Comparing Queuing Model M/M/1, M/M/K and M/M/D Based on Call Priority

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Abstract : ***In this paper ,we comparing three queuing model for call priority .There are n-numbers of calls coming to a particular user at same time .Our main aim to find the priority call based on this three different queuing model .But also to avoid the spam call ,it means neglect the spam call and give the priority to the important call which means expect the all spam calls .In this system, we are comparing three queuing model i.e., M/M/1,M/M/K and M/M/D with practical data or simulation data as well as theoretical data.***

Keywords — Queuing model, call priority, model, M/M/1, M/M/K and M/M/D.

I. INTRODUCTION

Basically, man is a mutual being; and derives mutual benefits. These mutual benefits are derived from public infrastructures such as, airports, railways, mobile call centers, etc. If these infrastructures are not well managed, it can lead to total collapse of man and public infrastructures. To ensure customers optimal satisfaction there must be strict measures. Satisfaction is obtained when customers waiting time, length of queue is reduced. Customers are always waiting in queues to utilize public facilities at different places and at different times. The most important task is to understand how to manage queues. Here we consider the case of a base station handling larger number of calls than normal. Calls can arrive one by one or in groups. On mobile base station or any public infrastructures the customer arrival process can be described by inter arrival times. The probability distribution can characterize the random customer arrivals. And the larger number of calls can be prioritized based on queuing theory. Queuing theory is the mathematical study of the delays of waiting in line. To predict the queue lengths and waiting time a queuing model has to be created. The branch of operations research is generally considered because the results are used to make business decisions about the resources needed to provide a service.

I. EXISTING SYSTEM

In the existing system, comparison of M/M/1 and M/D/1 queuing model is done based on traffic application . In this paper we dissect the correlation of lining models to vehicular traffic at Kanyakumari area in various places. This segment presents the information sources talk about the M/M/1 and M/D/1 lining models which this article uses to show vehicular traffic could be limited utilizing lining hypothesis in Kannyakumari area .The outcome demonstrated that traffic power $\rho < 1$.This paper looks at the outcome acquired from the two strategies and depicts how these information gathered at different places in Kanyakumari area.

I. PROPOSED SYSTEM

In the proposed system, prioritizing the call using three different queuing model in which it allows all calls expect spam .If spam call is in queue, it detects the spam call and neglect the spam call and allows the next call in the queue which is treated as a priority call. This experiment is carried out in M/M/1, M/M/K and M/D/1 queuing model based on theoretical result and simulation result .Thus, we taken a comparison of three models and conclude the best queuing model in this call priority application.

I. BLOCK DIAGRAM

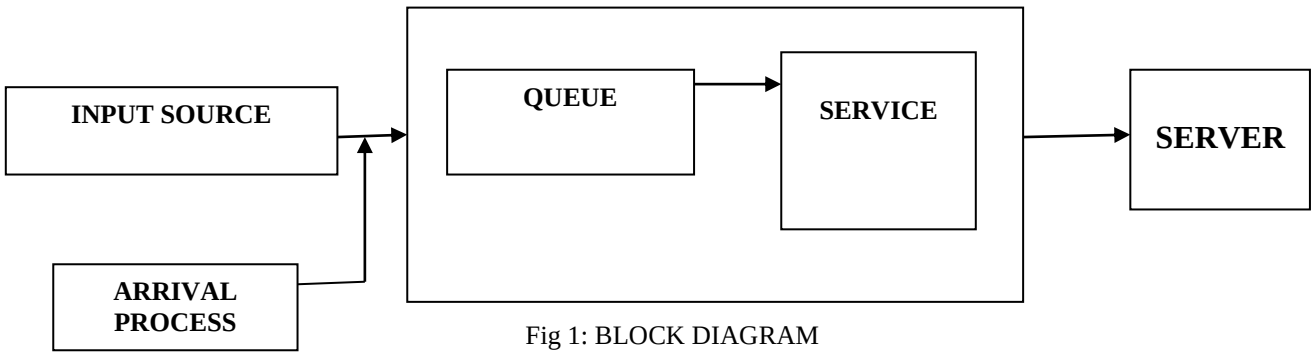


Fig 1: BLOCK DIAGRAM

The main functions of a basic queuing process include:

Input process: The input process is described in terms of random variables representing either the time interval between successive arrivals or the during a time interval the number of arriving. To determine the arrival of customer to the system the distribution is used. A queue can be avoided, if the customer arrivals and offer of service are according to plan. Balking is referred as the customer arrives to the system and leaves it without service.

