

## International Journal of Innovative Research in Science, Engineering and Technology

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# A Survey on Scheduling and Load Balancing Technique on Server

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**ABSTRACT:** A coding challenge website like hackerrank, hackearth gaining the popularity in today's world. This kind of websites might gain the attention of developer towards high level coding. The websites compile the code in specific language and desired output send towards client side. However when multiple servers is assigned to compile the mysterious code, different kinds of techniques are used. One of common example Load balancing. The processes are managed on the basis of power efficiency, networking bandwidth, Processor speed. The desired output will again send back to developer. If multiple programs have to be compiled then appropriate technique such as scheduling algorithm is used. So compilation process becomes faster and also the other process can get chance to compile.

## I. INTRODUCTION

The Coding website mainly focuses on programming challenges where the developer fulfills the requirement as per specification. Hackerrank is one top coding websites which is used by many developers. These websites are most popular because lots of people are gaining attention towards these including developer, IT companies, also programmer researcher. The main theme behind this coder or developer writes the code according to given requirement and submits. The compiler will compile the code accordingly program accuracy, complexity and other related things and grace marks will be given to the particular developer. There are many users which are submitting their program at a time. At server side, we have to schedule all these program to get desired output to client side in less time. A scheduling algorithm used for getting the suitable time for particular program when there is high load and the user will get the output in less time. There are many techniques which can be implemented in this websites. The task queue which will just queue your solution and worker node will pick up task and run it and update the results. There is another technique where you cannot disturb your to your node.

## BACKGROUND:

The Website like HackerRank and other such websites for Work platform gives businesses the option to leverage a built-in library of programming challenges or write their own so as to tailor that programming challenge directly to a company's open position. Technical recruiters then use those programming challenges to test candidates on their specific programming skills and better understand their qualification for a certain role. Candidate's challenges, once submitted, are auto-scored and the results are then provided to the technical recruiter for review.

## MOTIVATION:

When a programmer submits a solution to a programming challenge, their submission is scored on the accuracy of their output. Programmers are then ranked globally on the coding website leaderboard and earn rewards among users. In addition to individual programming challenges, this website also hosts contests like CodeSprints where users compete on the same programming challenges during a set period of time and are then ranked at the conclusion of the event.

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### GOALS AND OBJECTIVES:

- 1) To avail the usage of online compilers to multiple users.
- 2) To balance the load at the server end to reduce overhead and prevent congestion.
- 3) To use appropriate load balancing technique to achieve the same.

### II. LITERATURE SURVEY

Sr. No	Project Name	Author Name	Proposed System Advantages and Disadvantages	This paper refer to:
[1]	“A comparative study of static and dynamic Load Balancing Algorithms”	Payal Beniwal, Atul Garg	<ol style="list-style-type: none"> <li>1. A distributed system can be viewed as an environment in which, number of computers/nodes are connected together and resources are shared among these computers/nodes.</li> </ol> <p><b>Disadvantages:</b></p> <ol style="list-style-type: none"> <li>1. With proper load balancing waiting time can be kept to a minimum which will become weakness of maximum response time.</li> </ol>	Algorithms were proposed for load balancing and their performance is measured on the basis of certain parameters such as, response time, resource utilization and fault tolerance.
[2]	“A Load Balancing Method Based on SDN”	Mao Qilin, Shen WeiKang	<ol style="list-style-type: none"> <li>1. Server load balancing based on SDN compared with the traditional load balancing method, can effectively improve performance of the server load balancing.</li> </ol> <p><b>Disadvantages:</b></p>	A dynamic flow table design algorithm which based on "single flow table" and "group flow table" combination, "Single flow table" can accurately monitor traffic of each client.

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			<ol style="list-style-type: none"> <li>The "group flow table" can effectively avoid the problem of excessive number of flow table, while the "single flow table" again to monitor traffic of each client and provide the basis for changes of the "group flow table"</li> </ol>	
[3]	<p>“An in-depth analysis and study of Load balancing techniques in the cloud computing environment.”</p>	<p>Geethu Gopinath P P, Shriram K Vasudevan</p>	<ol style="list-style-type: none"> <li>Load balancing is playing a vital role in maintaining the rhythm of Cloud computing.</li> <li>The performance metrics of load balancing algorithms in cloud are response time and waiting time.</li> </ol> <p><b>Disadvantage:</b></p> <ol style="list-style-type: none"> <li>There are other works of load balancing in cloud environment which shows that Min-Min outperform the Max-Min algorithm.</li> </ol>	<p>Focused on two load balancing algorithms in cloud, Min-Min and Max-Min algorithm</p>
[4]	<p>“Different Technique of Load Balancing In Distributed System: A Review Paper”</p>	<p>Riyazuddin Khan, Mohd Haroon, Mohd Shahid Husain</p>	<ol style="list-style-type: none"> <li>Load balancing is controlWorld-wide wave for increasing demands so fast and Precise.</li> <li>Load balancing is an important point in increasing efficiency of distributed system operation.</li> </ol> <p><b>Disadvantage:</b></p> <ol style="list-style-type: none"> <li>Difficult task become in very large scale distributed system because the distributed systems always have dynamically changed global state.</li> </ol>	<p>Present overview of the different techniques and methodology given by different researchers throughout the globe and try to analyse their effectiveness in improving the methods of load balancing</p>

