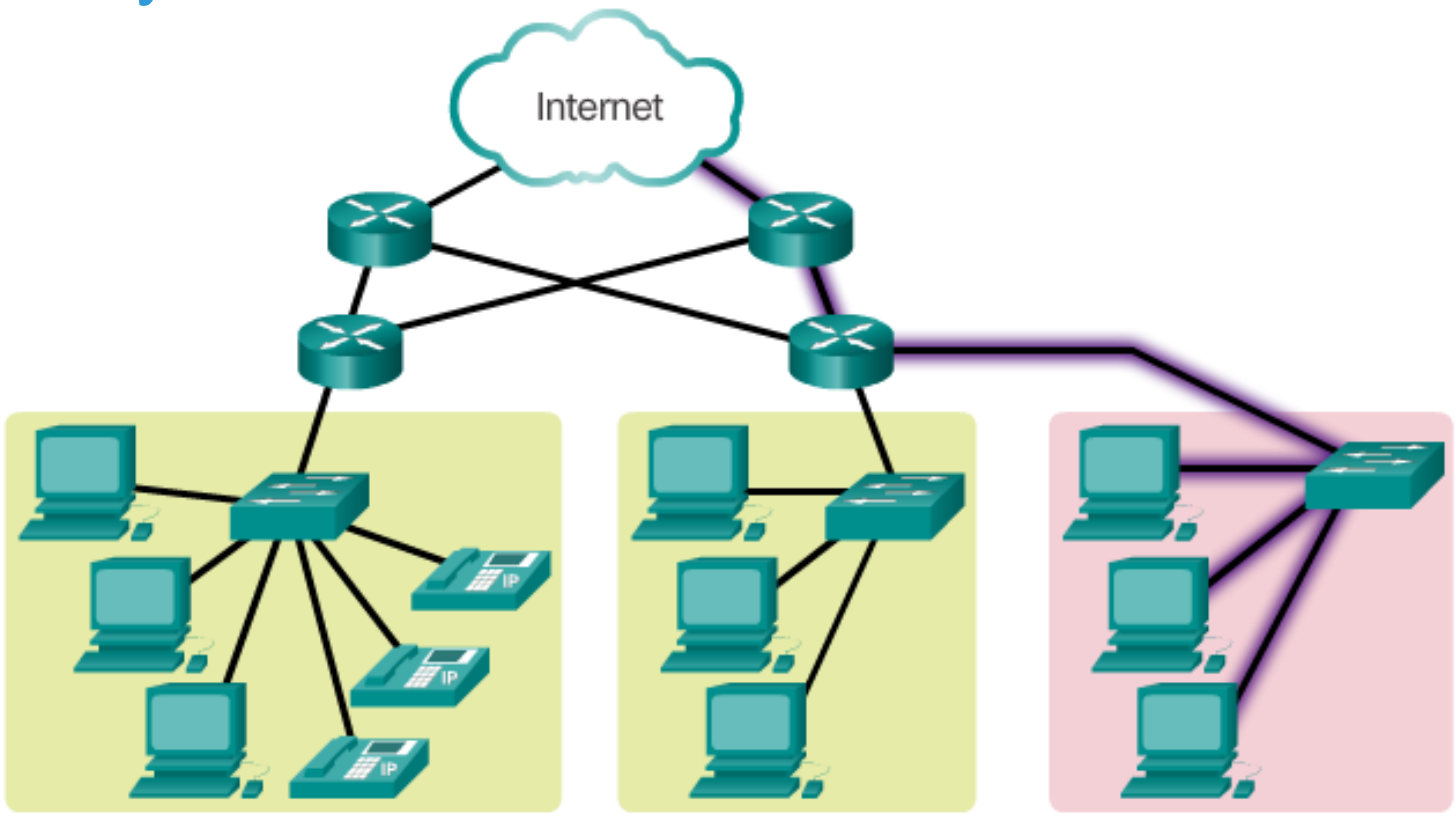
Scalability



Additional users and whole networks can be connected to the Internet without degrading performance for existing users.

