Uppsala Universitet

Avd. för Datorteknik (DoCS)

17 Januari 2002

Datakom (DV 1)

Datakommunikation

INSTRUCTIONS TO CANDIDATES

- This is a FIVE (5) hour examination
- Answer all questions
- Questions can be answered in English, Swedish or French.
- Dictionaries are Permitted
- Marks total 50.
- Grade allocation, 0–29 = U, 30–40 = G, 40–50= VG

Question 1

    a. Describe the major responsibilities of the Transport and Network layers of the TCP/IP communication stack. Name at least two major protocols that are used at each level.

[5]

    b. What is the purpose of the Slow Start algorithm? Explain how the Slow Start algorithm is used in conjunction with TCP.

[4]

    c. Describe a simple framing protocol that was discussed in the lectures and comment on why framing is used and at what level of the TCP stack you would expect framing to be used.

[4]

Question 2

Identify and define the ideas which are central to two major issues in computer network security. Provide a brief overview (about half a page) on the approaches that might be taken to solve the problems/issues that you discussed.

[6]

Question 3

Derive a petri net model for mutual exclusion and show by deriving a reachability tree that the model you have derived is correct. That is, mutual exclusion can never be violated.

[7]

Question 4

Draw a detailed diagram that shows the sequence of packets exchanged by the end points during the TCP connection establishment phase (3-way-handshake). Explain what types of packet loss can occur during the process and how the communicating hosts recover in each situation.

[5]

Question 5

Sliding window data exchange is typically implemented at two levels of the stack. Where? Why is sliding window used in two places, what is the objective of using sliding window in each case.

[4]

Question 6

Define the role of each of the following in terms of what they actually do as well as their use when setting up networks. In particular discuss when to chose to use a bridge vs a router.

- repeater/hub

- bridge

- switch

- router

[9]

Question 7

Discuss the idea of RTT (Round Trip Time). Define the basic concept, and then discuss some of the problems that can arise and the attempts that have been made to solve those problems.

[6]