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Balanced Path Selection in Cloud Computing Using Round Robin Algorithm

Arjun Ghosh
Department of Computer Science & Engineering, Maulana Abul Kalam Azad University of Technology (Formerly Known as WBUT), Kolkata, West Bengal, India

ABSTRACT

Cloud is the new computing technology for manipulating, setting and accessing a large number of distributed applications over the network in worldwide. So there need a proper workload distribution in cloud network. The load is evaluated by the quantity of work perform with the system which can be classified as CPU load, network load, memory capability, storage capacity and the utilization of the path that the user uses to access cloud server. A Multi-path protocol uses local nodes and their weight value to find out shortest distance between user and cloud server. This paper shows the appropriate selection of route from user personal device to provider's server by using round robin scheduling algorithm technique. This technique mitigates the performance degradation of heavily utilized link in cloud environment by proper distribution of user tasks over various paths from user to their requested server.

Keywords: Cloud Data Centre, Path Selection, Round-Robin Scheduling, Task Categorization

I. INTRODUCTION

A cloud network is a collection of various nodes, which perform various computations according the request from the client or user. Each node is situated on a path of cloud network that are connected from user device to cloud server. Workload distribution in cloud computing performs an important role where processing and communication in various paths is an important factor affecting the performance of a computer network. Load balancing technique improved system performance by distribution tasks among different paths to avoid congestion on cloud network. In cloud without such paths distribution, user could experience with delay, time out and possible long system responses [1].The technique proposed here that divided the traffic equally, known as round robin algorithm. This phenomenon can drastically reduce workload efficiency of the cloud by flow the user requested task in the network via appropriate selected path.

II. LITERATURE REVIEW

In [2], Bee algorithm exactly follows the activities of bee to get their food. Selected scout bee to go for searching their food in a wide domain of areas, if a scout bee successful to find source of their food, they return to their home and tells the other bees about the path of their potential food resource. Then a group of bees follows that direction to get their food and starts to taking honey at their home and other scouts also tries to find another food resource. Every time after discover a food resource, the scout bee informs others and starts action to take back that potential food to their home. In [3], Ant Colony Optimization uses the same technique as bee algorithm. The algorithm selects the appropriate path via the pheromone strength so take less time than other available algorithm. This technique can improve the service of cloud from cloud data centre to the user with using shortest route of path by proper distribution of node. Thus minimizes the load in a network. In [4], Priority Based Scheduling algorithm, every job assigned with a priority value. The high value priority job would get executed first and then later on, low priority jobs would execute. A fixed priority value assigned to each corresponding job requested coming from user. In [5], First come first serve (FCFS) uses simple technique where first job is allows to execute

first. Resources request coming from user are captured by the queue as a one task. All such kind of request first inserted into the queue and are taken from the head of the queue one by one. A scheduler monitors all the tasks related to the queue.

III. OPTIMAL PATH SELECTION USING ROUND ROBIN TECHNIQUE

Over the last few years, data traffic over the cloud network has been rising exponentially and therefore different innovation solutions have been emerged to manage data traffic. However, there are many numbers of paths appearing in the cloud environment that connect users and their requested task to the cloud server. Therefore, an optimal path selection method needed for the access required cloud server.

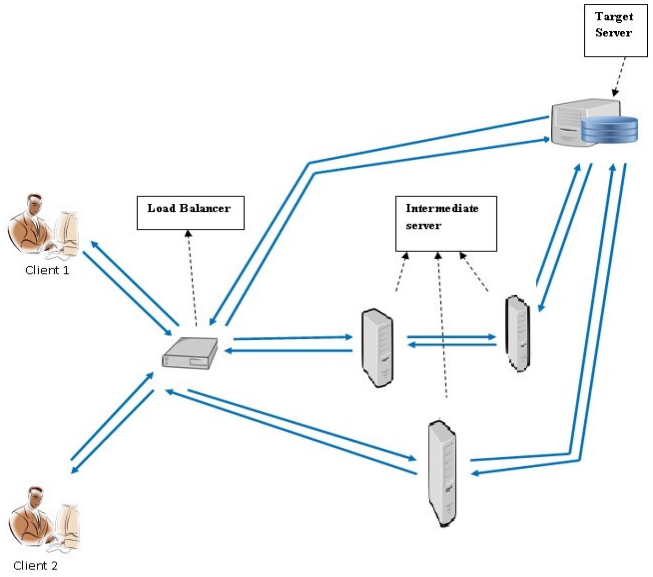

Figure1. Connection From Users or Clients to Cloud Server

A cloud constituted by various nodes, which perform computation according to the request of the clients. This request from the user or client can be random, that can vary in quantity and thus the burden on each node varies. Each node has a unique node id. It has insured that the data are travelling across the cloud cover the shortest distance as well as supply a faster response from cloud server to guest.

