CompTIA Network+ Exam N10-008

Lesson 1

Comparing OSI Model Network Functions

Objectives

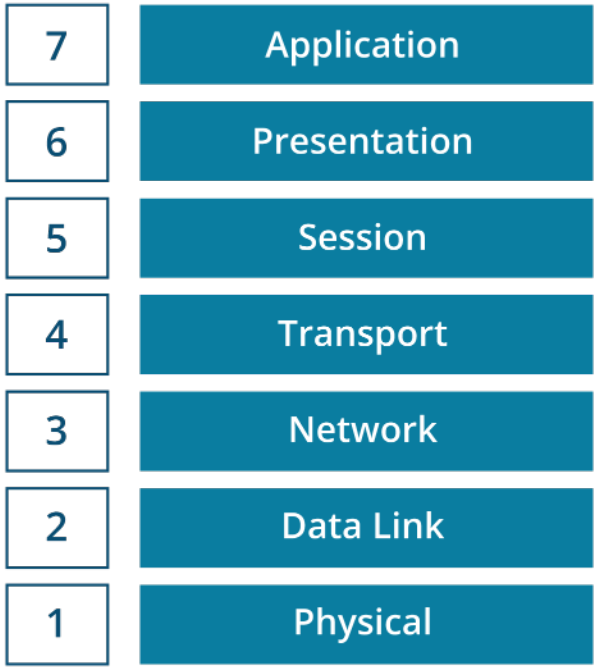
- Compare and contrast OSI model layers
- Configure SOHO networks

