

POLITECNICO DI MILANO
V FACOLTA' DI INGEGNERIA DI MILANO LEONARDO
MULTIMEDIA INTERNET (part 1)
PROF. PAOLO GIACOMAZZI
February 2, 2014

COGNOME (family name)	
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MATRICOLA	

Exercise 1.

Consider a sequence of two schedulers. Scheduler 1 is EDF and scheduler 2 is Strict Priority. Scheduler 1 receives the traffic flow $X_1(t)$ in service class 1 and the traffic flow $X_2(t)$ in service class 2. Let us denote the traffic flow $X_2(t)$ at the output of scheduler 1 as $Y_2(t)$. The flow $Y_2(t)$ is served by scheduler 2, in priority 2. Scheduler 2 also serves the traffic flow $Y_1(t)$ (a fresh traffic flow) in priority 1. The output line capacity of scheduler 2 is C and the delay thresholds of the service classes 1 and 2 in scheduler 1 are δ_1 and δ_2 , respectively. Calculate the probability that the delay of the traffic flow $Y_2(t)$ is larger than d in scheduler 2.

$$X_1(t): r_1, b_1, H_1$$

$$X_2(t): r_2, b_2, H_2$$

$$Y_1(t): r_3, b_3, H_3$$

$$r_1 = 1 \times 10^6 \text{ (bit/s)}$$

$$b_1 = 0.6 \times 10^6 \text{ (bit)}$$

$$H_1 = 0.8$$

$$r_2 = 1.2 \times 10^6 \text{ (bit/s)}$$

$$b_2 = 0.75 \times 10^6 \text{ (bit)}$$

$$H_2 = 0.9$$

$$r_3 = 0.9 \times 10^6 \text{ (bit/s)}$$

$$b_3 = 0.45 \times 10^6 \text{ (bit)}$$

$$H_3 = 0.75$$

$$\delta_1 = 0.05 \text{ (s)}$$

$$\delta_2 = 0.07 \text{ (s)}$$

$$C = 7 \times 10^6 \text{ (bit/s)}$$

$$d = 0.03 \text{ (s)}$$

Exercise 2.

Explain how Active Queue Management is related to the congestion control features of the TCP protocol.

Exercise 3.

Consider a SP scheduler which is fed in priority 1 by N long range dependent traffic flows, with parameters r , b , H , and in class 2 by M short range dependent traffic flows, with parameters ρ and β . Write the $\alpha(t)$ function required to calculate the probability that the delay of class-2 flows is larger than d . The capacity of the output line of the scheduler is C .

POLITECNICO DI MILANO
V FACOLTA' DI INGEGNERIA DI MILANO LEONARDO
MULTIMEDIA INTERNET (part 2)
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February 4, 2014

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Exercise 1.

Describe the RAS signalling procedures that occur between H.323 terminals and Gatekeepers.

Exercise 2.

What are the advantages and disadvantages of the usage of packet replication techniques to reduce the impact of packet loss in VoIP services?

Exercise 3.

Show an example of a tree topology of video streaming P2P system, given that the rate of the distributed video is 250 kbit/s and the capacity of the uplink of the users' connections is 900 kbit/s..

Exercise 4.

In the interconnection between a SIP network and a PSTN network, the correct management of SCTP streams and SS7 signaling links is a critical issue. Explain why it is important and how it can be managed.