Performance Study of Random Access Protocols by Simulation

Abstract

Carrier Sense Multiple Access with Collision Detection (CSMA/CD) and ALOHA are very well known random access communication protocol in Local Computer Networks. In this thesis work, simulation packages for the performance analysis of:

1. Single Bus CSMA/CD.
2. Multiple Bus CSMA/CD with tree resolution.
3. Single Channel Pure ALOHA and Slotted ALOHA.
4. Multiple Channel Slotted ALOHA.

protocols have been developed. The performance parameters considered are delay, throughput and utilization. Independent parameters are chosen to be number of buses, number of stations and packet generation rate. Variation of the performance parameters with different values of these independent variables are compared. From this comparison an optimum set of parameters can be obtained for a LAN system with given configurations.

The performance of all these protocols have been obtained from the simulators, programmed for different protocols, using the Turbo C programming Language. Results of the simulators have been validated using the fairness test and the comparison with the analytical result. The developed simulators can be used to predict the delay, throughput and utilization of the above mentioned protocols networks of any length, with any number of stations and for any transmission speed.