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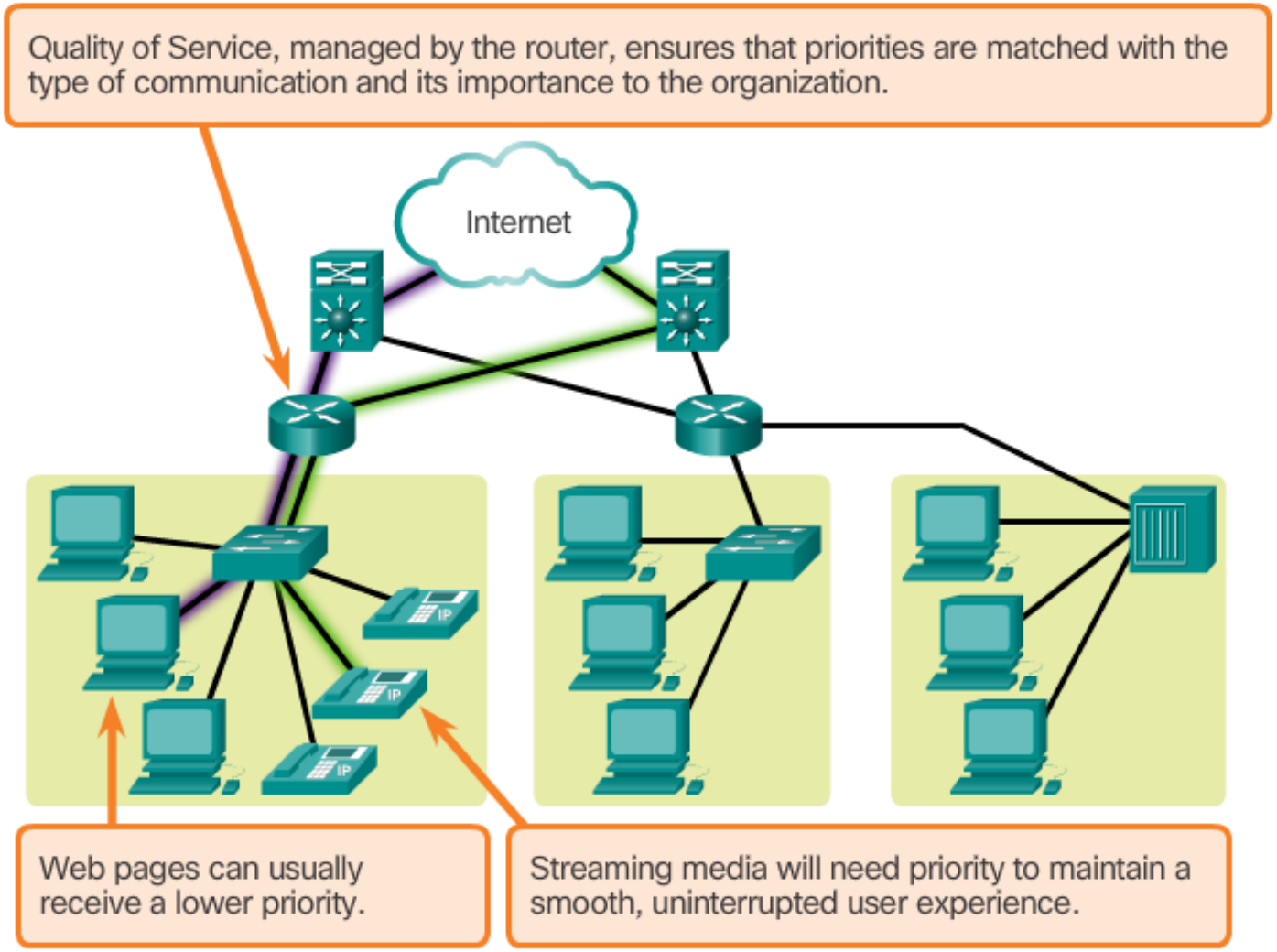
Quality of Service



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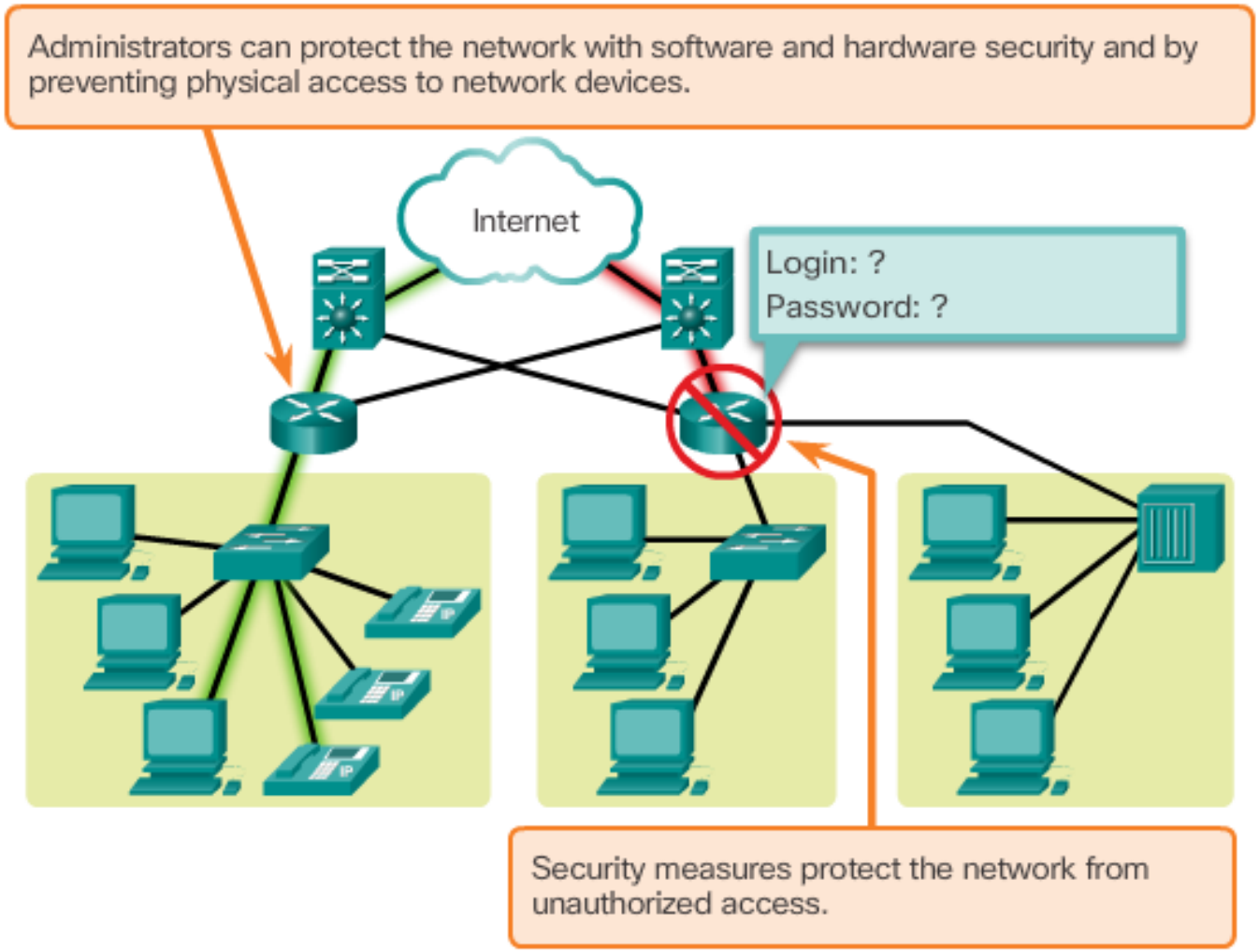
Security



