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Dynamic Load Balancing Cluster and Fault-Tolerant In Cloud Environment

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ABSTRACT

Cloud computing is emerging technology; it has Stored more amount of data. When accessing the technology, it has to face many problems like load balancing, task scheduling. The main problem is physical host in cloud data center are so overloaded. While it happens, the datacenter has imbalanced. In existing implementation approaches load balancing concepts. It has much complexity. For this problem, we have introduced Load balancing based Bayes theorem and clustering with some constraints.

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Introduction

Cloud computing provide much valuable research like utility computing and grid computing [1] [2]. The main process of cloud computing is to provides services to the user. The cloud data center has a large number of physical host to supply the service to the user. Since every physical host changes constantly, so the task cannot be assigned to every physical host surely. Due to that problem we have to assume the task deployed at every time by user request which is chosen randomly. If the resource amount of task will be greater than a physical host, it cannot handle the task suddenly due to deployment failure of the task. When both of the process same levels, then it would be executed efficiently. If the data center has more than task request constantly, it will make load imbalanced. For this problem, the data center cannot provide efficient external service to users. In fact, the cloud computing data center generally deploy the task depends on highest load demands to the corresponding host. Therefore most of the physical host will be idle in most of the time and it is a waste of computing.

Load Balancing

Load balancing is the main issue in cloud data centers. The main goal is every computing resource can handle the task effectively and quickly. Since the utilization of the resource is improved. In cloud computing environment, the load balancing provides a good solution to various issues like set-up and usage. It has two major tasks, which is the resource provisioning and task scheduling in distributed manner. Existing load balancing concepts is divided into two types. There are Static and Dynamic load balancing.

(i)Static Load Balancing

The cloud provider installs homogenous resources in the static environment. These resources are not that much flexible when it used static environment. In this scenario, the cloud must know about nodes, capacity, processing power, memory, and performance and user requirements. Those requirements cannot change while run time. This problem improved by the static algorithm, also easier to simulate in a cloud environment. But it is not suited for the heterogeneous environment. All the static information cannot reflect dynamic load changes in the cluster of hosts effectively. At presently, most of the open source platforms have utilized the static algorithm to manage resource scheduling. Static load balancing scheduling algorithms [8], [9], [10], [11] are commonly used in the cloud which is round robin, weighted round robin, least connection method, weighted least connection method and so on.

(ii) Dynamic Load Balancing

In the dynamic environment, the heterogeneous resources install by the cloud provider. The resources are flexible in a dynamic environment. In this scenario, the cloud cannot worry about run-time statistics. The requirements may change while environment at run time. The proposed algorithm achieves load balancing in the dynamic environment can easily adapt to run time changes in load. It is difficult to be simulated but is highly adaptable to cloud computing environment.

Load Balancing Based Bayes Theorem and Clustering (LB-BC)

LB-BC introduces the concept of achieving the overall load balancing in a long-term process. LB-BC makes a limited constraint about all physical hosts aiming to achieve a task deployment approach with global search capability in terms of the performance function of computing resource. The Bayes theorem is combined with the clustering process to obtain the optimal clustering set of physical hosts finally. The Bayes theorem has three types of rules which are prior probability, posterior probability and likelihood estimation.

Problem Statement

Every load balancing has two kind of major tasks which are resource allocation and resource scheduling. The task will ensure the efficient resource provisioning and scheduling.

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These tasks ensure low cost, resources saving, and job scheduling.

The combination of Local Search and Particle Swarm Optimization algorithm used in job scheduling in grid environment [5]. In this diagram load, balancing provides the job workflow into control task. It consists of monitor and deployment control. Both of the works interact between LB-BC. When the user gives request to cloud environment .that task will be monitored by monitor. This task will be deployed by LB-BC [13].Finally, all the task will be controlled here. The physical servers handled virtual machine as well as resource provisioning. The entire task can be provided to host with help of host cluster, generally cluster defines classification. That same process to occur, the task will be provided and allocated the work to host with help of host cluster. A single virtual machine mapped on to a single host. It is responsible for assigning the process and every virtual machine. In general cloud data centers easily identify the system function and power consumption process. Resource provisioning process should be solved by using hybrid methodology [12].

