

## EE3009 Tutorial 4

### (TCP, UDP, Routing Table)

#### Review Question

- Describe why an application developer might choose to run an application over UDP rather than TCP.
- What is the difference between routing and forwarding?

#### Problem

1. Suppose Host A sends two TCP segments back to back to Host B over a TCP connection. The first segment has sequence number 90; the second has sequence number 110.
  - a) How much data is in the first segment?
  - b) Suppose that the first segment is lost but the second segment arrives at B. In the acknowledgement that Host B sends to Host A, what will the ACK number be?
2. Host A wants to send a file of 4,000 bytes to host B using TCP. Suppose a TCP connection has been made. The initial sequence number (SN) is equal to 1,000 and the MSS is 1,000 bytes. Assume that the transmission rate of the link between hosts A and B is 8 Mbps and the propagation delay is 3 msec. Assume that the receiver sends acknowledgement for every other segment received. In other words, it sends an ACK segment, after receiving two segments. Neglect the header overhead.
  - a) Sketch the sequence of segment exchanges. For those segments transmitted from A to B, indicate the value of SN. For those segments transmitted from B to A, indicate the value of ACK.
  - b) What is the transmission delay of one segment?
  - c) How long will it take for host A to send the file to B until the last ACK segment is received?
3. Consider the three-way handshake in TCP connection setup.
  - a) Suppose that an old SYN segment from host A arrives at host B, requesting a TCP connection. Explain how the three-way handshake procedure ensures that the connection is rejected.
  - b) Now suppose that an old SYN segment from host A arrives at host B, followed a bit later by an old ACK segment from A to a SYNACK segment from B. Is this connection request also rejected? Explain why.

## Computer Exercise

4. In this exercise, you will use Packet Tracer to examine the routing tables of a host and a router. Open the file “Examine\_Route.pka”, and follow the instructions.

The following addressing table may help you have a better understanding of the activity:

Device	Interface	IP Address	Subnet Mask	Default Gateway
R1 – ISP	S0/0/0	10.10.10.6	255.255.255.252	N/A
	Fa0/0	192.168.254.253	255.255.255.0	N/A
R2-Central	S0/0/0	10.10.10.5	255.255.255.252	10.10.10.6
	Fa0/0	172.16.255.254	255.255.0.0	N/A
Eagle Server	N/A	192.168.254.254	255.255.255.0	192.168.254.253
	N/A	172.31.24.254	255.255.255.0	N/A
Host <i>Pod#A</i>	N/A	172.16. <i>Pod#</i> .1	255.255.0.0	172.16.255.254
Host <i>Pod#B</i>	N/A	172.16. <i>Pod#</i> .2	255.255.0.0	172.16.255.254
S1-Central	N/A	172.16.254.1	255.255.0.0	172.16.255.254

- In Task 1, find the IP address of the default gateway of your selected PC.
- In Task 3, find out which networks R2-Central is connected to.
- What would the router do with packets destined to 192.168.254.254?

Show your answers to your tutor.