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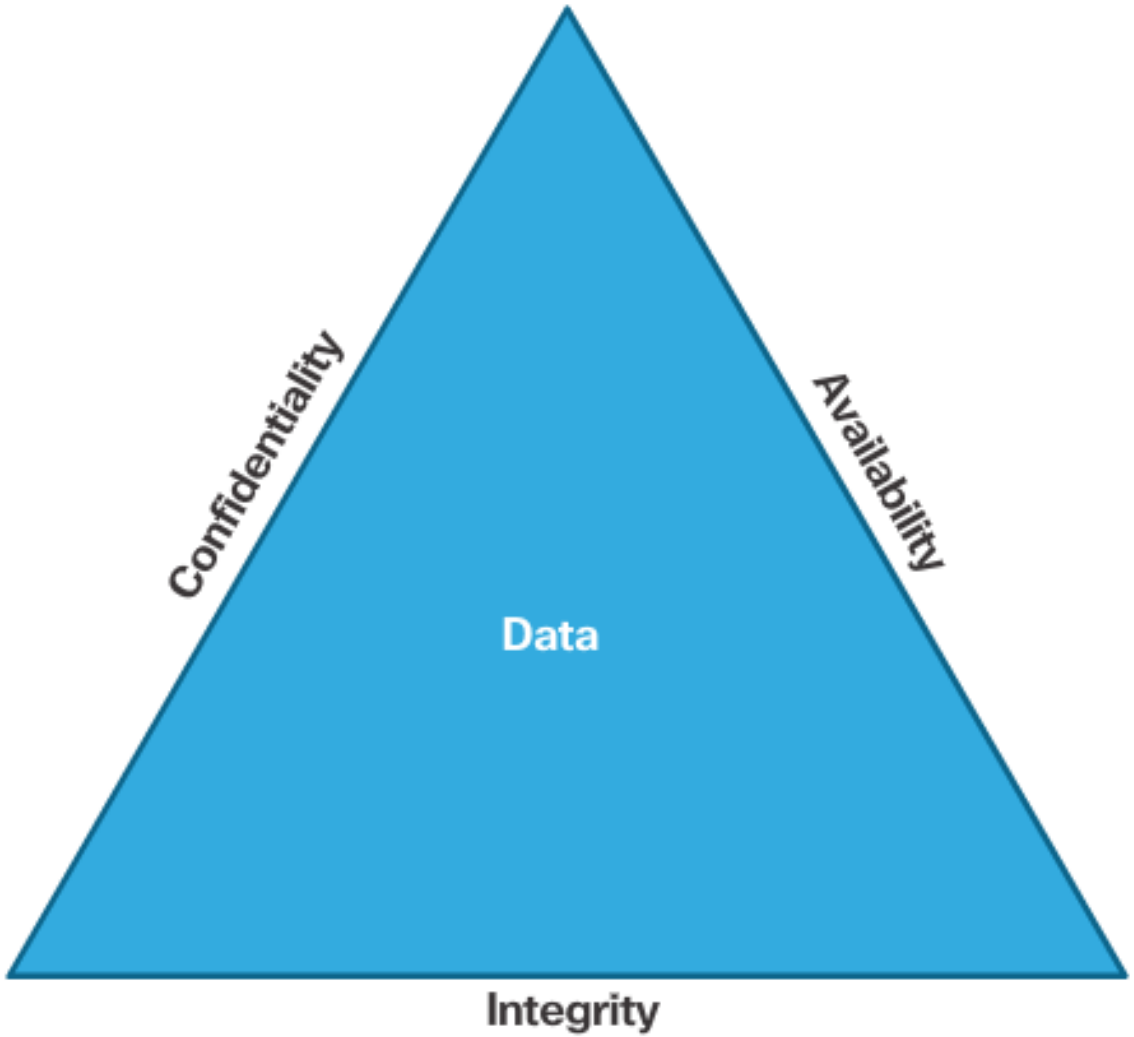
Security (cont.)



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Section 1.4: The Changing Network Environment

Upon completion of this section, you should be able to:

- Explain how trends such as BYOD, online collaboration, video, and cloud computing are changing the way we interact.
- Explain how networking technologies are changing the home environment.
- Identify basic security threats and solutions for both small and large networks.
- Describe the importance of understanding the underlying switching and routing infrastructure of a network.

