

INTERNETWORKING II

Chapter 1 Study Guide

What is the definition of an enterprise?

a corporation, agency, school, or other organization that ties together its data, communication, computing, and file servers.

Name the reasons for creating a layered model to describe networking functions:

- **to make less complex elements**
- **to define standards for compatibility**
- **to develop modular functions**
- **to promote symmetry and interoperability**
- **to promote quicker evolution**
- **to make difficult concepts easy to understand and learn**

What does the Application layer do?

provides network services to user applications; supports the communicating components of an application.

What does the Presentation layer do?

provides data representation and code formatting. It also is responsible for encryption.

What does the Session layer do?

establishes, maintains, and manages sessions between applications

Name some of the applications/protocols supported by the Session layer:

- **Network File Systems (NFS)**
- **Structured Query Language (SQL)**
- **Remote-Procedure Call (RPC)**
- **X Window System**
- **AppleTalk Session Protocol (ASP)**
- **DNA Session Control Protocol (DNA SCP)**

What does the Transport layer do?

segments and reassembles data into a data stream.

What does the Network layer do?

path selection (determines best way to get data to destination)

What does the Data Link layer do?

concerned with network topology

What does the Physical layer do?

provides the electrical, mechanical, procedural, and functional means for activating and maintaining the physical link between systems.

What are the layers that make up the Host layers?

Application, Presentation, Session, Transport

What are the layers that make up the Media layers?

Network, Data Link, Physical

What is a PDU? What is the PDU for the Data Link layer?

Protocol Data Unit – information exchanged by protocols. PDU for Data Link is the frame.

List the encapsulation header for each of the following layers:

Application-Session: **Data**

Transport: **Segments**

Network: **Packets**

Data Link: **Frames**

Physical: **Bits**

What is the definition of a router?

a networking device provides internetworking functionality and broadcast control.

What is the definition of an Ethernet switch?

a networking device that offers full-duplex, dedicated bandwidth to all segments or desktops

What are the 3 most common LAN technologies used today?

Ethernet, Token Ring, FDDI

What cable(s) allow(s) segments up to 185 meters?

10-Base 2, 10-Base 5, Multi-mode fiber, Single-mode fiber

What cable(s) allow(s) segments up to 100 meters?

10-Base T, 10-Base2, 10-Base 5, Multi/Single-mode fiber

What cable(s) allow(s) segments up to 500 meters?

10-Base 5, Multi/Single-mode fiber

What cable(s) allow(s) segments up to 3000 meters?

Single-mode fiber

What is the IEEE number for Ethernet?

802.3

What does CSMA/CD stand for? What type of LAN technology uses CSMA/CD?

Carrier Sense Multiple Access/Collision Detect. Ethernet

What happens when a collision occurs on a network?

data in both packets is destroyed. When the transmitting node recognizes the collision, it issues a jam signal.

What does a jam signal do?

it is a signal to all devices on the network/segment to stop transmitting.

What is a backoff?

it is a certain amount of time that a device is stop transmitting on the network. Each device has a different backoff so they will start transmitting again at different times. This, hopefully, keeps other collisions from happening.

What is the network broadcast address in hex?

FF-FF-FF-FF-FF-FF

MAC addresses can be divided into 2 pieces. What are they, and how many bits are in each piece?

Vendor code: 24 bits

Serial number (unique number to each card): 24 bits

What is ARP? What does it do?

Address Resolution Protocol. It is how a sending device can get the MAC address of the destination device. The sending device must know the IP number of the destination for ARP to work.

If a device sends out an ARP request, what will send back the ARP reply? What will send back the ARP reply if the requested device is not on the same segment, and what does it reply with?

Only the device that has the IP address referenced in the ARP request will send back an ARP reply (with its MAC address) to the sending device.

If the destination device is not on the same segment as the sending device, then the router will send back the ARP reply. It will include its own MAC address (instead of the actual destination device's) in the ARP reply.

Subnet the following Class C address:

Address: 197.85.16.3

Actual Subnets needed: 8

Number of bits to borrow: 4

Number of actual hosts per subnet: 16

Subnet Mask: **255.255.255.240**

Network No.	First Host No.	Last Host No.	Broadcast No.
197.85.16.0	197.85.16.1	197.85.16.14	197.85.16.15
197.85.16.16	197.85.16.17	197.85.16.30	197.85.16.31
197.85.16.32	197.85.16.33	197.85.16.46	197.85.16.47
197.85.16.48	197.85.16.49	197.85.16.62	197.85.16.63
197.85.16.64	197.85.16.65	197.85.16.78	197.85.16.79
197.85.16.80	197.85.16.81	197.85.16.94	197.85.16.95
197.85.16.96	197.85.16.97	197.85.16.110	197.85.16.111
197.85.16.112	197.85.16.113	197.85.16.126	197.85.16.127
197.85.16.128	197.85.16.129	197.85.16.142	197.85.16.143
197.85.16.144	197.85.16.145	197.85.16.158	197.85.16.159
197.85.16.160	197.85.16.161	197.85.16.174	197.85.16.175

What is the difference between *actual* and *useable* subnets?

Actual subnets is how many total subnets are created by borrowing bits. Useable are the actual subnets less 2. The reason for this is that you can't use the whole first subnet (it's reserved for the network address) or the last subnet (it's reserved for network broadcast).

What is the difference between TCP and UDP? What layer do they both exist at?

TCP has error control built into it (connection oriented); UDP does not (connectionless). They are both Layer 4 protocols.

What is windowing?

an agreement between the sending device and the destination device on how much data can be sent at a time. It is an error control technique that helps TCP's reliability.