



## Performance Analysis of Statistical Time Division Multiplexing Systems

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### Abstract

Multiplexing is a way of accommodating many input sources of a low capacity over a high capacity outgoing channel. Statistical Time Division Multiplexing (STDM) is a technique that allows the number of users to be multiplexed over the channel more than the channel can afford. The STDM normally exploits unused time slots by the non-active users and allocates those slots for the active users. Therefore STDM is appropriate for bursty sources. In this way STDM normally utilizes channel bandwidth better than traditional Time Division Multiplexing (TDM). In this work, the statistical multiplexer is viewed as M/M/1 queueing system and the performance is measured by comparing analytical results to simulation results using Matlab. The index used to determine the performance of the statistical multiplexer is the number of packets both in the system and the queue. Comparison of analytical results was also done between M/M/1 and M/M/2 and also between M/M/1 and M/D/1 queue systems. At high utilizations, M/M/2 performs better than M/M/1. M/D/1 also outperforms M/M/1.

### Keywords

Statistical Time Division Multiplexing (STDM); Time Division Multiplexing (TDM); Queueing System.