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Topic 1.4.1: Network Trends

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New Trends

Top trends include:

- Bring Your Own Device (BYOD)
- Online collaboration
- Video communications
- Cloud computing

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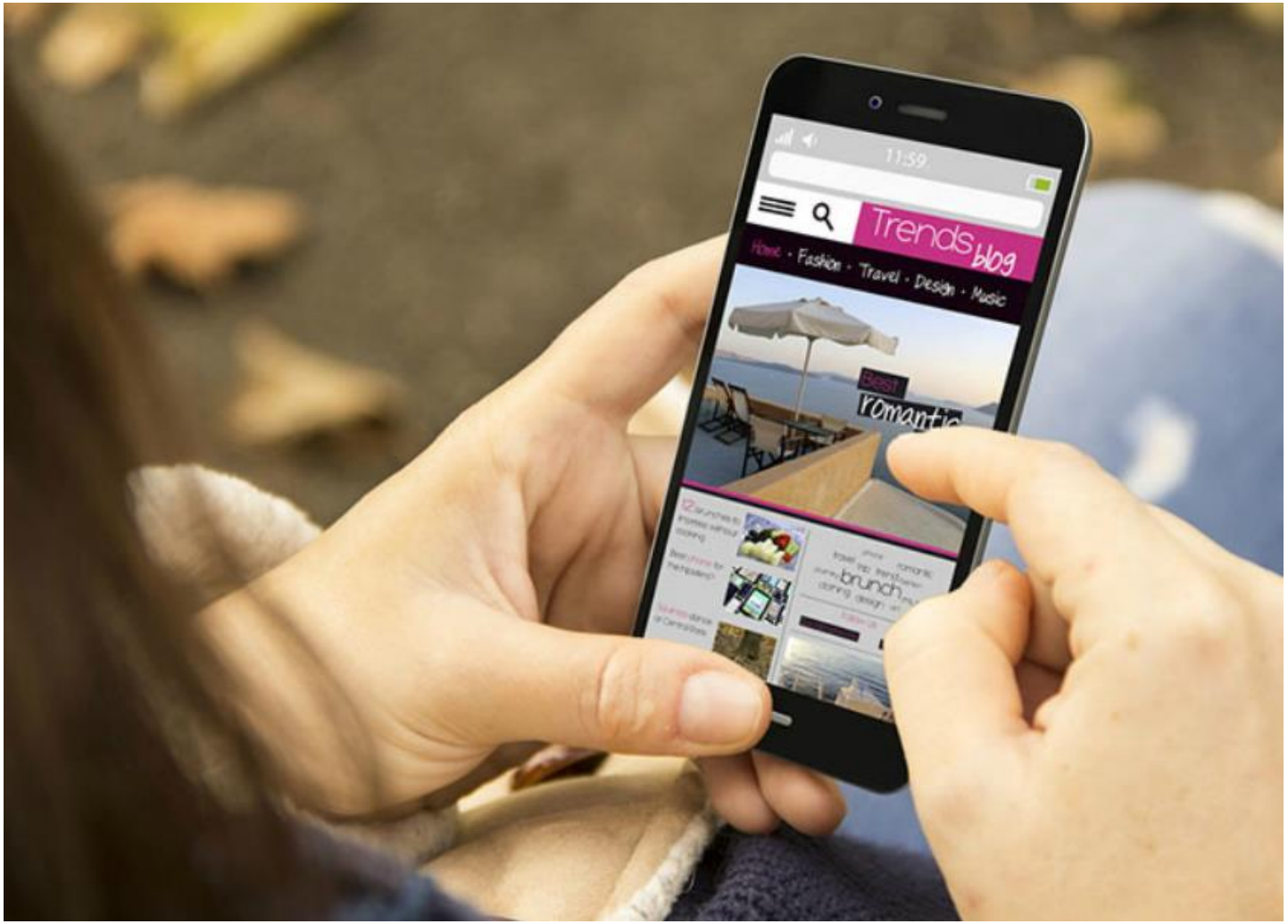
Bring Your Own Device



