

PRINCE OF SONGKLA UNIVERSITY  
FACULTY OF ENGINEERING

Final Examination Semester I : Academic Year : 2002  
Date : 27 September 2002 Time : 9.00 – 12.00 Room : R300  
Subject : 240 - 361 Computer Networks

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**Instruction:**

- Make sure that there are 7 problems (40 points in total) in your exam paper.
- This exam is closed book and you have 3 hours to complete your exam.
- All of your answers can be written either in Thai or English.
- Dictionary and Calculator are allowed.
- No palm pilots or other hand held computers are allowed.

**1. True or False (3 points)**

- When a router crashes, it is the reliable transport layer that finds a new path to the destination.
- When a router fails, it is the reliable transport layer that makes sure that packets lost in the crash eventually are received at the destination.
- Random Early Detection (RED) mechanism in a router can be considered a technique for congestion control and queue management.

**2. Data Link Layer Mechanisms (ALOHA)**

- a) Describe the difference between pure and slotted Aloha? (3 points)
- b) Which has better utilization? Why? (2 points)

**3. Data Link Layer Mechanisms (CSMA)**

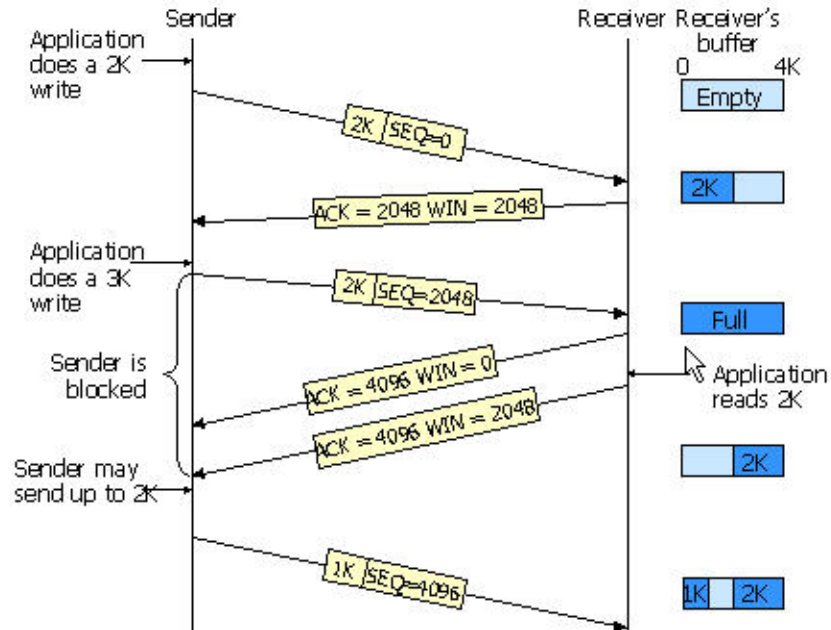
- a) Describe differences between CSMA/CA and CSMA/CD algorithms? (5 points)
- b) Describe “Hidden Terminal Problem” and some possible solutions. (5 points)

**4. Packet Scheduling**

- a) What does the word “Early” in the acronym RED (Random Early Detection) refer to? (2 points)
- b) Why is the assumption of a transport protocol such as TCP important for RED to achieve its desired result? (4 points)
- c) Give reasoning why a TCP flow can achieve unfair sharing of a bottleneck link when it competes for the resource of a bottleneck link with a UDP flow? (4 points)

**5. TCP flow control (5 points)**

The sequence diagram of TCP flow control below shows transitions occurred when a sender want to transfer 3KB data from an application to a receiver. Please describe in details on this diagram and also explain the use of fields such as sequence number, acknowledgement number, and window size in that explanation.



**6. Addressing and Classless Interdomain Routing (CIDR) (2 points)**

From a table shown below, please specify the number of possible hosts.

Net/Masklength	Hosts
128.174.252.0/22	
128.174.242.0/23	
128.174.242.0/25	
128.174.242.7	

**7. Miscellaneous (5 points)**

- Explain the principle of max-min fairness (Fair rate computation) in network resource sharing and also give a simple network scenario (e.g. 3 flows sharing a bottleneck link) to support your explanation (3 points)
- Describe approaches that aim to avoid the problem of address space limitation found in IPv4. (2 points)

Suntorn Witosurapot

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