Capacity Planning

Esame del 10 june 2010

Name & Surname

Exercise N. 1 (8 points)

Evaluate the reliability and availability for a system made up by three CPU (working in parallel and whose output is given by a voter), a RAID 5 system with four disks, a bus, one keyboard and monitor, with the hypothesis that each component can fault with an exponential distribution with rate λ_{CPU}, λ_{Voter}, λ_{DISK}, λ_{BUS}, λ_{KEY}, λ_{MON} and a reparation can interest one component at a time, with an exponential rate μ_{CPU}, μ_{Voter}, μ_{DISK}, μ_{BUS}, μ_{KEY}, μ_{MON}

Exercise N. 2 (2 points)

Describe the MVA algoritm for closed network

Exercise N. 3 (5 points)

Draw the markovian process for a closed system made up by a server having a queue with 2 servers and service time exponentially distributed (average service rate 2 sec.$^{-1}$), where at most 4 users over a 10 users population, whose thinking time, exponentially distributed, is 10 sec.

Exercise N. 4 (15 punti)

A Web site is connected at a 100 Mbps Ethernet, linked at the ISP by a router whose latency is 25 μsec/packet. The router links LAN and ISP by a T1 connection (1.544 Mbps). The Web server receives three kinds of requests (see next table) and 5 requests/sec can arrive. (each request size is 300 bytes).
Evaluate the average service time and the input rate that saturates the system.

class	Average document size (KB)	% of requests	http request CPU time (sec.)
1	5	20	0.01
2	10	30	0.02
3	20	40	0.03