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Online Collaboration

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Video Communication

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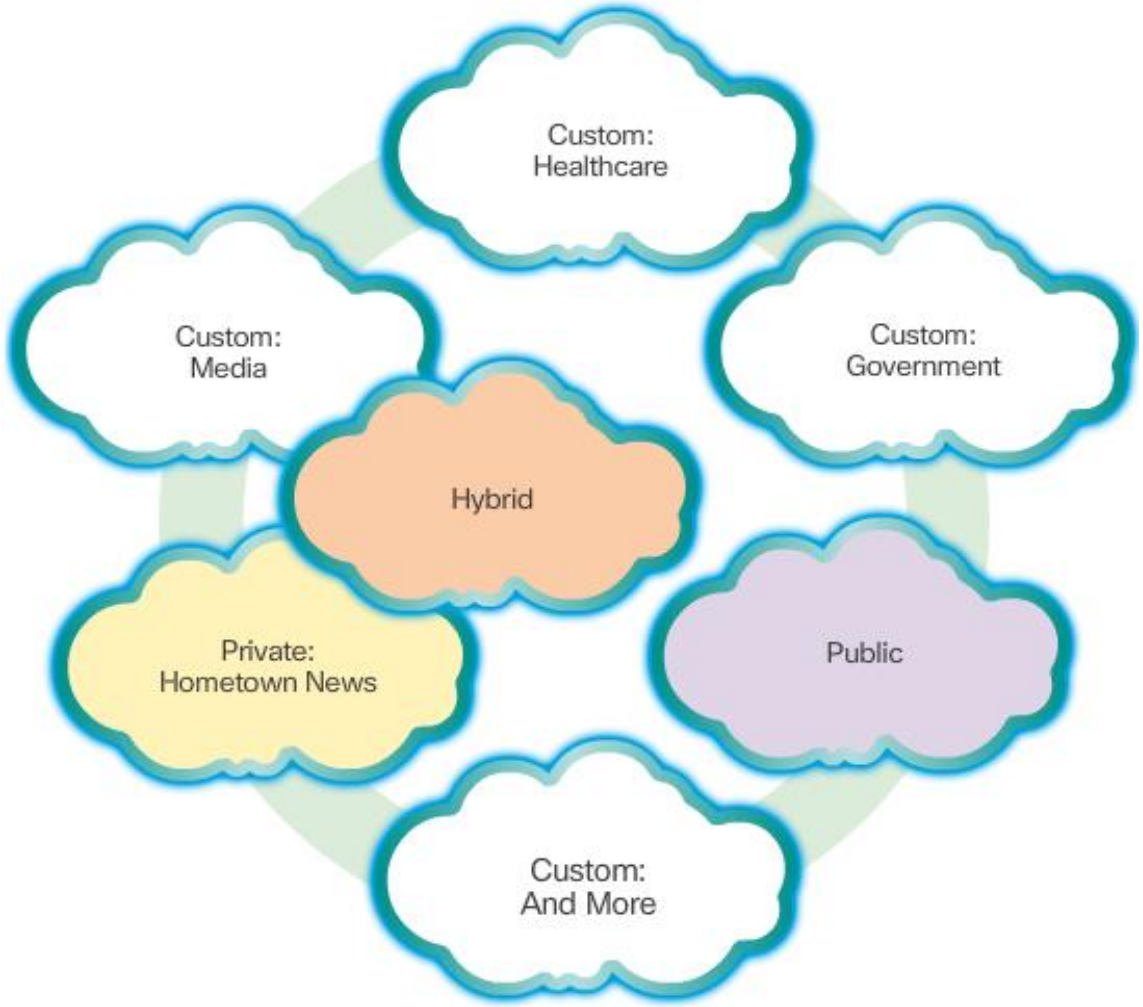
Cloud Computing



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Topic 1.4.2:
Networking Technologies for the Home

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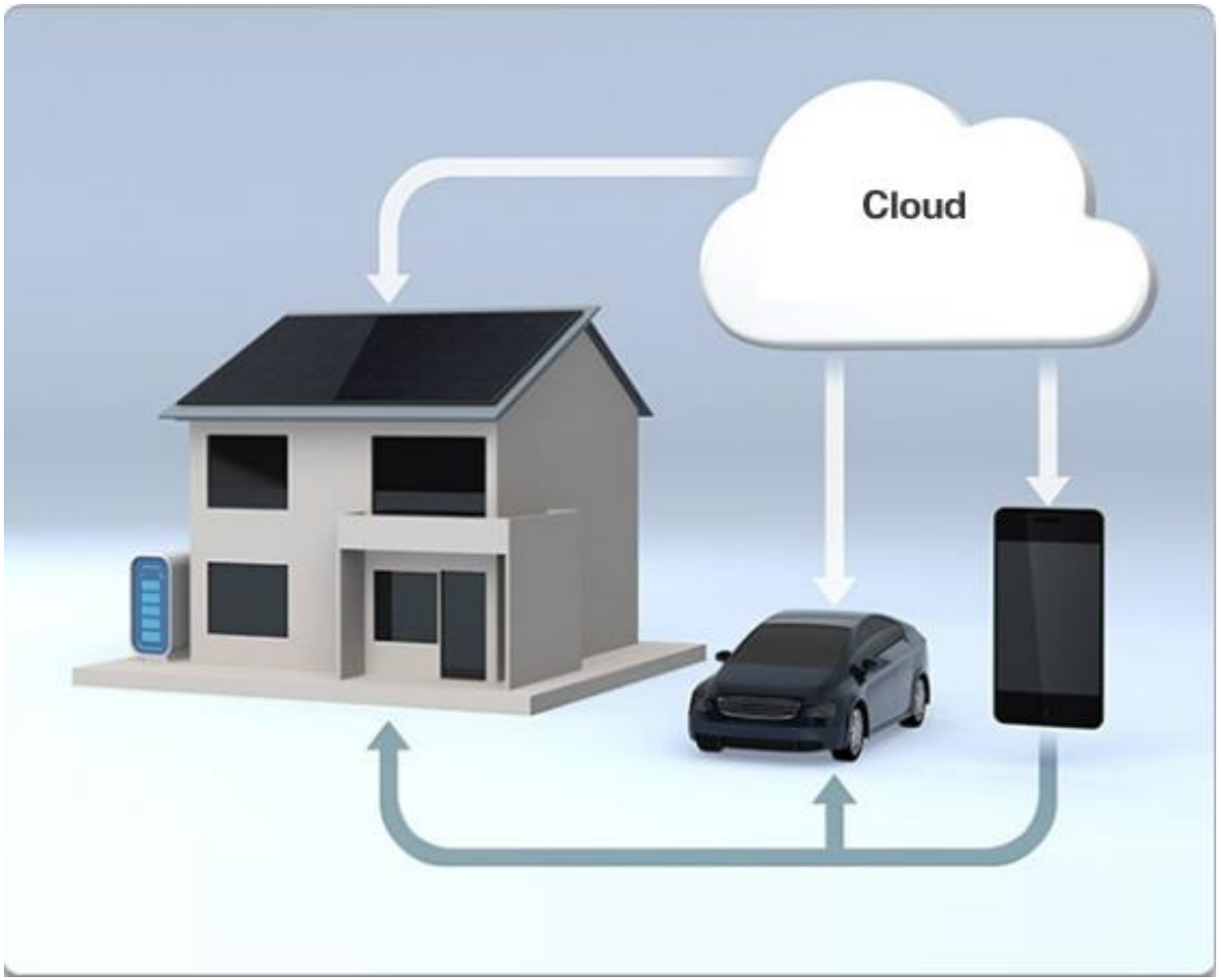
Technology Trends in the Home



