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AN INTRODUCTORY STUDY ON MERGING ANT COLONY OPTIMIZATION TECHNIQUE WITH WEIGHTED AT LEAST LOAD BALANCING METHOD IN CLOUD COMPUTING

Mishra Pankaj Shambhunath[1]

Teaching Assistant, V.T.Poddar BCA College Pandesara Surat, India[1]
mishrapankajmca@gmail.com

Abstract: Load balancing, resource allocations are the key aspects of cloud computing environment which has a noteworthy impact on the performance. Ant colony optimization (ACO) is characteristically used to search paths through graph [5] and weighted at least load helps in switching among the servers when request are beyond its capacity. ACO leads to hefty load on single server by finding shortest path as the requests are forwarded to same path.
Keywords: Cloud computing, Ant colony optimization, Load Balancing.

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I CLOUD COMPUTING

The cloud is using the virtualization and automation to accommodate the user with Self-service computing products that provide immeasurable scale at very low cost. Cloud computing builds virtualization super computer, with on demand rent way which provides data storage, analysis and scientific computing services through the distributed computing model and the resource pool technology, It is supported many different computing analysis areas like HPC, virtualization, utility computing and grid computing. In general, cloud computing may be a business purpose into forming the sector network revolution, it's extension and development of parallel computing, distributed computing, and therefore the grid computing.

Public cloud: In the public cloud, the cloud provider offers resources without any cost to the public. Every user can make use of the resources; it is unrestricted. The public cloud is linked to the public internet for everyone to leverage.

Private cloud: In a private cloud, the forecasting and provisioning of the cloud are functioned and possessed by the organization or the third party. Here the presented services are delivered to a restricted number of people or group of individuals.

Community cloud: Type of cloud infrastructures exists for singular use by a specific group of users. These are a group of users who share a conjoint mission or have specific regulatory requirements, and it may be managed by the third party or organizations. [3]

Hybrid Cloud: Hybrid Cloud offers the finest of above worlds. It is created by combining the assistance of dissimilar types of cloud (private cloud & public cloud). In these clouds, some of the resources are offered and managed by public cloud and others as a private cloud.

The three different service models present in cloud computing are:

1. Infrastructure as a Service (IaaS): IaaS model offers just the hardware and the network. It permits users to develop and install their operating system, software and run any application as per their requirements on cloud hardware of their own choice.[2]

2. Platform as a Service (PaaS): In PaaS model, an operating system, hardware, and network are obtainable to the user. It empowers users to build their applications on cloud making use of service provider specific tools and languages. [4]

3. Software as a Service (SaaS): In SaaS model, a prebuilt application together with any needed software, hardware, operating system and the network is provided to the user. [6]

II LOAD BALANCING

Load balancing is a solemn concern in cloud computing. With the increase in magnetism of cloud computing among users, the load on the servers and the extent of dispensation done is surging severely.

There are multiple nodes in the cloud, and due to the arbitrary apportionment of a request made by the client to any node, the nodes become unevenly loaded. So to avoid the state where some nodes are either brutally loaded or beneath loaded, the load balancer will consistently divide the amount of work among all the nodes. Thus load balancing will equally dispense the workload among the nodes, and it can help in minimizing deferrals in communication, maximizing the throughput, minimizing execution time and maximizing resource utilization.

III ANT COLONY OPTIMIZATION

Individual Ants square measure relatively straight forward insects that have a really restricted quantity of memory, and their individual behaviour is outwardly random. However, real ants unit are capable of finding shortest or close to shortest methods between a food supplies their colony (nest). They lay some secretion on the bottom, mark by the trail of substance.

An isolated hymenopteran moves basically willy-nilly. A hymenopteran encountering a previous set path will discover it and choose with high likelihood to follow it, so reinforce the path with its own secretion. The collective behaviour, where the more ants follow the path becomes more attractive trail. The process is thus characterized by an optimistic feedback loop, where the probability with which an ant chooses a path increases with the number of ants that previously chose the same path. [2]

IV WEIGHTED AT LEAST LOAD

It is builds on the Least Connection method. Similar to the Weighted Round Robin method each and server is allotted or provided by a numerical value. The load balancer uses these once allocating requests to servers. If two servers have indistinguishable range of active connections then the server with the upper constant are going to be selected the new request.
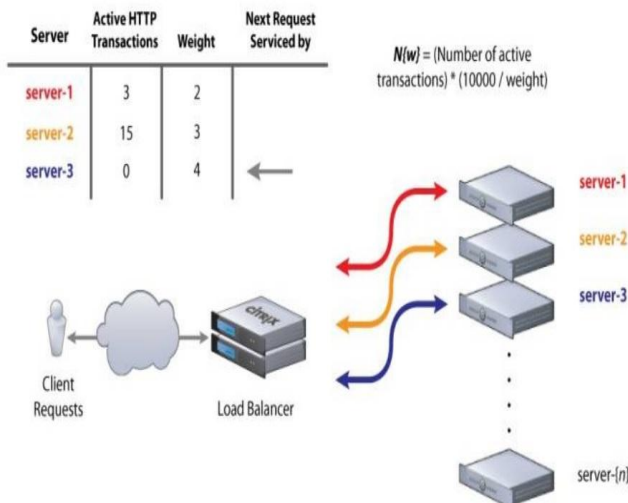

