

CIS3360: Security in Computing (online session, Spring 2012)

Homework 1 (assigned 01/22, due on webcourse by 3am 02/02)

Question 1 to 3 should be submitted to Assignment 1.1

1. (32 points) Knowledge-based Question:

- a. How many layers are used in defining Internet protocol stack? Please give their names from the top layer to the bottom layer.
- b. What is the size of TCP packet header? Size of UDP packet header? What layer do they belong to?
- c. Each TCP connection is uniquely identified by what four terms? What is the smallest and largest value for each of the term?
- d. Which company is allocated with 3.0.0.0/8 IP block? Which organization is allocated with 18.0.0.0/8 IP block? How many IP addresses are contained in each of the above IP block?
- e. What are the full names of NAT, DHCP? What are their mainly usages?
- f. Why a TCP packet needs to contain both Sequence number and Acknowledge number? What are these two values used for?
- g. What is the major differences between TCP and UDP? Why DNS uses UDP instead of TCP for its service?
- h. What do "C.I.A" and "A.A.A" represent in computer security according to our textbook?

2. (12 points) Use online IP location services to find out where are these computers (identified by their IP addresses) located (in terms of "city"), please indicate what website you have used for this lookup:

- a. 128.119.40.12
- b. 218.104.71.168
- c. 72.21.194.1
- d. 131.111.8.46

3. (12 points) There are three blocks of IP space are reserved for private networks.

- a. Represent these three IP blocks using x.x.x.x/n format.
- b. What private address block has UCF internal network used? (I explained in lecture)
- c. How many IP addresses are contained in each of these three IP blocks?

Question 4 to 5 should be submitted to Assignment 1.2

4. **(20 points)** Why most websites require users to choose passwords that must have some numbers or some non-alphabetic symbols? If a four-character password uses only English alphabet (no distinguishing on upper-case or lower-case), how many possible passwords exist? If the four-character password uses combination of English alphabet and number 0 to 9, how many possible passwords exist?
5. **TCP protocol and network traffic (22 points)**
Suppose the TCP packet transmission between host A and host B (or a client and a server) follow the following scenarios, fill in the missing sequence number and ack number (for the TCP connection setup scenario, fill in the flag as well).