Lesson 1

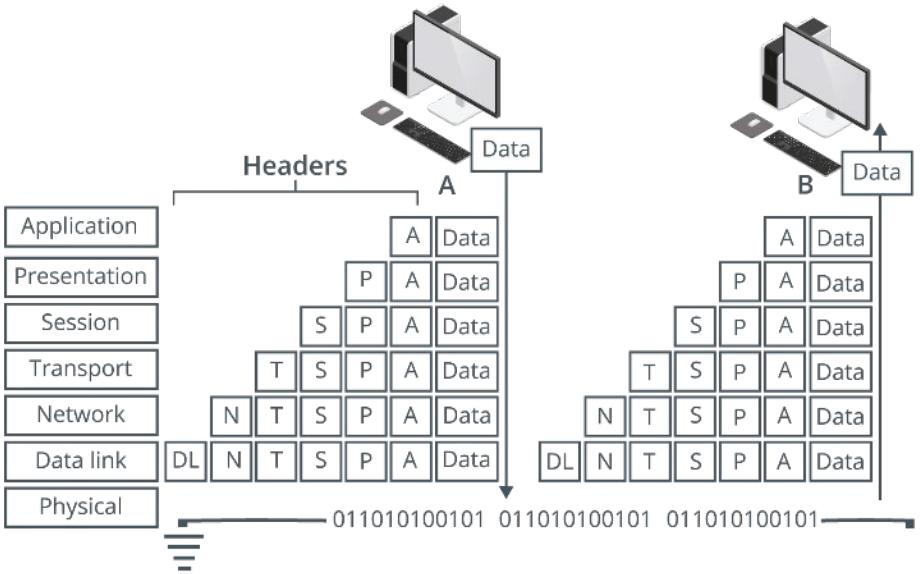
Topic 1A

Compare and Contrast OSI Model Layers

Open Systems Interconnection Model



Data Encapsulation and Decapsulation



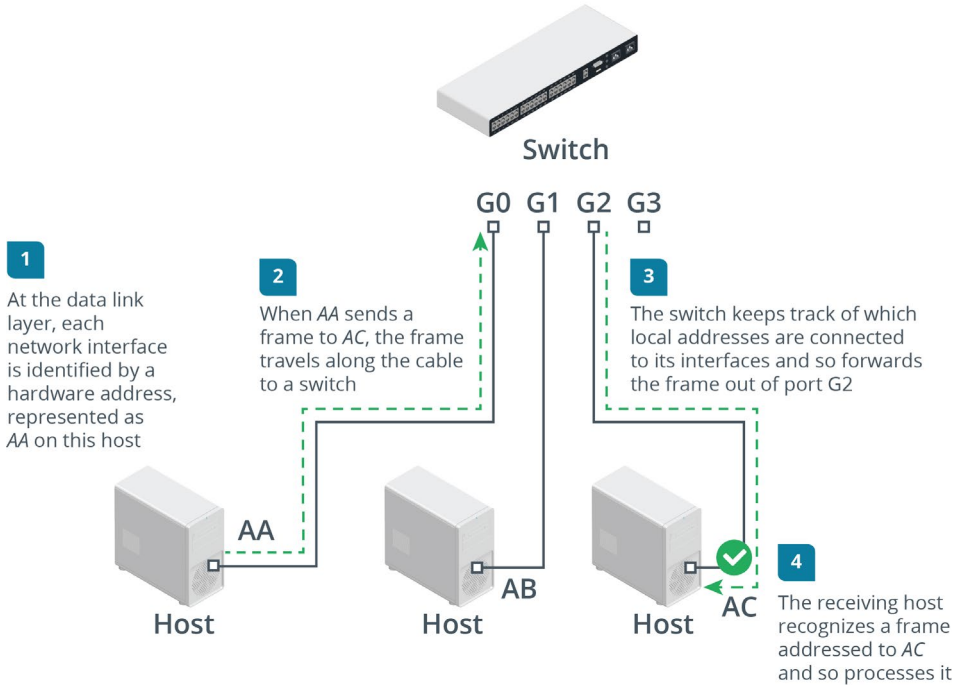
- Network protocol functions
  - Addressing
  - Encapsulation
- Protocol stack
  - Same layer interaction
  - Adjacent layer interaction
- Protocol Data Unit (PDU)
  - Headers
  - Payload/data

Layer 1—Physical

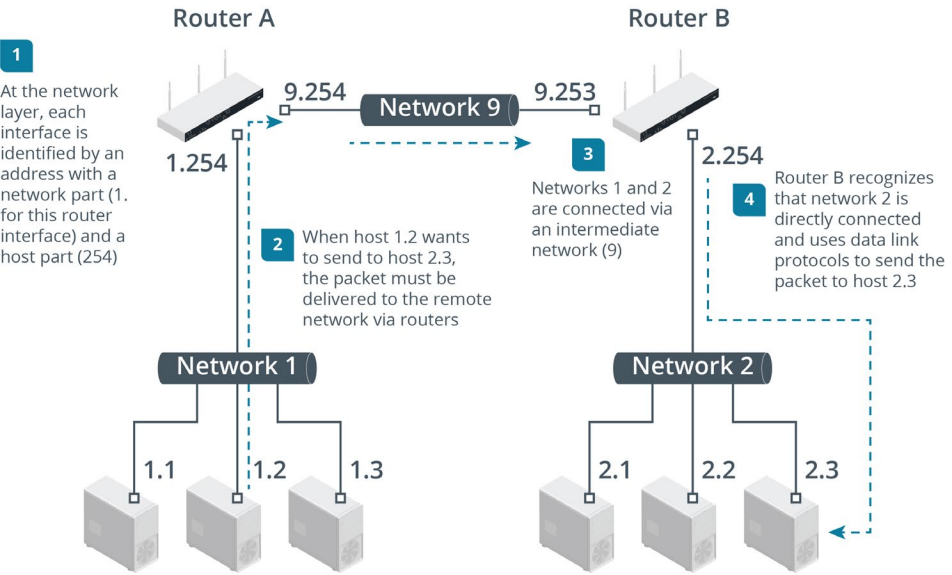
- Physical (PHY) layer transmission media types
  - Cabled
  - Wireless
- PHY layer features
  - Physical topology and segments
  - Physical interface and transmission of signals
  - Modulation and encoding
- Devices working at layer 1
  - Transceiver, repeater, hub, media converter, modem

Layer 2—Data Link

- Exchange PDUs as frames using hardware addresses within local segment
- Logical versus physical topology
- Intermediate systems versus end systems
- Devices working at layer 2
  - Network interface card (NIC), bridge, switch, wireless access point (AP)



