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The Dynamic Load Balancing Method On Game Theory For Distributed Systems

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Abstract:
The load balancing model is aimed at the public cloud which has several nodes with scattered computing resources in different geographic locations. When the environment is very large and difficult these divisions simplify the load balancing. The cloud has a main controller that chooses the suitable partitions for arriving jobs while the balancer for each cloud partition chooses the best load balancing strategy. Thus this model divides the public cloud into several cloud partitions. Static schemes do not use the system information and are fewer compounds while dynamic schemes will bring additional costs for the system but can change as the system status changes. The model has a main controller and balancers to gather and analyse the information.

Keywords: Load balancing model, public cloud, cloud partition, game theory.

Introduction:

There are several load balancing algorithms such as Round Robin, Equally Spread Current Execution Algorithm and Ant Colony algorithm. Nishant et al. used the ant colony optimization method in nodes load balancing. Randles et al. gave a evaluate analysis of some algorithms in cloud computing by checking the performance time and cost. Some of the classical loads balancing methods are comparable to the allocation method in the operating system. Load balancing in the cloud computing environment has an important impact on the performance. Good load balancing makes cloud computing more competent and perks up user satisfaction. This article introduces a better load balance model for the public cloud based on the cloud partitioning concept with a switch mechanism to select different schemes for different situations. The algorithm applies the game theory to the load balancing strategy to develop the competence in the public cloud environment.

Related Work:

Cloud computing is competent and scalable but maintaining the steadiness of processing so many jobs in the cloud computing environment is a very intricate problem with load balancing receiving much attention for researchers. Since the job arrival pattern is not expected and the capabilities of each node in the cloud differ for load balancing problem, workload control is critical to improve system performance and maintain stability. Thus the dynamic control has little pressure on the other working nodes. The system status then provides a basis for deciding the right load balancing strategy. However load balancing in the cloud is still a new problem that needs new architectures to adapt too many changes. Chaczko et al. explained the role that load balancing plays in improving the performance and maintaining stability.

Existing System:

Load balancing schemes depend on either static or dynamic methods. Static schemes do not use the system information and are less complex. Dynamic schemes have additional costs for the system but changes as the system status and it is used for its flexibility.

Disadvantages:

Cloud computing environment is a very complex problem. The job arrival pattern is not predictable and the capacities of each node in the cloud differ. Workload control is crucial to improve system performance and maintain stability.

Proposed System:

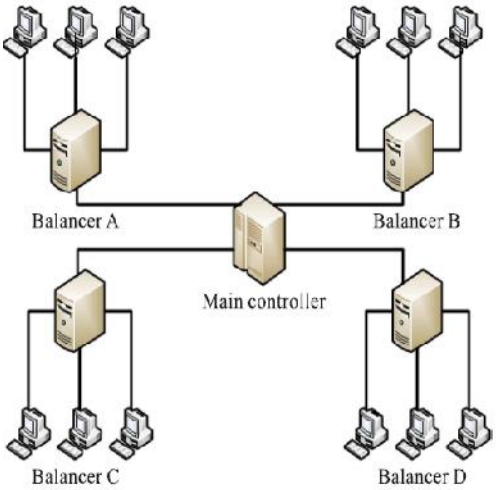
The proposed method has a main controller and balancers to collect and scrutinize the information. Thus the dynamic control has little authority on the other working nodes. The system status then provides a basis for choosing the right load balancing strategy.

Advantages:

Mainly it divides the public cloud into several cloud partitions. When the environment is very large and complex these divisions simplify the load balancing.

Load balancing improves the performance and maintains stability.

System Architecture:



The load balancing approach is based on the cloud partitioning concept. After creating the cloud partitions, when a job arrives at the system with the main controller deciding which cloud partition should receive the job. The partition load balancer then chooses how to allocate the jobs to the nodes. When the load position of a cloud partition is normal this partitioning can be accomplished locally. If the cloud partition load status is not normal this job should be moved to another partition.

Main Controller And Balancers:

The main controller first allocates jobs to the appropriate cloud partition and then corresponds with the balancers in each partition to revive the status information. Since the main controller deals with information for each partition smaller data sets will guide to the higher processing rates. The balancers in each partition gather the status information from every node and then choose the right plan to distribute the jobs.