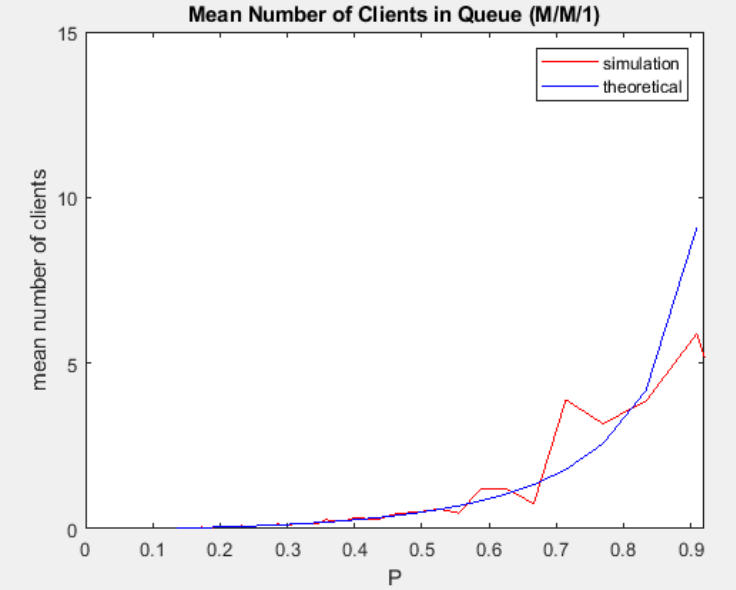
Service Mechanism: It contains the number of customers being served at any time, the number of servers, and the duration of service and its nodes in a network of queues more than one server is arranged in series or parallel combinations. To characterize the service times and the number of servers, random variables are used .Appropriate distribution function is used to represent processing time.

Queuing: The important point of consideration is the number of customers waiting for service. The waiting room or queue length can be considered as infinite. In telecommunication networks the realization of such queue is hard.

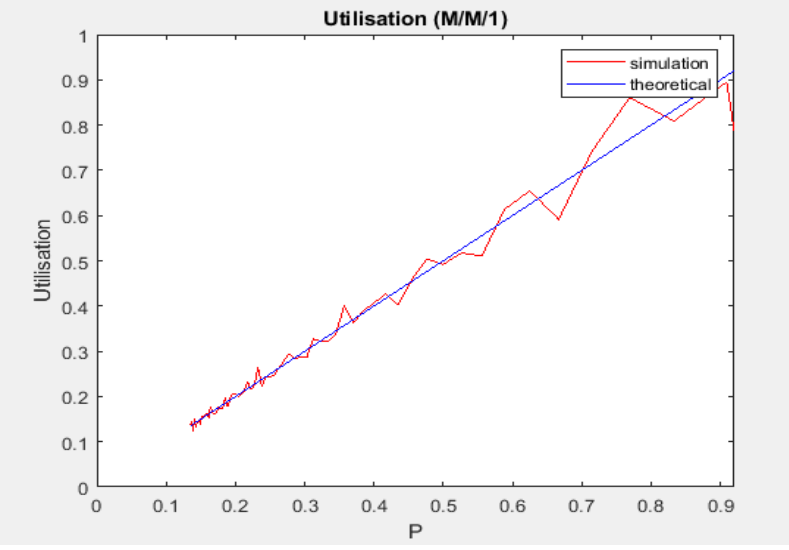
Queue discipline: The ways in which queues are organized are represented by queue discipline. The rules include inserting or removing customers from the queue.

II. METHODOLOGY AND EXPERIMENTAL ANALYSIS

M/M/1: The M/M/1 framework is made of a Poisson entry, one exponential (Poisson) server, FIFO (or not indicated) line of boundless limit and boundless client populace. Note that these suspicions are solid, not fulfilled for handy frameworks (the most noticeably terrible supposition that is the exponential circulation of administration length - barely fulfilled by genuine servers). By and by the M/M/1 model shows obviously the fundamental thoughts and strategies for Queuing Theory. Next two sections abridge the essential properties of the Poisson procedure and give deduction of the M/M/1 hypothetical model. The simulation results for M/M/1 queue is shown below