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[5]	“LBSRT: An Efficient SDN Load Balancing Scheme Based on Server Response Time”	Hong Zhong, Yaming Fang, Jie Cui	<ol style="list-style-type: none"> <li>1. A load balancing scheme based on server response times by using the advantage of SDN flexibility, named LBSRT.</li> <li>2. We process user requests by obtaining an evenly balanced server loads.</li> </ol> <p><b>Disadvantages:</b></p> <ol style="list-style-type: none"> <li>1. Issue of energy saving in the load balancing on the server does not taken into account.</li> </ol>	
[6]	“Load Balancing In Distributed Systems ”	Timothy C. K. Chou And Jacob A. Abraham,	<ol style="list-style-type: none"> <li>1. Propose a computational model to characterize distributed programs, consisting of tasks and an operational precedence relationship.</li> </ol> <p><b>Disadvantages:</b></p> <ol style="list-style-type: none"> <li>1. Execution time, restart time, checkpoint time, communication time, failure probability these values are difficult to obtain.</li> </ol>	Describing an algorithm for making an optimal module to processor assignment for a given performance criteria.

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[7]	“Load Balancing Techniques: Major Challenge In Cloud Computing - A Systematic Review”	Velagapudi Sreenivas Prathap.M Mohammed Kema	<ol style="list-style-type: none"> <li>1. Load balancing techniques help in optimal utilization of resources and hence in enhancing the performance of the system.</li> <li>2. The goal of load balancing is to minimize the resource consumption which will further reduce energy consumption and carbon emission rate that is the dire need of cloud computing</li> </ol> <p><b>Disadvantage:</b></p> <ol style="list-style-type: none"> <li>1. With proper load balancing, resource consumption can be kept to a minimum which will further reduce energy consumption.</li> </ol>	Proposed the concept of load balancing technique in cloud computing, existing load balancing techniques and also discusses the different qualitative metrics or parameters like performance, scalability, associated overhead
[8]	“Load Balancing of Software-Defined Network Controller Using Genetic Algorithm”	Seung-Bo Kang and Gu-In Kwon	<ol style="list-style-type: none"> <li>1. A software-defined network (SDN) provides flexible network management using centralized and open control. It separates the control and data planes, and the controller is responsible for the control plane.</li> </ol> <p><b>Disadvantage</b></p> <ol style="list-style-type: none"> <li>1. When there are considerable requests for routing information from multiple switches to a controller, the controller overflows and the performance deteriorates.</li> </ol>	Proposing a load-balancing algorithm based on a genetic algorithm. If controller load is not well balanced, our algorithm performs selection, crossover, and mutation to determine optimal load balancing.

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[9]	“Round Robin Load Balancer using Software Defined Networking (SDN)”	Deep Gajjar , Harsh Kotak , Hardik Joshi, Dharmesh Mithbavkar	<ol style="list-style-type: none"> <li>1. The primary function of a load balancer is to distribute traffic among a cluster of servers such that a single server does not become over-utilized and ensure that critical services keep running.</li> </ol> <p><b>Disadvantage</b></p> <ol style="list-style-type: none"> <li>1. In traditional networking, it is not possible to separate the data plane from the control plane. Therefore, the customer had to rely on the vendor for software bug fixes.</li> </ol>	Software Defined Networking (SDN) offers a cost-effective and flexible approach in implementing a load balancer. Moving away from traditional hardware-based networking approach
[10]	“A Survey on Scheduling and Load Balancing Techniques in Cloud Computing Environment”	Subhadra Bose Shaw, Dr. A.K. Singh	<ol style="list-style-type: none"> <li>1. A variety of scheduling algorithms are used by load balancers to determine which backend server to send a request.</li> <li>2. The selected server allocates resources and schedules the job dynamically on some virtual machine (VM) located on the same physical machine.</li> </ol> <p><b>Disadvantage:</b></p> <ol style="list-style-type: none"> <li>1. Load balancing puts a large number of concurrent accesses or data traffic to multiple nodes respectively to reduce the time users waiting for response. But the user might have to waiting in queue for a long time</li> </ol>	Analysed ,discussed different algorithms proposed to resolve the issue of load balancing and task scheduling in Cloud Computing.

