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A Two Server Phenomenon to Increase Efficiency in Computing Environment

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***Abstract*—**The queue initially designed so that the system will properly work. We can also takes the real time life examples like customers arriving in a particular order, also leaving out in any particular order. The main aim of implementing a queue is to serve the tasks in the same order in which they arrive to the system. So there should be no unfair meaning in which the requests are served. Allocation of scarce resources presents an increasing challenge to hospital administrators and health policy makers. Intensive care units can present bottlenecks within busy hospitals, but their expansion is costly and difficult to gauge. Although mathematical tools have been suggested for determining the proper number of intensive care beds necessary to serve a given demand, the performance of such models has not been prospectively evaluated over significant periods. So the main aim of creating the queue is to avoid the situation like bottleneck where there are many people wants to enter through a small gateway.

Keywords-*Cumulative Department Time, Waiting Time, Idle Time, Queue Length*

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I. Introduction

Queuing Theory: Queuing Theory is a collection of mathematical models of various queuing systems that take as inputs parameters of the above elements and that provide quantitative parameters describing the system performance. As of arbitraryenvironment of the processes convoluted the queuing theory is quitetough and all models are based on very strong assumptions .Queuing systems are practically very important because of the typical tradeoff between the various costs of providing service and the costs associated with waiting for the service or leaving the system without being served. Extraordinaryvaluefirm service is expensive, but costs caused by customers waiting in the queue are minimum. On the other hand long queues may cost a lot because customers do not work while waiting in the queue or customers leave because of long queues. So a classictricky is to catch an optimum system configuration. The resolution may be found by applying queuing theory or by simulation.

1.1 **Queuing System Parameters:**

- **Population of Customers:** Thiscan be considered either limited which is a type of closed systems or unlimited which is similarly a type of open systems. Unlimited population represents a theoretical model of systems with a large number of possible customers. Case of a partial population may be a number of processes to be executed or served by a computer or a certain number of machines to be repaired by a service man. It is necessary to take the term "customer" very generally. Customers may be people, machines of various nature, computer processes, telephone calls, etc.
- **Arrival:** Itexplains the method customers enter into the system. Typically the arrivals are arbitrary with random intervals between two adjacent arrivals. Characteristically the arrival is defined by a random distribution of intervals also called ArrivalPattern. The random arrival of customers frequently is termed as Cumulative arrival time.
- **Queue:** It represents a certain number of customers waiting for service. This is also the case that queue may be empty. Typically the customer being served is considered not to be in the queue. Sometimes the customers form a queue literally for example people waiting in a line for a bank teller. Sometimes the queue is an abstraction for example planes waiting for a runway to land.
- **Service Time (ST)**: It is the time period which is taken by the server for completion of any particular request made for finishing of process. Processes take time for its completion in the server is known as Service time. The service time is different for every process depending on what resources it holds**.** Service Time can be defined easily In terms of the total time that is being served when requests are made. So service time of every individual process may be different.
- **Waiting Time (WT):** Waiting Time is defined as the time period during which a process remain in the Waiting Common queue. The waiting time for each process depends on the number .Processes which are in front of the current waiting process. If it is the first

 ISSN: 2454-4248
143 – 145

process then its waiting time depends depend on the process which is currently being served.

- **Idle Time (IDLT):** Idle time of any server is being defined as the time period during which a server remains idle. The server remains idle means that the time period in which the server has no request to be processed. There is difference between idle times and waiting time in the way is that the waiting time is for the processes which are currently waiting in the common waiting queue and idle time is for the server which is defined as the time period during which a server has no request to be processed.

- **Cumulative Arrival Time (CAT):** It is the random arrival pattern time for the arrival of differentArrival Time tells about the Time when processes are made. The Process in enter in the order in which it was presented in to the queue.

- **Cumulative Departure Time (CDT):** Cumulative departure time of the different processes which are to come into the order in which they have to be served customers into a single pattern order. It is the distribution of intervals between arrivals going out of the particular server can be defined as the sum of total time which is taken by every process to come into the server and the time taken by the server for its servicing and also the waiting time before it comes into the server. So Total Cumulative Departure time of any particular process can be defined in the terms that it is the sum of Cumulative arrival time of any particular process and its service time and also its waiting time. If waiting time is zero it means that there are no waiting for any process .So at that moment Cumulative departure time can be described in terms of the summation of cumulative arrival time and service time

- **Next Arrival Time (NAT):** This Next Arrival time can be described in terms of the new entry of any new process in the Arrival system. Either in the Queue if there is already processing of elements takes place and if the server is idle then the new request directly made to the server.

- **Next Departure Time (NDT**): This Next departure time is the departure of any particular process from the Server which is also defined in the way that a particular process is departed from the server. The next departure time is the way by which an element can be easily leaving out from server after being serviced.

- **Queue Length (QL):** Queue Length can be implemented in the order in which the process enters into the system. The CDT of two processes is to be compare & the process will go to that server which has lesser CDT.So at each point the CDT of the processes is to be compared so that queue length will be changed on that basis. So Queue Length is a very important factor in the processes so that it can be used for implementation while entering into the Queue.

1.3 Single Server Queuing System: The Single Server Queuing System is a type of system in which there is one server and the server is allowed to serve only one request at a time and all the other processes which to make them serve firstly has to wait in the queue and when the server frees the first process then the second process makes into the server and similarly all the other processes will be processed in this order. Consider a service facility with a single server for which we would like to estimate the average delay in the queue for arriving customers. Delay in the queue is defined as the length of time from the arrival of a customer at the information desk line until the instant process begins its service.

