

UCF

School of Computer Science
CDA 4150 Computer Architecture
Spring 2004

Performance Evaluation of the I/O System

Due 4/14/04

1.- Measurement of an I/O device reveals that I/O requests arrive on average at 125 I/O per second and the device takes 8 ms to give service.

Determine:

- a) Average service utilization(U).
 - b) Mean time I/O requests spent in the device(R).
 - c) Average waiting time in the I/O queue(W_q).
 - d) Average number of IORB in the I/O system (N).
 - e) Average number of IORB in Queue(N_q).
- 2.- Redo the two examples that start on page 728(HP), but this time using the notation explained in class.
- 3.- We wish to determine the maximum I/O rate that can be supported by one disk. Assuming that the mean duration of an I/O operation is 30 ms, and that no more than 30 ms (average) wait for the I/O device will be tolerated; What is the largest amount of incoming traffic that can be supported?
- 4.- On a disk system, Measurements shows that IORBs arrive at mean rate of 125 IORBs per second and the disk takes 2 ms to give service to each IORB. Using the M/M/1 model to analyze the disk system. What is the mean number of IORB in the disk system? What is the mean time spent in the disk system? What is the probability of having n IORBs in the disk system?