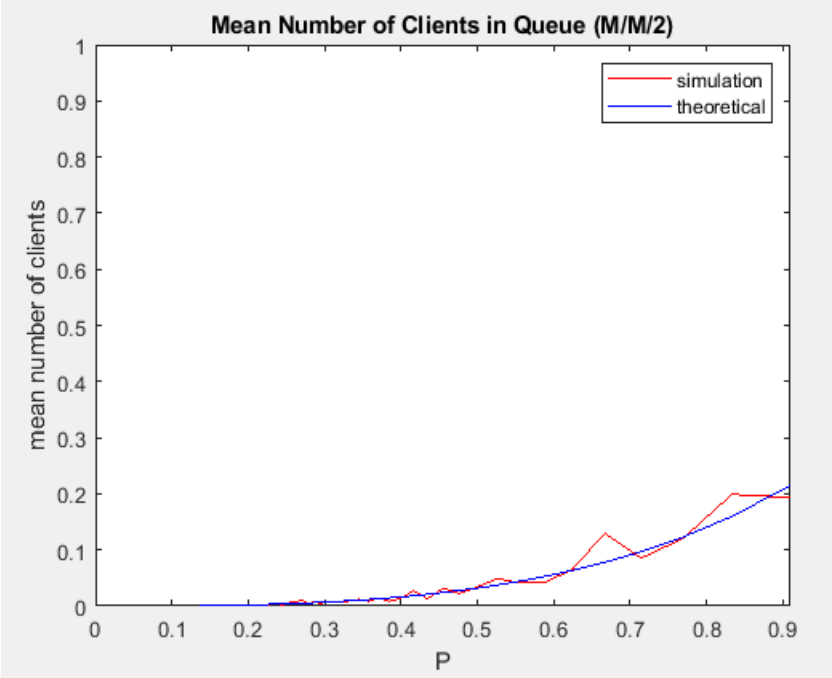
(A) Mean number of clients in queue (M/M/1)



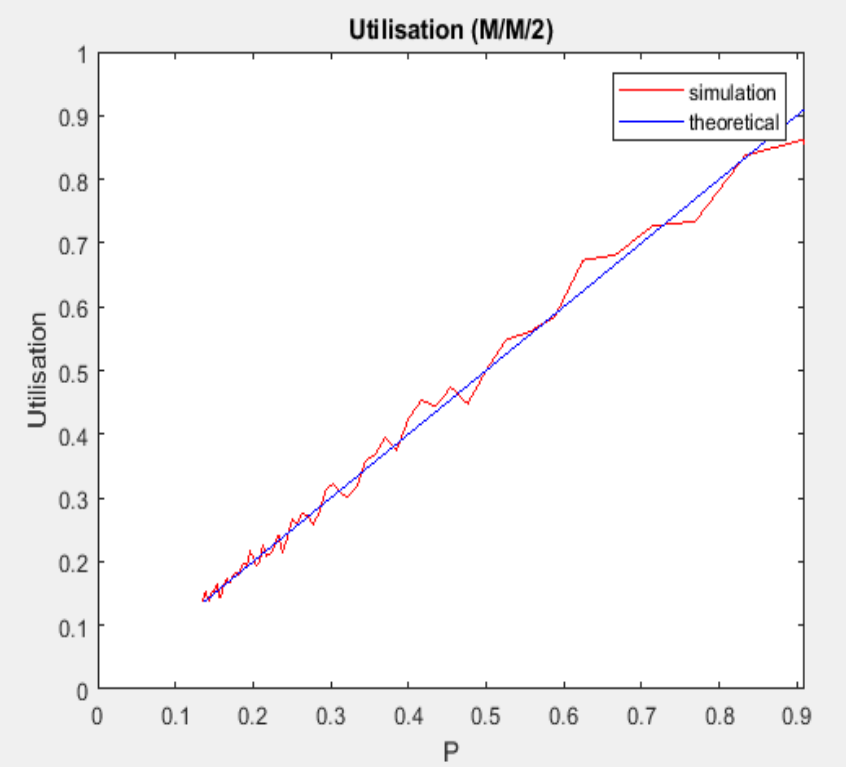
(B) Utilisation

Fig 2: M/M/1 Results

M/M/K: The M/M/2 or M/M/K queuing framework with two heterogeneous servers, one of which is constantly accessible however the different travels without clients hanging tight for administration. The travelling server, be that as it may, comes back to serve at a low rate as a landing finds the other server occupied. The framework is examined in the consistent state utilizing lattice geometric technique. Occupied time of the framework is broke down and mean holding up time in the stationary routine registered. Restrictive stochastic decay of stationary line length is gotten. The following results are shown below:



