

Data Communications CS420/520
Fall 1999

Axel Krings, PhD

Final Exam

Name: _____ Student ID: _____

This is an *closed* book, *closed* note exam. You may use a calculator but **no computers**. Show **ALL** your work to get full or partial credit for the problem. You have 2 hours, even though the exam was designed to take only one hour.

Make sure you have **8 questions!** Notice the distribution of points!

Problem	Total	-Points
1	13	
2	13	
3	14	
4	11	
5	15	
6	14	
7	12	
8	8	
Total:	100	

1. (13 pts) With respect to (DoD) IP, TCP and UDP

a) (4) Name and describe 3 fields in the IP header (Source/Destination Address counts as 1 ☺):

b) (4) IP uses 32 bit addresses. What are the characteristics for Class A, B and C networks?

c) (3) The first entry in the TCP header is the port address. What is a port?

d) (2) Which of the two, TCP or UDP, is the reliable transport service?

3. (14 pts) With respect to ATM:

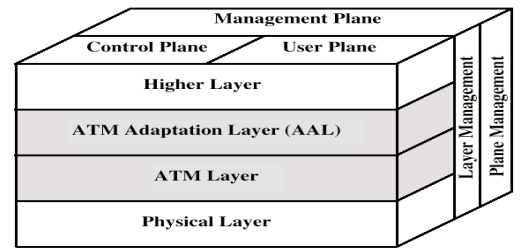
a) (4 pts) What is a Virtual Channel and a Virtual Path? Also, describe their relationship.

b) (3 pts) What is the total frame size (in octets), how much of that is used for data?

c) (4 pts) What is the difference between lossy vs. lossless compression?

d) (3 pts) What data transfer rates are possible with ATM?

4. (11 pts) The ATM layer structure is shown:
- a) (3 pts) What does the ATM layer do?

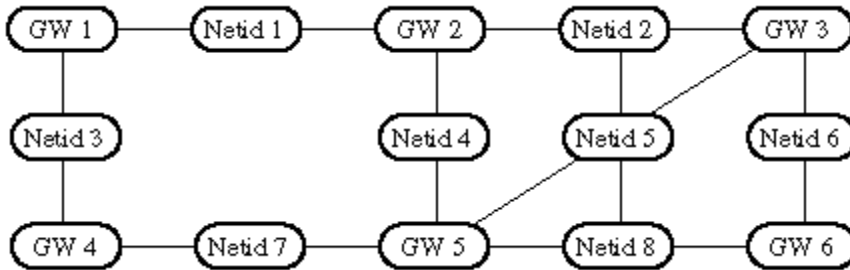


- b) (4 pts) What is the adaptation layer (AAL) and why do we need it?

- c) (4) Describe the features/function of two AAL types. (AAL3/4 counts as one).

5. (15 pts) Circle the correct response(s). (Note that **there might be more than one correct answer** - so indicate all of them). Each part is worth 3 points.
- a) Which statements about ATM are true?
- i) The frame sizes vary between 512 and 64k bits
 - ii) All frames have the same size
 - iii) LAN Emulation and IP over ATM support internetworking with legacy LANs
 - iv) The network switch is an integral part of the ATM design
 - v) Virtual Paths are the same as Virtual Circuits.
 - vi) None of the Above
- b) The internet architecture includes?
- i) Exterior gateways
 - ii) Interior gateways
 - iii) Subnet routers
 - iv) Networks
 - v) Subnetworks
 - vi) All of the above
- c) What describes the features of a smart hub:
- i) Ethernet switching
 - ii) Internet fragmentation
 - iii) Managed ports
 - iv) Security features
- d) What protocol(s) address multi-service (multimedia):
- i) FDDI-II
 - ii) ATM
 - iii) TCP
 - iv) None of the above
 - v) All of the above
- e) Which of the following is true about FDDI-II:
- i) FDDI and ISDN are basically identical
 - ii) It uses time-division multiplexing
 - iii) Each channel can support asynchronous and isochronous data
 - iv) There can be more than 1 "frame" circulating at a given time.
 - v) FDDI is a broadcast network.

7. (12 pts) Assume the following network with 6 gateways. Given the initial routing tables of all gateways (the entries in the table contain the netid, the distance and gateway), what are the entries in Gateway GW1, GW2 and GW4 after one exchange of table-updating messages? Next, what is the final table for GW1 after a second message exchange?



Netid	D,G
1	0,1
3	0,1

Netid	D,G
1	0,2
2	0,2
4	0,2

Netid	D,G
2	0,3
5	0,3
6	0,3

Netid	D,G
3	0,4
7	0,4

Netid	D,G
4	0,5
5	0,5
7	0,5
8	0,5

Netid	D,G
6	0,6
8	0,6

--	--

--	--

--	--

--	--

