Two Node Communication Network Model with Weibull Inter arrival Times and Dynamic Bandwidth Allocation

Abstract

In modeling the network traffic Poisson process is extensively used for packet and connection arrivals. Bit in internet traffic an arrival process is bursty due to self-similarity and time dependent nature. Rakesh Singhai et al(2007) have observed that Weibull distribution gives good fit for inter arrival times of packets in network traffic such as LAN, MAN, Wan and Web applications, which oneself similarity. In this paper for the first time we design a two node communication network with Weibull inter arrival times having Dynamic Band Width Allocation. Here, it is assumed that two transmitters are connected in tandem and packets arrive at the source are stored in buffers for forward transmission. The transmission strategy is dynamic band width allocation. The network performance measures such as average number of packets in each buffer, the mean delays in transmission, the throughput, the utilization of transmitters are derived explicitly. It is observed that the time dependent nature of mean arrival rate has significant influence on the performance measures. The dynamic band width allocation can reduce the congestion in buffers and mean delays in transmission. This model also include two
node communication network model and exponential inter arrival times as a particular case.

References


Index Terms

Computer Science

Networks

Keywords

Weibull inter arrival times, Two node communication network, Performance evaluation of the network, Burstiness of buffers