

CSc 461/561: Multimedia Systems (Spring 2006)

Assignment 3

To be handed in at the lecture on March 24, 2006

1. Please explain with examples (use figures to illustrate when necessary) how to build *sender-specific tree* and *shared tree* in multicast routing protocols.
2. Please explain the purpose of having both *sequence number* and *timestamp* fields in RTP header.
3. Please explain how to calculate *one-way delay variance* (jitter) and *round-trip time* by using information contained in RTCP.
4. Please compare SIP *proxy* mode and *redirect* mode.
5. Please explain the reasons of RSVP adopting *receiver-oriented* and *soft-state* in its design.
6. Three packets of size 3, 2, 1 for connection A, B, C arrive at an empty queue with service rate of 1 and WFQ scheduling of the same weight at $t=0$.
 - (a) Please calculate the finish number for these three packets.
 - (b) Suppose, three more packets of size 1, 1, 1 for connection A, B, C arrive at the same queue at $t=3$. Please calculate and explain the finish number for these three new packets.
7. Please explain why TCP is not a good choice for multimedia applications.
8. Given message $M=(\text{LSB})1110011001100110(\text{MSB})$
 - (a) With generator polynomial $G(x) = x^{16} + x^{12} + x^5 + 1$, please calculate M's CRC.
 - (b) With another message $N=(\text{LSB})1101010101010101(\text{MSB})$, please calculate M and N's checksum in TCP/IP-style.
9. Please give three examples of error concealment techniques in the applications that you have used.