

Laboratory 2 Token Ring

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Token Ring

- The system is composed of N stations distributed over a ring topology
- The access to the channel is coordinated by a special packet (called *token*) circulating among the stations on the ring
- Each station can transmit only when it owns the token (i.e. after receiving it)
 - If the station has packets waiting for transmission, it transmits one packet, then it passes the token to the following station
 - If the station has no packet waiting for transmission, it passes immediately the token to the following station

Token Ring

- The token length is negligible
- Stations are equally spaced over the ring
- The channel capacity is 4 Mbps
- In each station there is a transmission buffer with size 16 Kbytes
- Packets have constant size equal to 512 bytes
- At each station, packets arrive according to a Poisson process with rate λ packets/s

Task 1: System performance

The aim of task 1 is the coding of a simple simulator of the system and the system performance evaluation

- The performance indexes to consider are:
 - Access delay
 - System throughput (percentage of time for which the channel is occupied by the transmission of user packets)
 - Packet dropping probability

Task 1: System performance

1. Set the size of the network and the number N of stations
2. Obtain simulation results for at least 5 traffic levels λ
3. (optional) Verify the dependency of previous results from the network size

Task 2: Simulator efficiency

The aim of task 2 is to verify the efficiency of simulation model and the simulator

1. Estimate the efficiency of the simulator for low traffic (e.g. calculating the distribution of the event types)
2. Design an alternative model to improve the simulator efficiency
3. Compare the performance of the various considered models