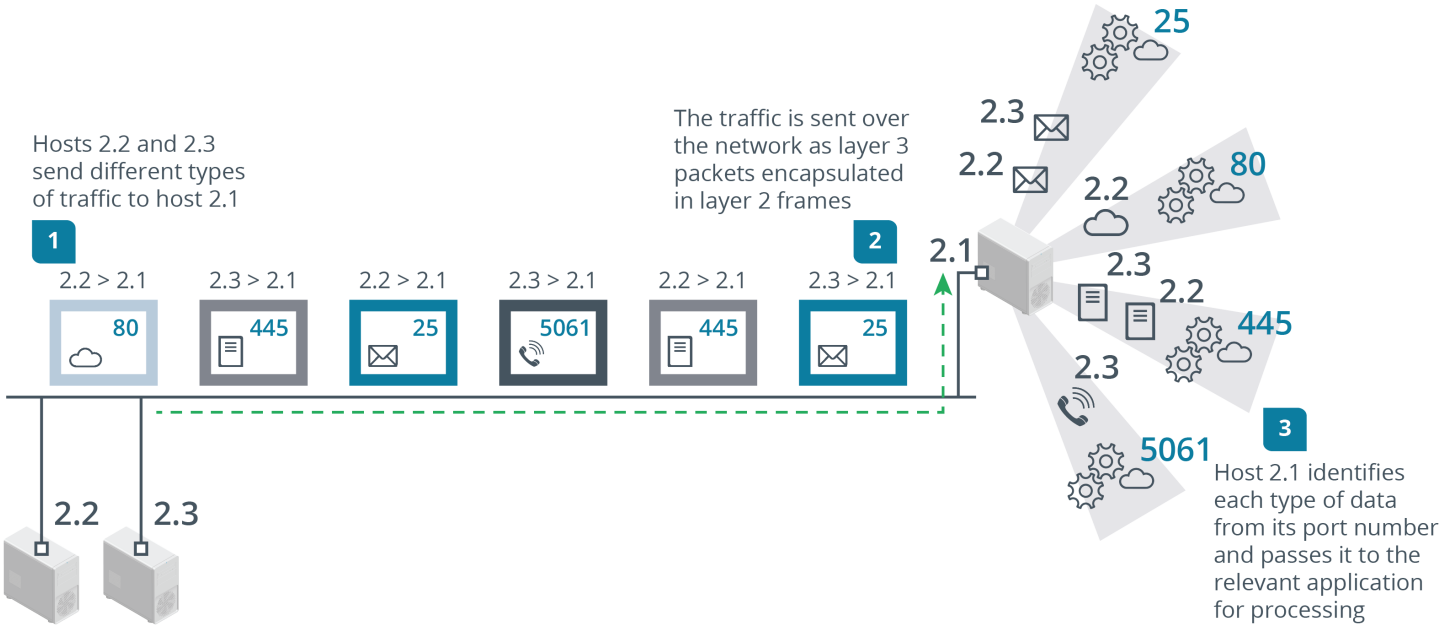
Layer 3—Network



- Network of networks or internetwork
- Forward datagrams/packets via routers using logical network addresses
- Can contain multiple segments using different physical layer specifications and layer 2 protocols
- Devices working at layer 3
  - Router, basic firewall

Layer 4—Transport

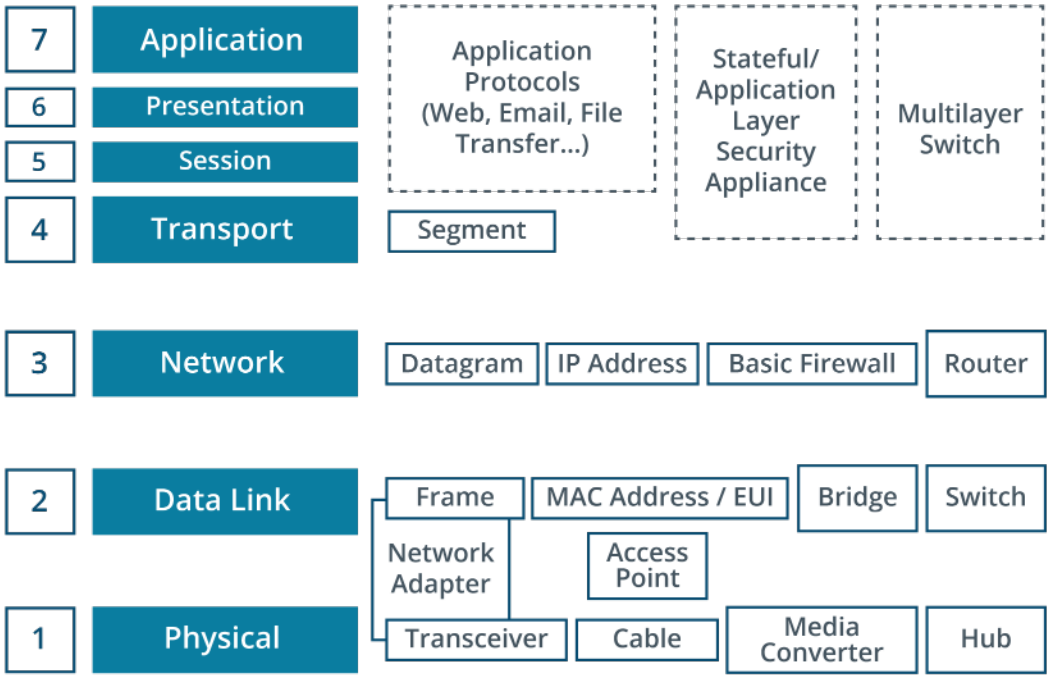
- Identify application data using port numbers
- Load balancer, advanced firewall, intrusion detection system (IDS)



