Chapter 1

Network Models

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Episode 1.01

Episode title: **What is a Model?**

Objective: **1.2 Explain the characteristics of network topologies and network types**

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Key Terms

- No key terms for this episode
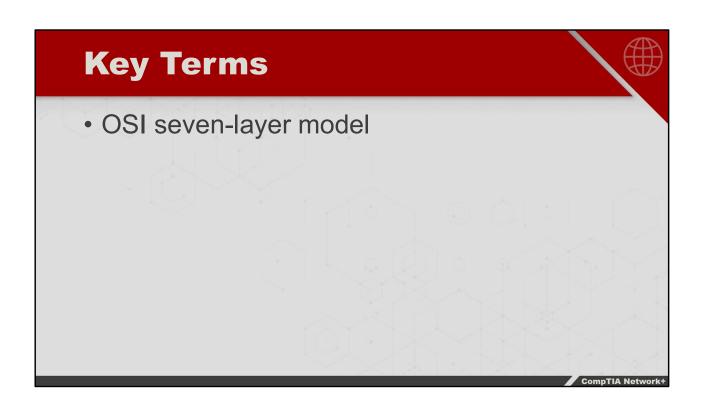
Quick Review

- Models are used as basic representations to help understand more complex ideas

- Network models help explain different networking concepts in simplified ways
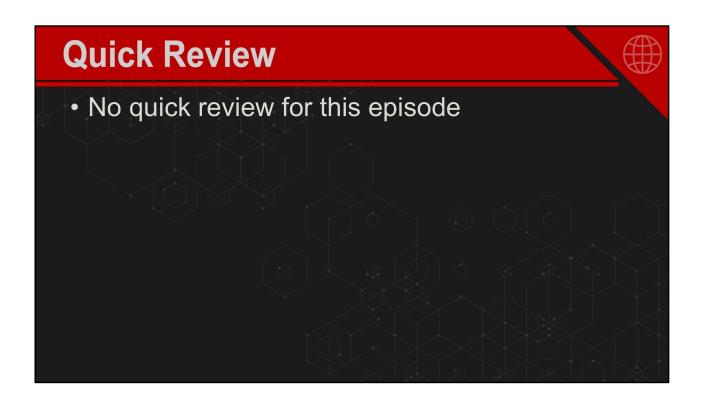
Episode 1.02

Episode
title: **The OSI Model**

Objective: **1.1 Compare and contrast the Open Systems
              Interconnection (OSI) model layers and
              encapsulation concepts**

Key Terms

- OSI seven-layer model

Quick Review

- No quick review for this episode

Episode 1.03

Episode title: **Meet the Frame**

Objective: **2.1 Compare and contrast various devices, their features, and their appropriate placement on the network**

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Key Terms

- Network interface card (NIC)
- Hub
- Frame vs. packet
- Packetized data

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Quick Review

- Devices on a network send and receive data in discreet chunks called frames (or packets)
- Frames are a maximum of 1500 bytes in size
- Frames are created and destroyed inside the network interface card (NIC)

Episode 1.04

Episode title: **The MAC Address**

Objective: **1.1 Compare and contrast the Open Systems Interconnection (OSI) model layers and encapsulation concepts**

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Key Terms

- Repeater
- The frame payload does not identify the destination
- Media access control (MAC) address
- Physical address = MAC address
- Original equipment manufacturer (OEM)
- Unique ID
- Cyclic redundancy check (CRC)

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Quick Review

- A MAC address is a unique 48-bit identifier for a NIC
- Frames have destination and source MAC addresses
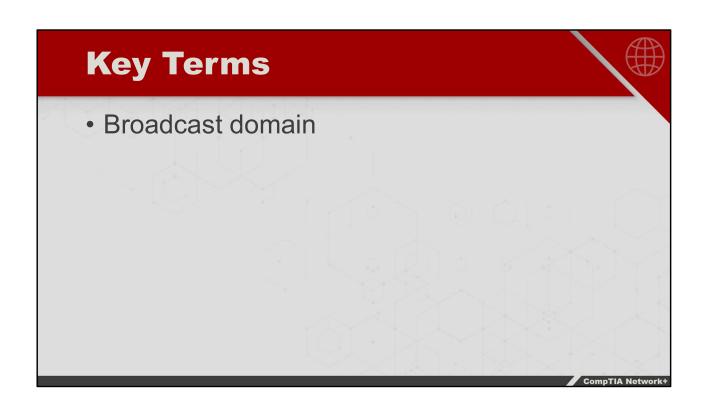- NICs use MAC addresses to decide whether or not to process a frame