The Single server can be implemented on the basis of the requests are being made into the single server. There may be also the idle time of server in which the server remains free or in other words there is no current process to be processed.

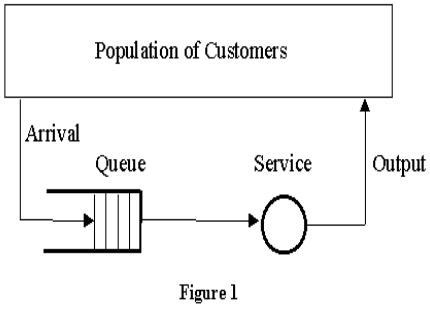

Figure 1: Elements of a single queue queuing system

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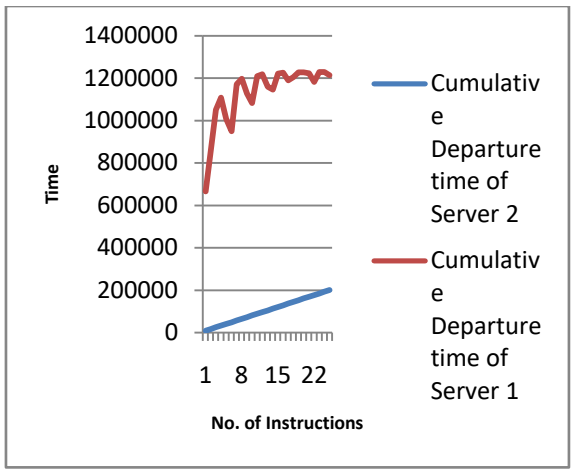
II. PROPOSED ALGORITHM

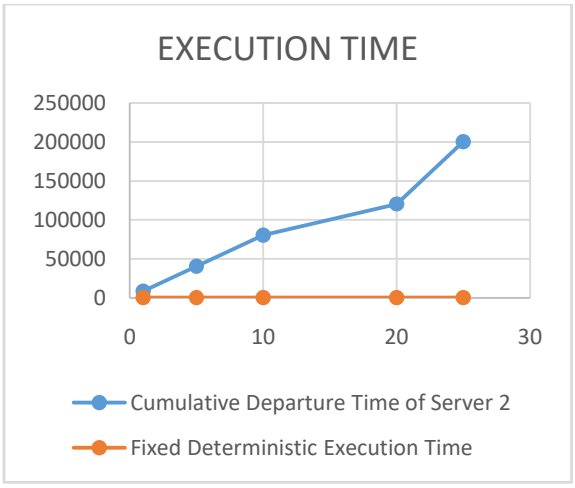
1. Create a Main Grid Information Server (GIS)
2. Initialize the GridSim toolkit
3. Input the value of number of Users (NU)
4. Input ID no. to each user.
5. Create the grid length of each User.
6. Initialize Queue length=0
7. Put all the users in Queue
8. Queue length=Queuelength+1
9. From the Queue put the elements into the Sub GIS Servers
10. Then Queue length=Queue length-1j obs are added
11. Next User = Next User + 1.
12. Find CDT of Each User.

 ISSN: 2454-4248
143 – 145

13. Find Difference check whether firstly Arrival or Departure Takes place
14. Print CDT of each User



Graph above Showing the CDT of Server 1 & Server 2



III. CONCLUSION

By comparing the simulation results of two server and single server queuing model we here shows that the throughput of two server is better as compared with that single server. And by comparing the cumulative departure time of two server with the single server it has been shown that the cumulative departure time of two server is less than that of single server.

IV. FUTURE SCOPE

The Future scope of this topic is that more than two servers can be used to compare their Cumulative Departure Time.

REFERENCES

[1]. Gunter Last, Michel Mandjes, and Sergei Zuyev,(2012), To special issue on mathematical challenges in stochastic networks, Springer Science and Business Media, LLC .
[2]. Falin, G. (1998). “A survey of Different Queuing System”, Queueing Systems .
[3]. Hirayama, T., Hong, S. J., and M. M. Krunz (2004). “A new approach to analysis of polling systems”, Queueing Systems.
[4]. Adan, I. J. B. F. Adam, Boxma, O. J. and Resing, J. A. C. (2001). “Queueing models with multiple waiting lines”, Queueing Systems.
[5]. Bhat, U. N. and Basawa, I. V. (2002). “Maximum likelihood estimation in queueing systems”, Advances on Methodological and Applied Aspects of Probability and Statistics, (Ed. N. Balakrishnan), Taylor & Francis.
[6]. Alfa, A. S. (2003). “Vacation models in discrete time”, Queueing Systems.
[7]. Takayuki Osogami Rudy Raymond(2012) Analysis of transient queues with semi definite optimization.
[8]. Tolga Tezcan(2010) , Stability analysis of N-model systems under a static priority rule
[9]. Bailey, N. T. J. (1952). “Study of queues and appointment systems in out-patient departments with special reference to waiting times”, J. Roy
[10]. Basawa, I. V. and Prabhu, N. U. (1981). “Estimation in single server queues” Nav. Res. Logist. Quart.
[11]. Takagi, H. (1997). “Queueing analysis of polling models: progress in 1990-1994”, Frontiers in Queueing (Ed. J. H. Dshalalow).
[12]. Ramaswami, V. (2001). “The surprising reach of the matrix analytic approach”, Advances in Probability and Stochastic Processes (Eds. A. Krishnamoorthy, N. Raju, and V. Ramaswami), Notable Publications, New Jersey.