Upper Layers

- Layer 5—Session
  - Establish rules for exchange of messages and sequencing (dialog control)
- Layer 6—Presentation
  - Establish data formats (such as character sets)
- Layer 7—Application
  - Present requests and responses from server or client software with structured headers and data payload

OSI Model Summary



Review Activity: OSI Model Layers

- Open Systems Interconnection Model
- Data Encapsulation and Decapsulation
- Layer 1—Physical
- Layer 2—Data Link
- Layer 3—Network
- Layer 4—Transport
- Upper Layers

Lab Activity

Assisted Lab: Exploring the Lab Environment

- Lab types
  - Assisted labs guide you step-by-step through tasks
  - Applied labs set goals with limited guidance
- Complete lab
  - Submit all items for grading and check each progress box
  - Select “Grade Lab” from final page
- Save lab
  - Select the hamburger menu and select “Save”
  - Save up to two labs in progress for up to 7 days
- Cancel lab without grading
  - Select the hamburger menu and select “End”

Lesson 1

Topic 1B

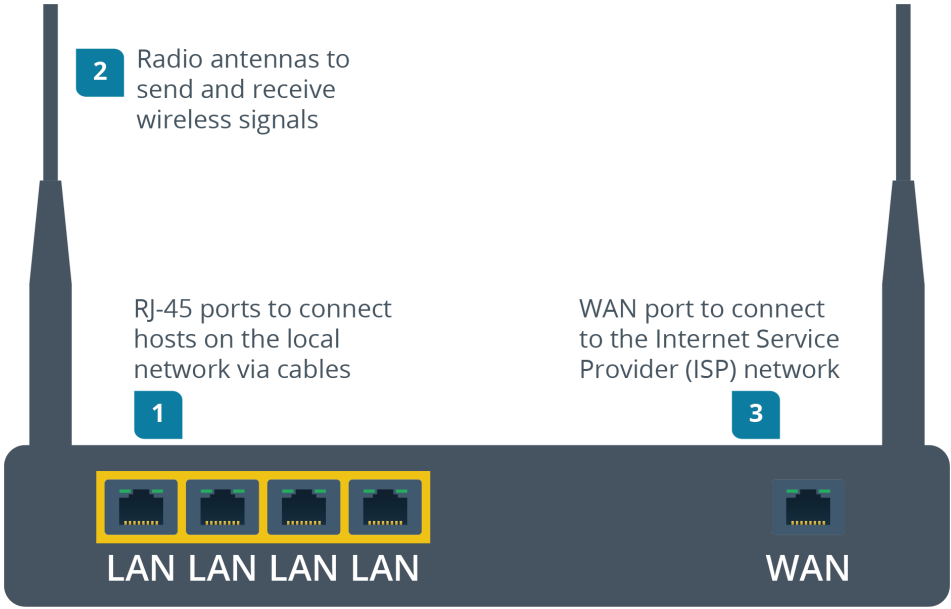
Configure SOHO Networks

SOHO Routers

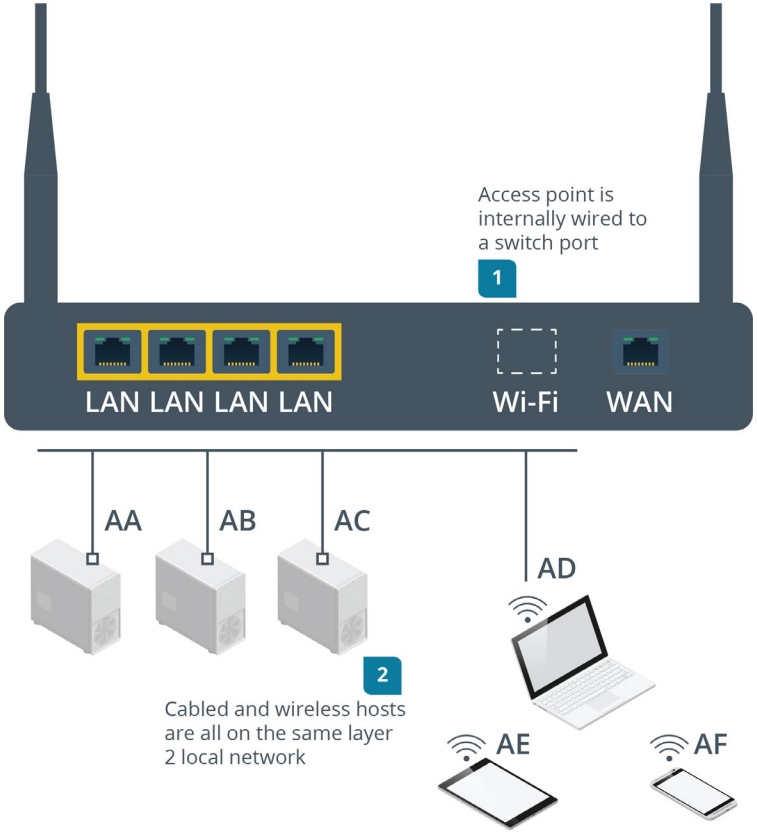
- Local area network (LAN) scope
- Small office, home office (SOHO) category LANs
- Wide area network (WAN) scope
- SOHO router
  - Multifunction network appliance
  - Combine modem, switch, wireless access point, router, firewall
  - Establish a local area network and connect it to the Internet WAN

Physical Layer Functions

- RJ-45 ports for cabled network connections
- Radio antennas for wireless signaling
- Modem for WAN connectivity