Episode 1.05

Episode title: **Broadcast vs. Unicast**

Objective: **1.4 Given a scenario, configure a subnet and use appropriate IP addressing schemes**

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Key Terms

- Broadcast domain

Quick Review

- A unicast transmission is addressed to a single device on a network
- A broadcast transmission is sent to every device in a broadcast domain
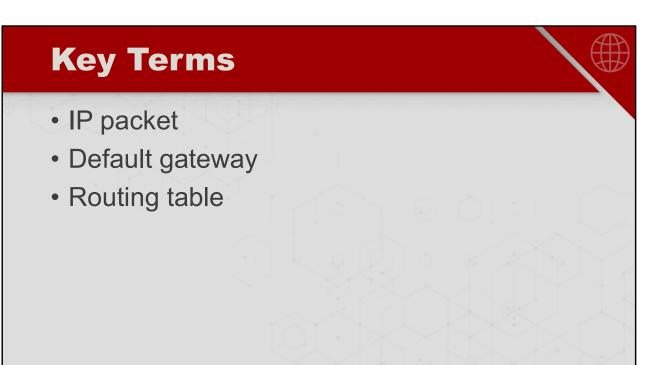- A broadcast address looks like this:

  FF-FF-FF-FF-FF-FF

Episode 1.06

Episode title: **Introduction to IP Addressing**

Objective:
1.1 Compare and contrast the Open Systems Interconnection (OSI) model layers and encapsulation concepts

2.1 Compare and contrast various devices, their features, and their appropriate placement on the network

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Key Terms

- Logical addressing
- IP addressing
- IPv4 31.44.17.231
- IPv4 31.44.17.231
- IPv4 31.44.17.231   IPv4 110.14.56.5
- Router

Key Terms

- IP packet
- Default gateway
- Routing table

Quick Review

- An IPv4 address looks like this: 31.44.17.231
- A router connects multiple local area networks (LANs)
- The IP packet within the frame never changes

Episode 1.07

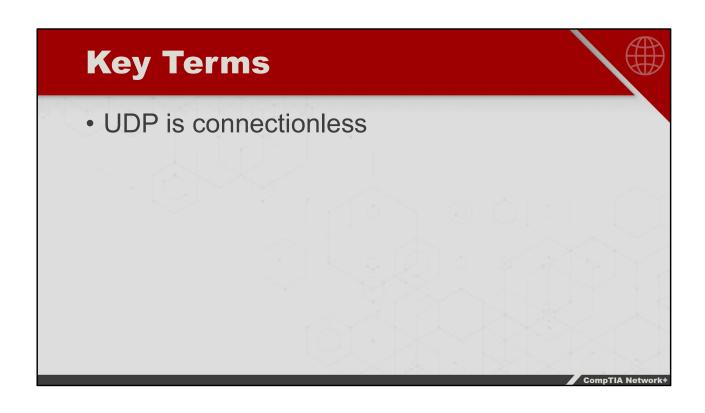Episode title: **Packets and Ports**

Objective: **1.5 Explain common ports and protocols, their application, and encrypted alternatives**

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Key Terms

- Port numbers
- Range is 0-65535
- Transmission Control Protocol (TCP)
- TCP is a connection-oriented conversation
- Sequencing number
- Acknowledgement number
- User Datagram Protocol (UDP)

Key Terms

- UDP is connectionless

Quick Review

- Port numbers help direct packet traffic between the source and destination
- Packets have sequence numbers so the network software can reassemble the file correctly
- TCP is connection-oriented, UDP is connectionless