Assigning Jobs To The Nodes In The Cloud Partition:

The first task is to describe the load degree of each node. The node load degree is connected to various static parameters and dynamic parameters. The static parameters include the number of CPU's, the CPU processing speeds, the memory size etc. Dynamic parameters are the memory utilization ratio, the CPU utilization ratio, the network bandwidth etc.

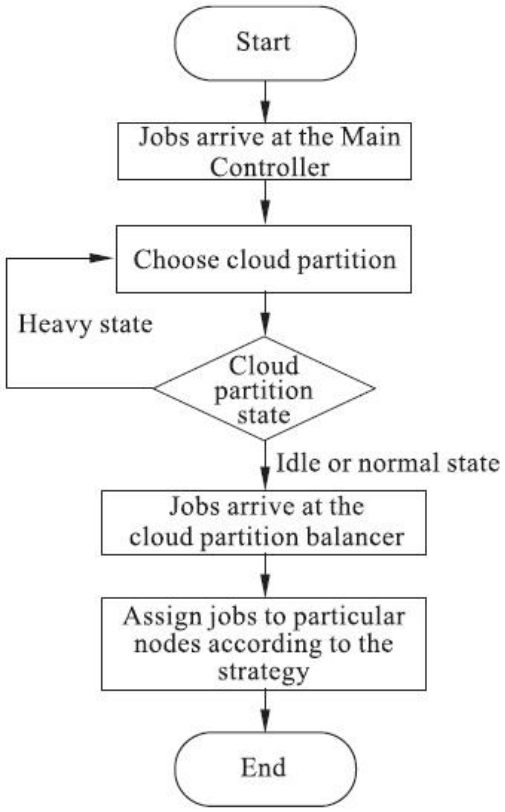
User Module:

Users have confirmation and safety to contact the detail which is reachable in the ontology system. Before regaining or searching the details user should have an account otherwise they should register first.

Load Balance Strategy For The Idle Status:

When the cloud partition is inactive many computing resources are obtainable and comparatively few jobs are arriving. In this situation this cloud partition has the capability to process jobs as quickly as possible so an easy load balancing method can be used. The Round Robin algorithm is one of the simplest load balancing algorithms which go by each new request to the next server in the queue. The algorithm does not record the status of each connection so it has no status information. In the regular Round Robin algorithm every node has an equivalent opportunity to be chosen. However in a public cloud the arrangement and the presentation of each node will be not the same thus this method may overload some nodes.

Project Flow:



Algorithm Used

Skewness Algorithm:

We introduce a concept skewness which would be useful to measure the a variable utilization of the

server. By minimizing skewness we can find the various utilization of the cloud servers.

Hot spot is a small area in which there is relatively higher temperature than the surroundings.

Cold spot is the area in which there is a decrease in ambient temperature

The overload avoidance and the green computing concept are being used to make the resource management precise.

Our algorithm evaluates the allocation of resources based on the demands of VM. Here we define the cloud server a hotspot and if the utilization exceeds the above the hot threshold then it symbolizes that the server is overloaded and Vm's are moved away. The temperature is zero when the cloud server is not a hot spot. We define a cold spot when the utilization of the resources is below the clod threshold which indicates that the server is idle and it has to be turned off in order to save energy. This is done when mostly all servers are actively used below the green computing threshold else it is made inactive

Enhancement:

To avoid the overload we develop a resource allocation system is maintained thus by minimizing the total number of cloud servers used.

To measure the utilization of the server we introduce a concept "skewness" and by minimizing this we can find the utilization of the cloud servers.

We also design a load prediction algorithm to encounter the future resource usages.

Conclusion:

In the data statistics analysis the main controller and the cloud partition balancers need to revive the information at a fixed period. If the period is too short the high occurrence will pressure the system performance. If the period is too long the information will be too old to make good decision. Thus tests and statistical tools are needed to set sensible refresh periods. Other load balance strategies may provide better results so tests are essential to evaluate different strategies. Many tests are needed to assurance system accessibility and competence.

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