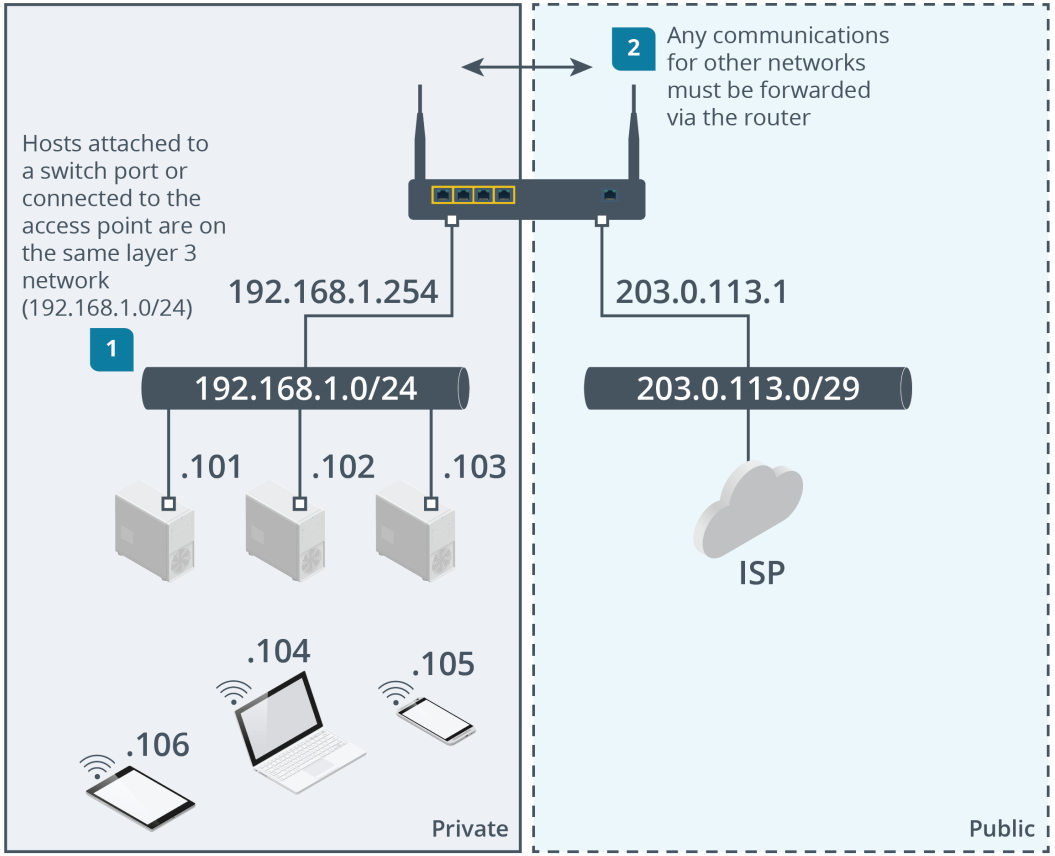


Data Link Layer Functions



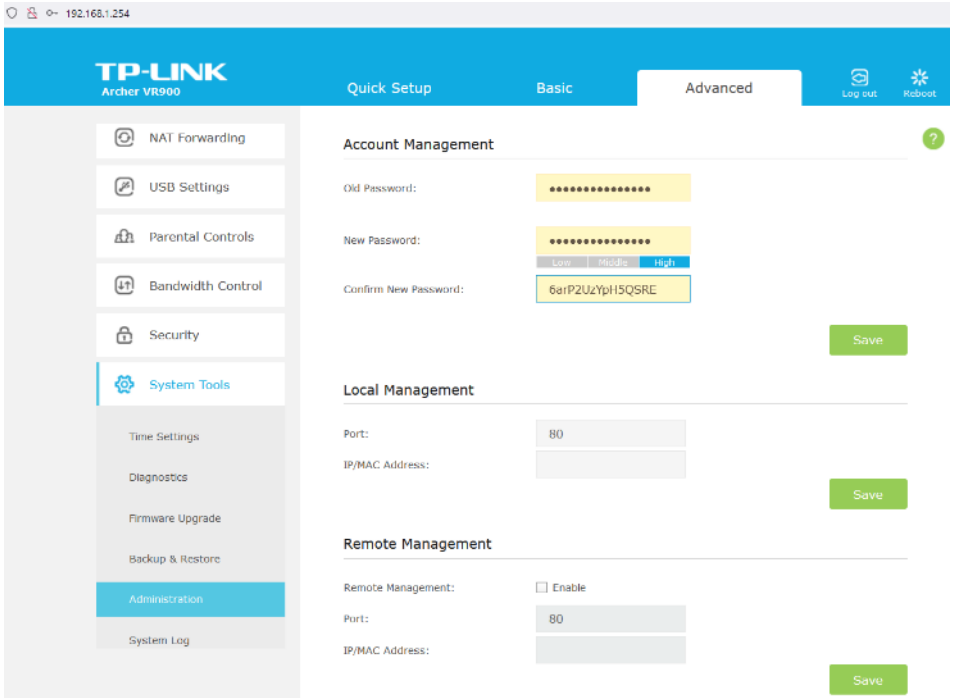
- Ethernet switch
  - Connect the RJ-45 ports
- Wireless access point
  - Implement a Wi-Fi standard
  - Connect stations in a wireless LAN (WLAN)
  - Connected to switch to bridge wired and wireless segments in single data link network
- Media access control (MAC) hardware addresses identify each interface

Network Layer Functions



Transport and Application Layer and Security Functions

- Filtering between public and private zones (firewall)
  - Specify allow/block rules for IP addresses
  - Specify allow/block rules for layer 4 port numbers
- Authenticate access to the wireless network
- Protect the SOHO router management interface



The Internet

- The public switched telephone network (PSTN)
- Internet service providers (ISPs)
- Internet standards and authorities
  - Internet Assigned Numbers Authority (IANA)
    - Manages IP address allocation and namespaces
  - Internet Corporation for Assigned Names and Numbers (ICANN)
  - Regional Internet Registries (RIRs) and ISPs
  - Internet Engineering Taskforce (IETF) and requests for comments (RFCs)

Hexadecimal Notation

- Base numbering systems and place position
  - 255 = (2x10x10) + (5x10) + 5
- Binary/base 2
  - 11111111 = (1x2x2x2x2x2x2x2)+(1x2x2x2x2x2x2)+(1x2x2x2x2x2)+(1x2x2x2x2)+(1x2x2x2)+(1x2x2)+(1x2)+1 = 255
- Hexadecimal/base 16
  - A=10,B=11,C=12,D=13,E=14,F=15
  - FF = 255

Review Activity: SOHO Networks

- SOHO Routers
- Physical Layer Functions
- Data Link Layer Functions
- Network Layer Functions
- Transport and Application Layer and Security Functions
- The Internet
- Hexadecimal notation

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Summary