The inspection process proceeds as follows:

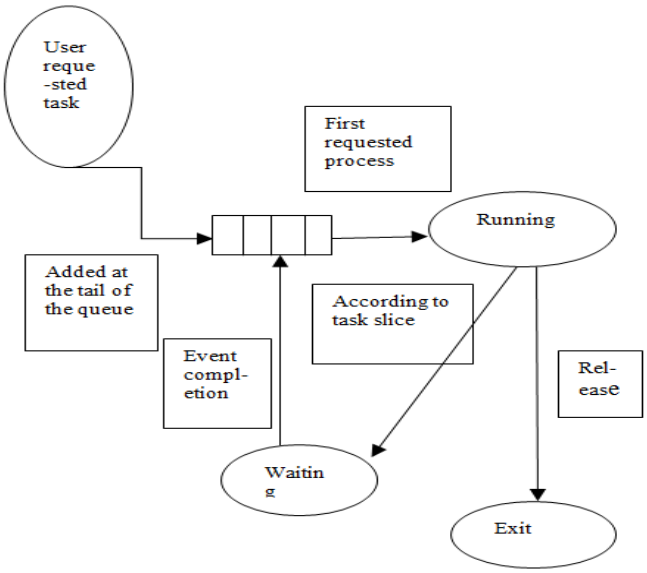

Figure2. Round Robin Scheduling Algorithm (Flow Diagram)

Task slice value assign to a particular path to fetch the server with proper load balancing using round-robin fashion. If all paths are overloaded then next task has to be waiting for available path. Optimize path allocation reduce total task load in the cloud. It is done by the allocation of task to the specific path from user to server and reducing the task load in the cloud.

Input: Set of tasks given by different types of users
Output: User task assigned to corresponding available path to fetch cloud server.
Method:
Step 1: Tasks given by end user are stored in Queue.
Step 2: Identify the number of available paths from end user to their required cloud server.
Step 3: Every paths are assign by an unique path_id based on their distance from source (end user) to destination (cloud server) e.g. path have shortest distance (from source to destination) has an unique id Path_id1, next path_id2 and so on.
Step 4: Every path assign to a maximum task limit that path can tolerate (Say θ)
Step 5: For every Task, if the number of task < θ then task assigned to the path in Round-Robin fashion
Else
Assign the task to next path in Round-Robin fashion.
Step 6: Repeat step 5 until all the tasks are assigned to a particular path.
Step 7: Stop.

Figure3. Appropriate Path Selection Algorithm

Use all the channels (or paths) in regular interval using Round-Robin (RR) Technique describe in figure 3. on a certain time only one channel or path can be used to complete the tour from end user to their required cloud server and other all available channels are still waiting for task e.g. they are still idle which make some advantages over cloud environment. Channel maintenance that increase the reliability of channels is done on that idle time. All the data passes through a certain channel (or path) on a certain predefined time therefore it has advantages over grouping in type of task or task categorization that helps to increase the processing speed in cloud [6].

The procedure depicted in figure 3 was carried out and tested in matlab. There are four paths from node1 to node 16.

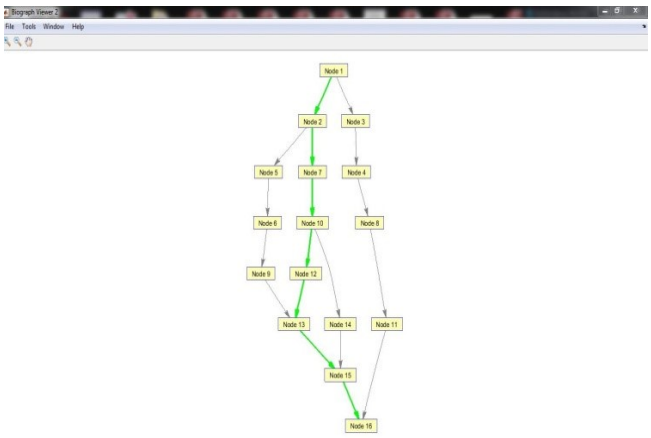

Figure4. Matlab Simulation

All paths wanted to fetch same cloud server (e.g. node16). User resource request store in queue and finally from queue that request is forward to cloud data centre or server using round-robin technique. In figure 4 a optimize path is selected using RR scheduling which is shown in green colour.

IV. CONCLUSION

Cloud computing give everything to the user as a service via network. Load balancing is one of the major issue in cloud computing. Overloading in a system can lead to poor performance that can make the technology unsuccessful. So there need to find an optimized path balancing technique and efficient load balancing algorithm. In this paper, main objective is to find the optimized path for balancing task load in the cloud. The proposed algorithm shows an alternative approach for proper load distribution across the network and in future need more other load balancing strategies that offers more beneficial results to improve workload distribution in the network with little traffic.

V. REFERENCES

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