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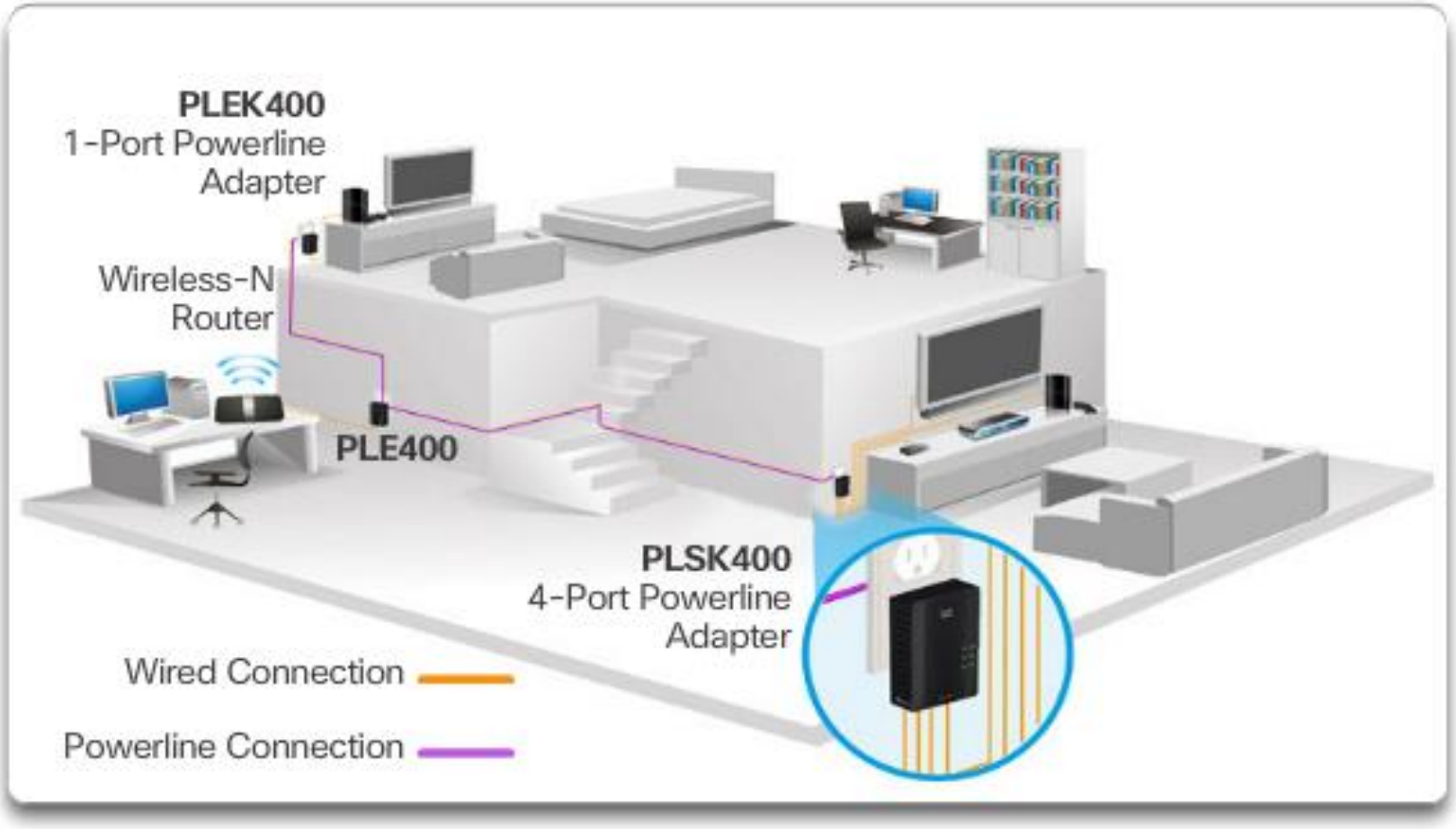
Powerline Networking



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Wireless Broadband

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Topic 1.4.3:
Network Security