### III. PROBLEM STATEMENT

With the ever increasing number of service providers, rising competition, and the growing industry, it is extremely important for service providers to improve their services by improving the operational cost (response time and the processing time of requests). Hence, to satisfy the service level objectives, it is very important to improve the low level

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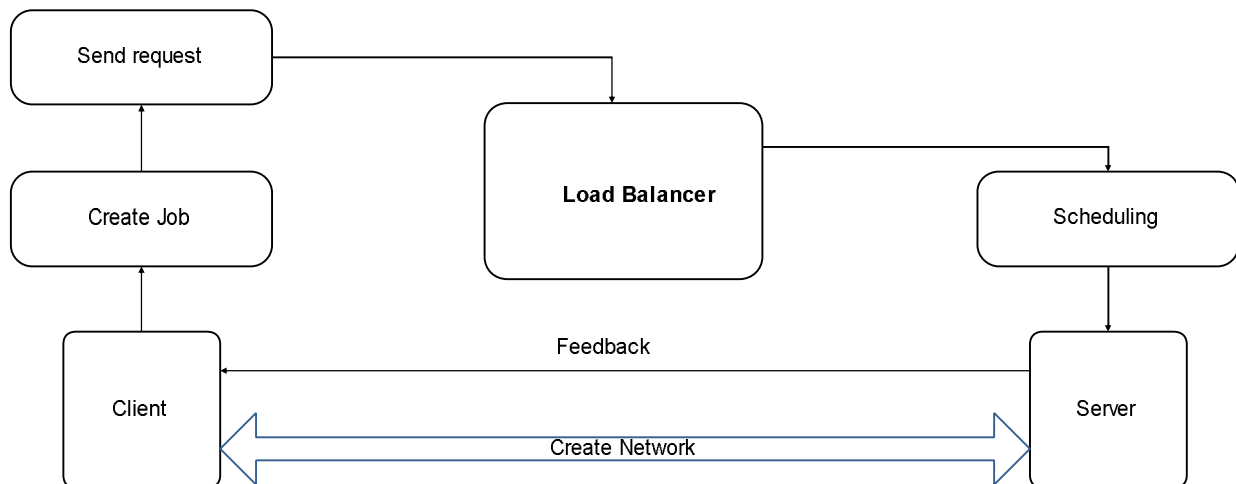
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requirements such as the CPU and memory requirements and the response time of the User base requests. The system works on request response cycle. Whenever we submit a request to server we don't know that the server is busy or free. We don't know the load on server that if there is less load or high load on the server or server can accept the request at that time or not. If a single server goes down, the load balancer redirects traffic to the remaining online servers. When a new server is added to the server group, the load balancer automatically starts to send requests to it.

## IV. PROPOSED SYSTEM

We propose a round robin algorithm to which is use for job scheduling for servers. When any requests come from the clients we first send it to a load balancer which maintains a queue of the entire request. It then applies the round robin algorithm on the requests to balance the load. It will assign a time quantum to each request and then forward it to servers according to availability. If the time quantum is finish then the resource will be allocated to the next request for their time quantum's that no request to wait for longer time for the response and it will also balance the load on every server. If the load on the server is less than it can process the requests in lesser time that will be beneficial for all.

## V. SYSTEM ARCHITECTURE



## VI. MODULES

### Hardware Specification:

Speed	- 1.1 GHz
RAM	- 256 MB (min)
Hard Disk	- 20 GB
Floppy Drive	- 1.44 MB
Key Board	- Standard Windows Keyboard
1) Mouse	- Two or Three Button Mouse

### Software Specification

Operating System : Windows8.1/95/98/2000/XP  
Programming Language : Python,HTML/CSS,PHP

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Database : Mysql 5.0  
Tool : Eclipse

## VII. CONCLUSION

In this paper, we surveyed multiple algorithms for load balancing technique. Load balancing is one best technique which is used to manage the high load arises on server. It puts data traffic to node to reduce time users waiting for response. It also puts calculation from single heavy load to multiple nodes to improve resource utilization of each node. The challenges of these algorithms are addressed so that more efficient load balancing techniques can be developed in future. The nodes on which the website is operating will achieve the further better result by using load balancing technique.

## REFERENCES

- [1] Payal Beniwal, Atul Garg "A comparative study of static and dynamic Load Balancing Algorithms"
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- [10] Subhadra Bose Shaw, Dr. A.K. Singh "A Survey on Scheduling and Load Balancing Techniques in Cloud Computing Environment"