

Name:

CS461, Midterm  
Spring 2004  
Mar 10, 2004

Pledge:

Directions:

- Please answer each question in the space provided. The amount of space should be sufficient for a correct answer. If you need more space, please use the backs of pages, and make a note to that effect. If you run out of space, exam books are provided at the front of the room.
- This exam is closed-book, closed-notes, and is covered by the Honor Code. Please write and sign the pledge after you finish your exam.
- There are a total of five sections, with the number of points for each shown by the question. While it is not the intent for the exam to be a race, spending too much time on a single question may preclude finishing the exam. Budget your time wisely.
- To be fair, I will try to avoid answering content-related questions during the exam, unless it's to correct a mistake on my part.
- If you feel that a question **requires** additional assumptions or information to answer, please state them. Your guiding principle should be *Occam's razor*, which loosely translated states that you should allow as few assumptions as necessary to explain the situation.
- Unless otherwise stated/implied, assume a C-like language running on a Unix-like operating system.
- Please first read over the entire exam and then begin to answer questions. I will wait outside the exam room for the first five minutes, and then will be available in my office (room 322).
- Please write legibly



2. Short Answer (15pts) Answer each item *well* in no more than 3 sentences.

- What is a distance vector protocol?

- What is 4B/5B?

- What affects the size of the advertised window?

- What is Silly Window Syndrome?

- What is Nagle's algorithm?

3. ISO layers (15pts)

Bridges, switches, and routers are three types of devices that one may expect to find along the communication paths of two end hosts. For each device:

- Using names or numbers, state at which layer in the ISO protocol does the device operate. Explain why.
- Where applicable, give an example of actions that this kind of device performs that cannot be handled by the immediately simpler device.
- Explain the kinds of information stored on the device and how that information gets there.

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4. IP and friends (20pts)

- Explain how IP addresses were initially organized

- Explain subnetting. What changes did subnetting introduce? Where were they visible?

- Explain CIDR. What changes did CIDR introduce? Where were they visible?

- Explain how ARP (Address Resolution Protocol) traffic on a network was affected (if it was affected at all) by subnetting and CIDR.

5. Wired versus wireless (15pts)

Compare data transmission in the wired (assume Ethernet) and wireless (assume IEEE 802.11) worlds. In particular, describe salient differences in when hosts can transmit, collision behavior, physical media, and any other factors you deem relevant.

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