Figure 1:- Represents Weighted Load Balancing Technique

Load balancer takes into deliberation two things: The weights/capacities of each server AND the current number of clients currently connected to each server. [6] The weighted least connections algorithm upholds a weighted list of application servers with their number of active connections and forwards a new connection to an application server based on an amalgamation of its proportion to the weight (or preference) and number of active connections. This algorithm uses more calculation times than the least connection algorithm. However, the additional computation results in allotting the traffic more efficiently to the server that is most capable of handling the request.

V PROBLEMS

Ant colony optimization technique finds the shortest path of among the servers which leads the request to be forwarded to single server which is nearest this raises the load on the particular server if number of request are large in number. Weighted at least load shuffles the load but it does not help in finding the shortest path.

VI ADVANCED ANT COLONY OPTIMIZATION WITH WEIGHTED AT LEAST LOAD

If we form an algorithm which is actually a combination of ant colony optimization and Weighted at least load balancing. We can have benefits of both algorithms and solve the problems of getting load at a particular server which is nearest and switch among the servers. ACO will find the nearest server and weighted at least will switch among servers as the assigned server reaches to highest number of request can be served.

VII CONCLUSION

This paper comes up with two different problems faced in cloud computing that is allocating resources and load balancing. Using Advanced ant colony optimization with Weighted at least load we can find shortest path at the same time once the server gets loaded with n request we can redirect the rest of request to another server for the period of time. Till the server1 becomes available by completing the previous task this reduces the wait time and problem of overloading and saves the server from getting overloaded and makes it secure from crashing due to overloading.

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REFERENCES

[1] Study on Cloud Computing Resource Scheduling Strategy Based on the Ant Colony Optimization Algorithm Linan Zhu, Qingshui Li， and Lingna He College of Mechanical Engineering, Zhejiang University

of technology IJCSI International Journal of Computer Science Issues, Vol. 9, Issue 5, No 2, September 2012 ISSN (Online): 1694-0814

[2] Ant Colony Optimization For Multicast Routing Ying Wang Jianying Xie Institute of Automation, Shanghai Jiaotong University, Shanghai, 200030, China 0-7803-6253-5/00/$10.00 02000 IEEE.

[3] Cloud Task scheduling based on Load Balancing Ant Colony Optimization Kun Li, Gaochao Xu, Guangyu Zhao, Yushuang Dong, Dan Wang College of Computer Science and Technology Jilin University ChangChun, China 4472-4/11 $26.00 © 2011 IEEE DOI 10.1109/ChinaGrid.2011.173 2011 Sixth Annual ChinaGrid Conference 978-0-7695-4472-4/11 $26.00 © 2011 IEEE DOI 10.1109/ChinaGrid.2011.17

[4] Task Scheduling with Load Balancing using Multiple Ant Colonies Optimization in Grid Computing, Liang Bai, Yan-Li Hu, Song-Yang Lao, Wei-Ming Zhang Key LAB of C4ISR Technology National University of Defense Technology Changsha, 410073 P.R. CHINA 978-1-4244-5961-2/10/$26.00 ©2010 IEEE

[5] Extended Ant Colony Optimization Algorithm for Power Electronic Circuit Design Jun Zhang, Senior Member, IEEE, Henry Shu-Hung Chung, Senior Member, IEEE, Alan Wai-Lun Lo, Member, IEEE, and Tao Huang IEEE TRANSACTIONS ON POWER ELECTRONICS, VOL. 24, NO. 1, JANUARY 2009

[6] Load Balancing Algorithms in Cloud Computing Sameeksha Irkal , Vandana Sunag Assistant Professor, KLE BCA P C Jabin Science College, Vidyanagar, Hubballi, India International Journal of Innovative Research in Computer and Communication Engineering Vol. 5, Special Issue 6, July 2017

BIOGRAPHY

MISHRA PANKAJ SHAMBHUNATH Received MCA degree from BMEF affiliated to Gujarat Technical University in 2014, currently working as teaching assistant in V.T.Poddar BCA College Pandesara Since Feb 2015. Research areas network security cloud computing.