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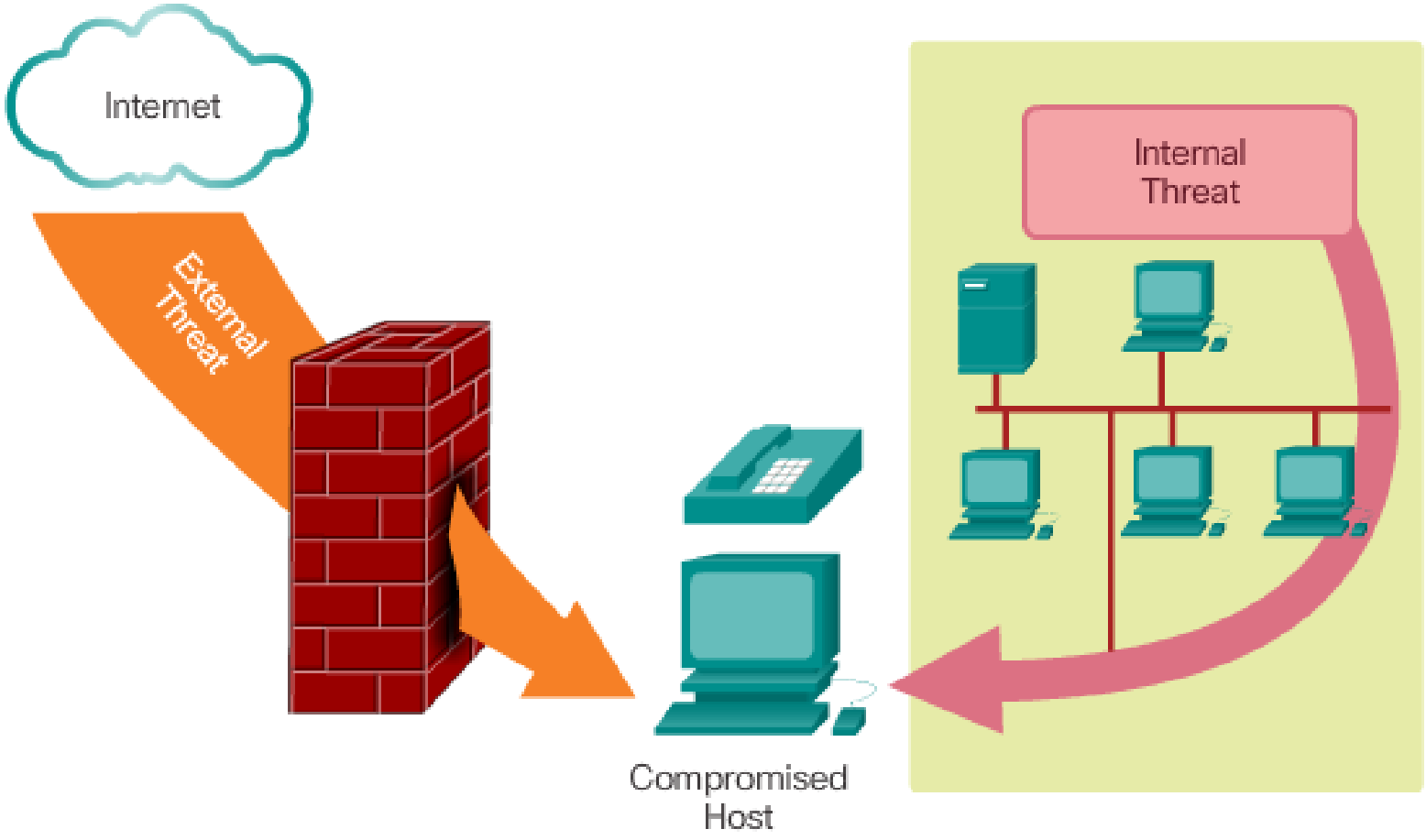
Security Threats



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Security Threats

The most common external threats to networks include:

- Viruses, worms, and Trojan horses
- Spyware and adware
- Zero-day attacks, also called zero-hour attacks
- Hacker attacks
- Denial of service attacks
- Data interception and theft
- Identity theft

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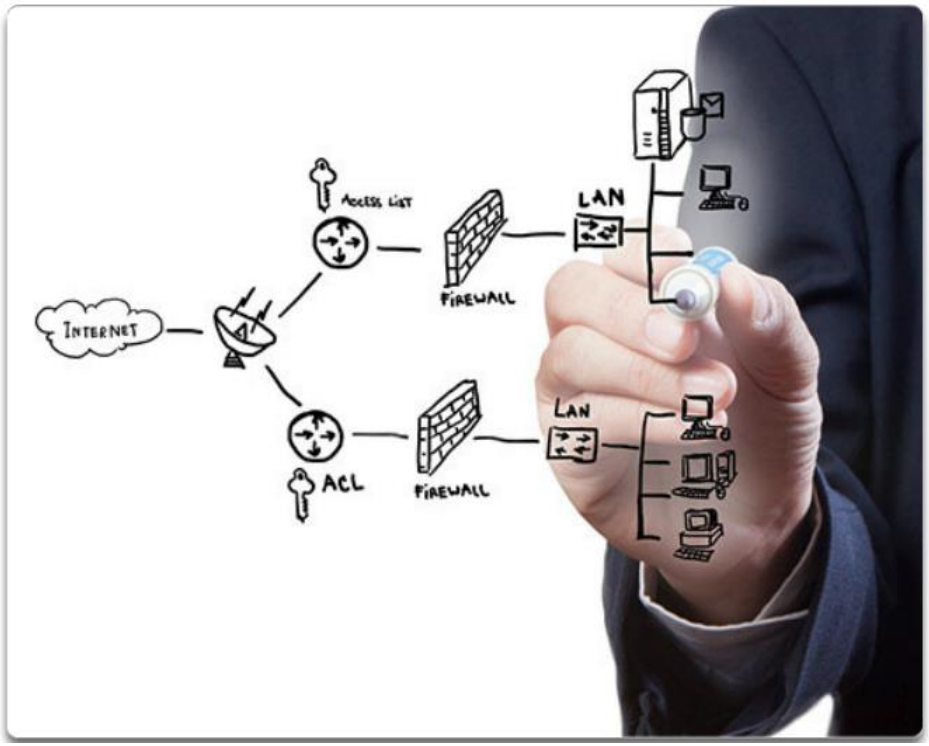
Security Solutions

