ENSC 427/894
Sample Questions

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Roadmap

- Samples of past exams:
  - Spring 2019, Midterm no. 1
  - Spring 2018, Midterm no. 1
  - Spring 2018, Final examination
  - Spring 2017, Final examination
- Interactive end-of-chapter exercises
- Videos
- References

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Spring 2019, Midterm no. 1

4. Transport Layer (15 points):

Use a flow diagram with a sender and a receiver side to describe:

(a) Stop-and-Wait

(b) Go-Back-N: assume sender window = 5

(c) Selective Repeat: assume sender window = 5

Solutions:

(a) Kurose's book pages 211 and 220, Chapter 3 slide 43
(b) Kurose's book page 221, Chapter 3 slides 46 and 51
(c) Kurose's book pages 226–229 , Chapter 3 slides 52 and 56

Spring 2018, Midterm no. 1

3. Transport Layer (35 points):

(a) List main phases of the TPC congestion control algorithm. Indicate each phase on a plot of TPC window size vs. time.

(b) Describe the TCP feedback mechanism in case of packet loss. How is the packet loss detected by TCP? How does TCP react to each type of packet loss?

(c) What is Round-Trip Time and how is it estimated?

(d) What is Timeout? How is its value set in TCP?

Solutions:

(a) Kurose's book pages 272 and 276, Chapter 3 slide 104
(c) Kurose's book page 102, Chapter 3 slides 64–65
(d) Kurose's book pages 241–244 , Chapter 3 slides 64 and 66

Spring 2018, Midterm no. 1

(a)

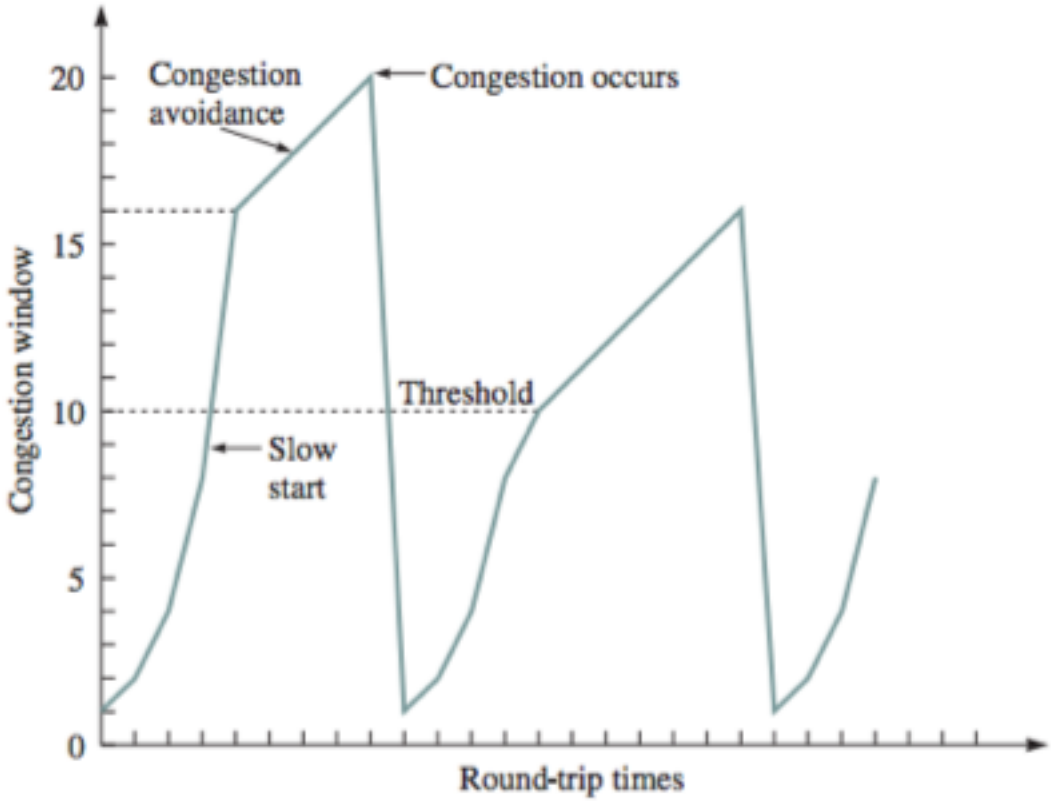

FIGURE 7.63 Dynamics of TCP congestion window

Spring 2018, Final examination

1. **Computer Networks and the Internet (20 points):**

   (a) Name two reference models for communication networks and list their layers (5 points).

   (b) Provide examples of protocols used in each layer (5 points).

   (c) List names of data units in each layer (5 points).

   (d) List layers present in: server, client, router, bridge, and link (5 points).

Solutions:
Kurose's book pages 50–52 , Chapter 1 slides 50–52

Spring 2018, Final examination

(C)

- Application – message
- Transport – segment
- Network – datagrams
- Data link – frames
- Physical – bits

Spring 2017, Final examination

1. **Peer-to-Peer Protocols and Data Link Layer (20 points)**

   (a) Describe the Selective Repeat ARQ protocols using the flowing sequence of events diagram. Include the case when one frame is lost. Clearly identify frame numbers and ACK/NACK numbers.

   (b) What is the maximum allowable size of the send window W_S and the receive window W_R for the $M = 2^m$ $(m = 2)$ numbering sequence? Provide examples that clearly justify your answer.

   (c) Calculate the efficiency η_{SR} of the protocol if the probability of frame loss is P_f.

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Interactive end-of-chapter exercises

Chapter 3: Transport Layer

- Internet checksum
- TCP sequence and ACK numbers, with segment loss
- TCP RTT and timeout
- TCP congestion window evolution
- TCP retransmissions

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Videos

- What is the Internet?
  https://www.youtube.com/watch?v=Dxcc6ycZ73M
- The Internet: IP Addresses & DNS
  https://www.youtube.com/watch?v=5o8CwafCxnU
- The Internet: HTTP & HTML
  https://www.youtube.com/watch?v=kBXQZMmiA4s

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References

- Samples of past exams:
  http://www.sfu.ca/~liilia/ENSC427/sample_exams/index.html
- Textbooks:

  J. F. Kurose and K. W. Ross, *Computer Networking: A Top-Down Approach, 7/E*, Pearson, 2017.

  Interactive end-of-chapter exercises, Supplement to Computer Networking: A Top-Down Approach, 7th edition.
  http://gaia.cs.umass.edu/kurose_ross/interactive/index.php

  A. Leon-Garcia and I. Widjaja, *Communication Networks: Fundamental Concepts and Key Architectures, 2nd edition*, McGraw-Hill, 2004. Errata page
- Course web pages:
  http://www.sfu.ca/~liilia/ENSC427/

  http://www.sfu.ca/~liilia/ENSC894/

References

- Videos:

  What is the Internet?
  https://www.youtube.com/watch?v=Dxcc6vcZ73M

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