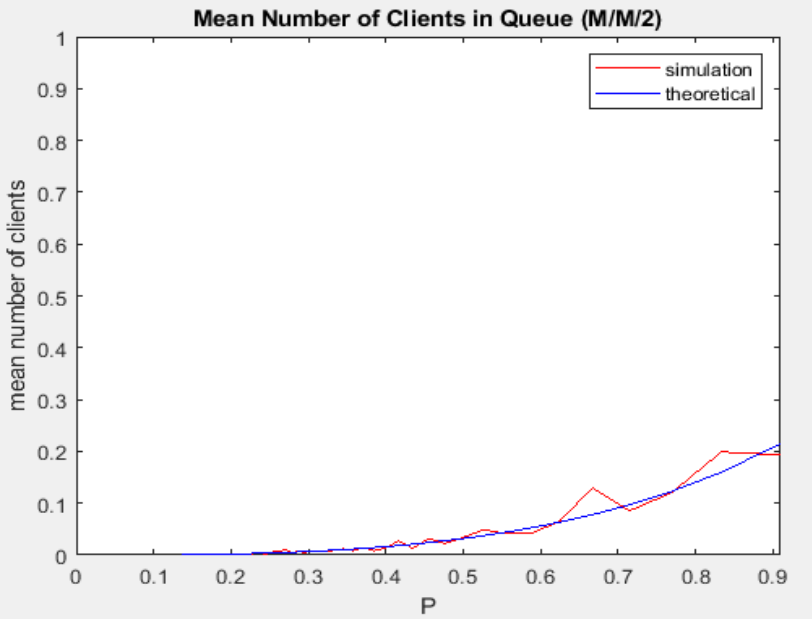
(C) Mean number of clients in queue (M/M/K)



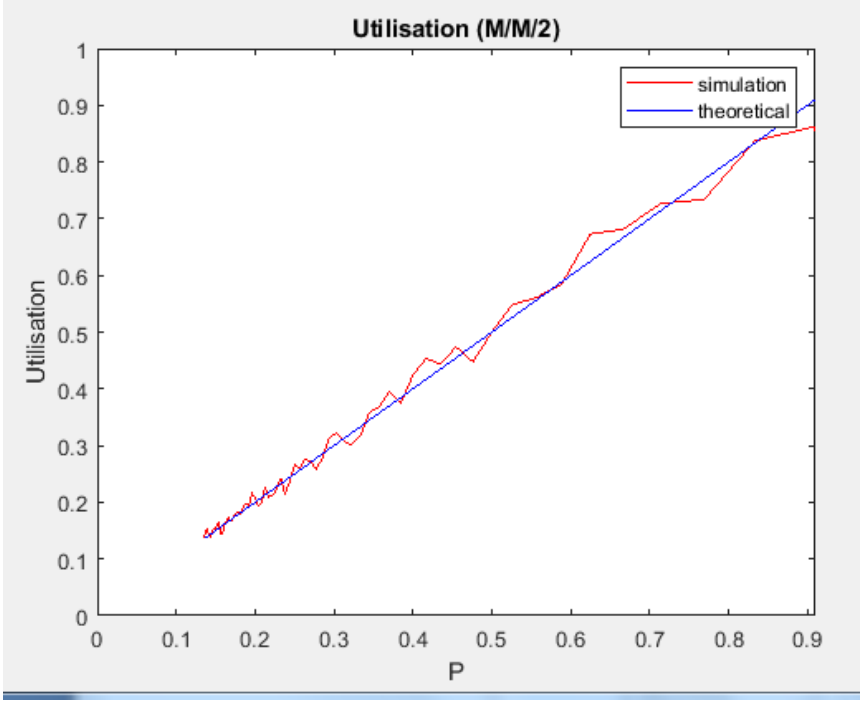
(D) Utilisation

Fig 3: M/M/K Results

M/D/1: The M/D/1 model has exponentially conveyed entry times however fixed administration time (constant).We can process a similar outcome utilizing M/D/1 conditions, the outcomes are appeared .The following results are the M/D/1 which is shown below:



(E) Mean number of clients in queue (M/D/1)



(F) Utilisation

Fig 2: M/D/1 Results

III. CONCLUSION

The comparison of three different queuing model for call priority is done. As per the experimental analysis which consists of both theoretical and simulation of M/M/D is best as compared with other two queuing models i.e., M/M/1 and M/M.K.

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