POLITECNICO DI MILANO
MULTIMEDIA INTERNET (part 1)
PROF. PAOLO GIACOMAZZI
July 18, 2014

COGNOME (family name)	
NOME (name)	
MATRICOLA	

Exercise 1.
Consider a network of two schedulers.
Scheduler 1 is an SP scheduler, with three service categories, numbered 1, 2, and 3. The input traffic flows in categories (priorities) 1, 2, and 3 are $X_1(t)$, $X_2(t)$, and $X_3(t)$, respectively.
Scheduler 2 is a GPS scheduler with three service priorities numbered 1, 2, and 3. The input traffic flows in categories 1, 2, and 3 are $Y_1(t)$, $Y_2(t)$, and $Y_3(t)$, respectively. The weights of service categories 1, 2 and 3 are w_1, w_2, and w_3, respectively. The traffic flows $Y_2(t)$, and $Y_3(t)$ are fresh traffic flows. The traffic flow $Y_1(t)$ is the output traffic of scheduler 1, generated by the traffic flow in priority 3 ($X_3(t)$).
The capacity of scheduler 2 is C.

Calculate the probability that the delay of the traffic flow $Y_3(t)$ 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
$X_3(t)$: r_3, b_3, H_3
$Y_2(t)$: r_4, b_4, H_4
$Y_3(t)$: r_5, b_5, H_5

$r_1 = 1.0 \times 10^6$ (bit/s)	$b_1 = 0.5 \times 10^6$ (bit)	$H_1 = 0.8$
$r_2 = 1.2 \times 10^6$ (bit/s)	$b_2 = 0.75 \times 10^6$ (bit)	$H_2 = 0.9$
$r_3 = 0.9 \times 10^6$ (bit/s)	$b_3 = 0.8 \times 10^6$ (bit)	$H_3 = 0.85$
$r_4 = 1.0 \times 10^6$ (bit/s)	$b_4 = 1.1 \times 10^6$ (bit)	$H_4 = 0.7$
$r_5 = 1.3 \times 10^6$ (bit/s)	$b_5 = 0.8 \times 10^6$ (bit)	$H_5 = 0.9$

$w_1 = 0.3$	$w_2 = 0.3$	$w_3 = 0.4$

$C = 10 \times 10^6$ (bit/s)	$d = 0.07$ (s)

Exercise 2.

A SP scheduler with two service priorities and capacity C receives, in priority 1, one short-range dependent traffic flow, with parameters r_1, b_1, and one long-range dependent traffic flow with parameters ρ_1, β_1, H_1. In priority 2, the scheduler receives one short-range dependent traffic flow, with parameters r_2, b_2, and one long-range dependent traffic flow with parameters ρ_2, β_2, H_2. Write the $\alpha(t)$ function to calculate $P(D>d)$ for the traffic in priority 2, using the symbolic values of the parameters.

Exercise 3.
Describe the objectives of the Active Queue Management procedure.

POLITECNICO DI MILANO
MULTIMEDIA INTERNET (part 2)
PROF. PAOLO GIACOMAZZI
July 1, 2014

COGNOME (family name)	
NOME (name)	
MATRICOLA	

Exercise 1.
Describe the techniques that it is possible to use to build a Fiber To The Home Next-Generation Access Network.

Exercise 2.
Provide an example of RTSP interaction between a client and a media server to set up the streamin delivery of a media.

Exercise 3.
Provide an example of an interworked call setup between an H.323 network and a SS7 network.

Exercise 4.
Discuss pros and cons of forest-based and mesh-based topologies in p2p video-streaming systems.