

Course: Advanced Computer Networks

Homework 1

Spring 2012

1. In ATM networks, (20%)

- (a) What is the relationship between virtual path and virtual circuit? (5%)
- (b) How to uniquely identify an ATM connection at source end system? (5%)
- (c) How to uniquely identify an ATM connection at an intermediate ATM switch? (5%)
- (d) Network services can be defined either qualitatively or quantitatively. Can you show which group individual ATM service classes belong to. If in the group of quantitative type of service, please also give the parameters that can better describe the service. (5%)

2. Suppose we want to configure ATM connections to emulate leased line service, what mechanism will be used to police incoming traffic? What are the values of the parameters of the mechanism? (20%)

3. Consider an ATM connection with rt-VBR service class. Suppose the traffic source has peak rate 50Kbps, average rate 25Kbps and maximum burst size 500K bits. Assume the average rate will be enforced in the time scale of every 1 second. (20%)

- (a) What mechanism can we use to enforce peak rate? What are the values of the associated parameters? (5%)
- (b) What is the maximum duration allowed for the traffic source to generate data at the peak rate? (5%)
- (c) What mechanism can we use to enforce sustainable rate? What are the values of the associated parameters? (5%)
- (d) Show the final configuration the policing mechanisms from (a) to (c). (5%)

4. Suppose the Generic Cell Rate Algorithm (GCRA) is used for cell conformance check at UNI. Consider an ATM connection with PCR=4,000 cells/second and SCR=1,000 cells/second. Assume the maximum earliest time allowed for the connection is 2 milli-second, what is the maximum number of conforming back-to-back cells? (20%)

5. What is the goal of effective bandwidth (equivalent capacity) in the resource allocation of ATM networks? (20%)