Minimum solutions:

- Antivirus and antispyware
- Firewall filtering

Additional solutions:

- Dedicated firewall systems
- Access control lists (ACL)
- Intrusion prevention systems (IPS)
- Virtual Private Networks (VPNs)



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Topic 1.4.4:
Network Architecture

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Cisco Network Architecture

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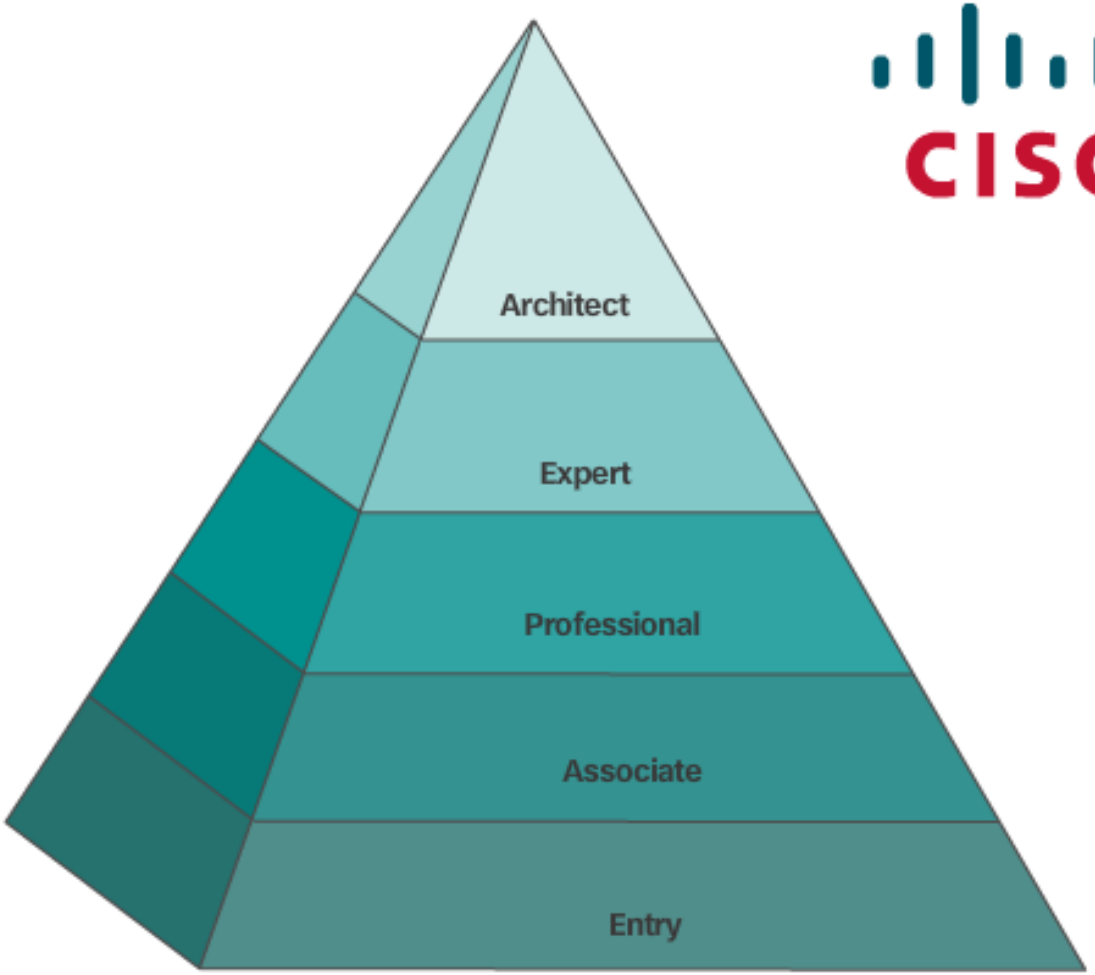
CCNA



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Section 1.5: Summary

Chapter Objectives:

- Explain how multiple networks are used in everyday life.
- Describe the topologies and devices used in a small to medium-sized business network.
- Explain the basic characteristics of a network that supports communication in a small to medium-sized business.
- Explain trends in networking that will affect the use of networks in small to medium-sized businesses.

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Thank you.

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