

CCNA Textbook Notes

By Dave Cappelli
2/14/11

Objective:

Upon starting my position as an Associate Systems Engineer at Cisco, I will have to complete my CCNA certification. To get a head start on this, I will be reading the CCNA textbook provided to me by Professor Matthews. As I read the book, I will be taking notes and writing down the questions I have in this file. All of this preparation will pay off when I start the job and have to take the CCNA certification exams.

Chapter 1: Computer Basics

Computer Hardware

- Gives a basic overview of the computer's hardware
- Network Interface Card (NIC)
 - Designed as a Ethernet card, a Token Ring card, or a Fiber Distributed Data Interface card
 - Requires an Interrupt Request Line (IRQ), an I/O address, and an upper memory address to work with the operating system
 - IRQ is a signal informing a CPU that an event which needs its attention has occurred.

Computer Software

- Overview of web browsers, Plug-ins, binary number system, binary number math

Networks and Networking

- Discusses the history of networks, digital bandwidth

This chapter contained very basic information and all of it I have learned in various other classes here. No questions on this material.

Chapter 2: The OSI Model

Purpose of OSI Model

- Accelerates the development of future networking products.
- Enhances interoperability and comprehension

- Facilitates the standardization of network components to allow multiple vendor development and support
- Prevents changes in one layer from affecting other layers
- Breaks network communication into smaller parts making it easier to understand

Seven Layers

- The seven layers are:
 - Layer 7: Application
 - Layer 6: Presentation
 - Layer 5: Session
 - Layer 4: Transport
 - Layer 3: Network
 - Layer 2: Data Link
 - Layer 1: Physical
- Layers 5-7 are the Application (or Upper) Layers
 - Deal with user interface, data formatting, and application access
- Layers 1-4 are the Data Flow Layers
 - Control physical delivery of data

Layer 7: Application

- User Interface, Browsers
- Closest layer to user, provides network services like file access and printing to the user's application
- Does not provide services to any other OSI layer, just to applications outside the OSI
- Examples: Telnet, HTTP

Layer 6: Presentation

- Common data format
- Determines how data is presented
- Special processing such as encryption and compression
- Translates between formats to make sure application data can be read by other systems
- Examples: ASCII, JPEG

Layer 5: Session

- Dialogues and conversations
- Keeps different applications data separate
- Establishes, manages, terminates sessions between hosts
- Synchronizes dialogue between the two host's presentation layers
- Examples: Operating System, Application Access Scheduling

Layer 4: Transport

- Flow Control and Reliability
- Segments data from sender and reassembles them on receiver.
- Shields the upper layers from transport implementation details

- The amount of reliability in the transport is negotiated here
- Establishes, maintains, and terminates connection-oriented circuits
- Examples: TCP, UDP

Layer 3: Network

- Path selection, routing, and logical addressing
- Provides connectivity and path selection between two host systems that might be on two geographically separated networks
- Examples: IP addresses

Layer 2: Data Link

- Frames and media access control
- Provides transit across a physical link
- Concerned with physical addressing, network topology, network media access, and error detection
- Examples: Ethernet, 802.3...

Layer 1: Physical

- Signals and media
- Defines the electrical, mechanical, procedural, and functional specifications for activating, maintaining, and deactivating the physical link between end systems
- Characteristics such as voltage level, timing of voltage changes, physical data rates, max transmission distances, physical connectors, and others
- Examples: Ethernet, V.35?????

TCP/IP Model

Military defined layers which were originally used to create the internet

- Application Layer
- Transport Layer
- Internet Layer
- Network Access Layer

Has comparable transport and network layers to the OSI model. Fewer layers in the TCP/IP model make it more complex to work with. OSI model used since it is easier to learn on yet the networks of the world typically fit the TCP/IP model more.

Chapter 3: Local-Area Networks

First it discusses the various LAN topologies that can be created. Next, Network Interface Cards (NICs) are discussed.

- **Question: the book says on page 83 that CAT 5 UTP is the most common media in network installations - is this still true?**
- Repeaters are used to extend the range which data can be transported over a media (like CAT5 which has a range of 100 meters).

- They are layer 1 devices since they only deal with bits.
- Hubs are the next devices discussed. When one device transmits on a hub, all other devices hear it.
 - Also known as a multi-port receiver