

## CS 485/ECE 440/CS 585 Fall 2017 Homework 5

This will not be graded, or turned in to me. You may work in groups. I recommend getting it done before Wednesday, November 15<sup>th</sup>, and emailing your answers to the TA ([adnanbashir@unm.edu](mailto:adnanbashir@unm.edu)) to be checked.

1. Assuming a subnet mask of 255.192.0.0, which of these IP addresses is NOT on the same subnet as 67.89.34.12?:

A. 67.89.127.253      B. 67.99.134.253      C. 67.199.34.13      D. 67.89.1.1

2. Assuming a /10 subnet, which of these IP addresses is NOT on the same subnet as 67.89.34.12?:

A. 67.89.127.253      B. 67.99.134.253      C. 67.199.34.13      D. 67.89.1.1

3. Roughly how many IP addresses are there in a /24 subnet?

A. 256                      B. 4096                      C. 16,348                      D. 262,144

4. If machine A wants to send a packet to a machine on another subnet, B, through gateway router C, which of these would I expect to find in the IP (*i.e.*, network layer) header of the packet sent by A?

- A. C's IP address
- B. C's Ethernet address (a.k.a. MAC address)
- C. B's Ethernet address (a.k.a. MAC address)
- D. A's IP address

5. If machine A wants to send a packet to a machine on another subnet, B, through gateway router C, which of these would I expect to find in the Ethernet (*i.e.*, link layer) header of the packet sent by A?

- A. C's IP address
- B. C's Ethernet address (a.k.a. MAC address)
- C. B's Ethernet address (a.k.a. MAC address)
- D. A's IP address

6. Which of these is a property of a typical datagram socket over UDP, but not of a typical stream socket over TCP?

- A. Connection oriented
- B. Sequenced, meaning all bytes arrive in order
- C. The datagrams have record boundaries
- D. Bi-directional and full-duplex

For questions 7 through 10, please refer to the following system call trace excerpts from a single server process...

```

---snip---
socket(PF_INET, SOCK_STREAM, IPPROTO_IP) = 3
bind(3, {sa_family=AF_INET, sin_port=htons(644),
sin_addr=inet_addr("0.0.0.0")}, 16) = 0
listen(3, 10) = 0
accept(3, 0, NULL) = 4
...
write(4, "Sat Sep 21 13:53:33 2013\r\n", 26) = 26
close(4) = 0
...
accept(3, 0, NULL) = 4
stat("/etc/localtime", {st_mode=S_IFREG|0644, st_size=2427, ...}) = 0
write(4, "Sat Sep 21 13:54:45 2013\r\n", 26) = 26
close(4) = 0
---snip---

```

7. What port does the server listen on?:

- A. 3                      B. 4                      C. 5000                      D. 644

8. What is the file descriptor number (*i.e.*, the index in the file descriptor table) for the listening socket?

- A. 1                      B. 2                      C. 3                      D. 4

9. What is the file descriptor number (*i.e.*, the index in the file descriptor table) for the first client connection socket?

- A. 1                      B. 2                      C. 3                      D. 4

10. What type of socket is being used ?

- A. Datagram              B. Stream                      C. Raw                      D. Hexnut

11. In which of these data structures inside a typical Linux kernel would I expect to find a number that a process uses to tell the kernel which socket a particular system call (*e.g.*, listen() or write()) should operate on:

- A. The ARP cache
- B. The IP routing table
- C. A file descriptor table for a process
- D. An inode cache

12. Which of these statements is NOT true about distance vector routing?
- A. Poison reverse can help against the *count to infinity* problem
  - B. The routing algorithm we used for our class network this semester (RIP) is a distance vector algorithm
  - C. In a distance vector routing algorithm, each node gets a complete picture of the network before it performs any routing calculations
  - D. Distance vector routing is a dynamic routing protocol
13. TCP congestion control (circle the best ending to this sentence)...
- A. ...is a way to stop the sender from overwhelming the receiver
  - B. ...is a failed idea that was dropped early in the Internet's development.
  - C. ...is a way to help prevent network congestion in TCP/IP networks.
  - D. ...is only applicable to vehicular networks.
14. TCP flow control (circle the best ending to this sentence)...
- A. ...is a way to stop the sender from overwhelming the receiver
  - B. ...is a failed idea that was dropped early in the Internet's development.
  - C. ...is a way to help prevent network congestion in TCP/IP networks.
  - D. ...is only applicable to vehicular networks.
15. Which of these does SSL/TLS NOT provide?
- A. Authentication
  - B. End-to-end encryption
  - C. Secure key exchange
  - D. Protection against attacks by the server you're connecting to
16. Which of these things does a typical TCP congestion control algorithm need to continuously estimate?
- A. Round-trip-time (RTT)
  - B. IP checksum
  - C. HTTP compression rate
  - D. The speed of light

17. What is the main difference between TCP Reno and TCP Tahoe?
- A. One prevents overloading the network, the other the receiver
  - B. One used distance vector routing, the other link statements
  - C. One has fast recovery, the other goes back to slow start
  - D. One is a congestion control algorithm, then other a flow control algorithm
18. Which of these is NOT a goal of a typical TCP congestion control algorithm?
- A. Fairness
  - B. Not wasting resources
  - C. Using all available bandwidth
  - D. Increasing the round-trip time (RTT) of the connection