In existing model have one main disadvantage which is task selection strategy. The problem is allocated task will be sent to appropriate receiver. For this problem, we have to propose heuristic approach. And it cannot complete the work fully. Hence the processor should not count the number of task spending execution. Similarly, every task does not have locality between distinctions. The important issues of locality can be ignored. For this case, if the arrival rate can be predictable, that all information can be incorporated. Otherwise, the new task will be effectively ignored. While program execution obtained, the task requirement leads to imbalanced load distributions. This imbalance distribution can be reduced in a proposed system which approach is LB-BC In paper [9] is analyzing and evaluating the performance of load balancing concepts with the performance of scheduling in the cloud environment using Clouds the basic algorithm LB-BC and Fault tolerance. We test under Different which clustering based load balancing. Mainly constraints-based approach we have to propose in this paper. Since cost is the important factor in this paper. The existing model shown figure1

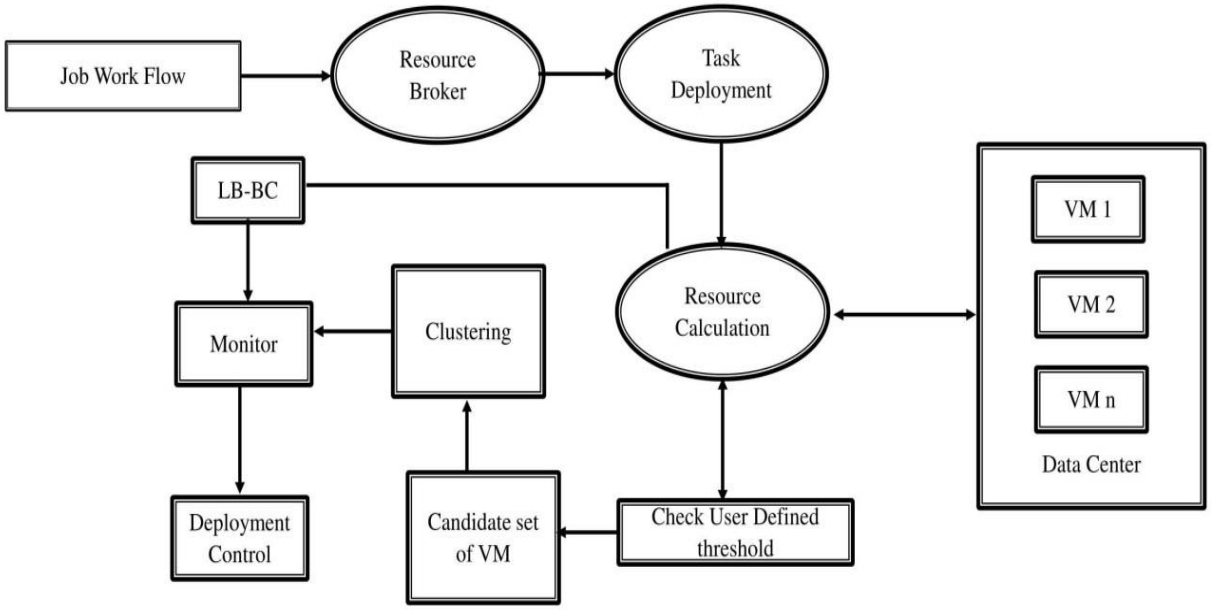

Figure 1. Cloud Load Balancing Architecture.

System Model

The proposed system model based infrastructure as a cloud model. The goal of the proposed system is to ensure that every computing resource can handle the task quickly and effectively. As well as the resource utilization improved. Using fault tolerance we have a backup plan when the system fails occurred. The proposed LB-BC approach is proved reducing the unnecessary computation complexity. Hence, it achieves long-term load balancing effect. Every virtual machine has to meet the cloud data center's task request; the system will deploy the tasks on the physical host in IaaS cloud data center. When the user submits the task requests, the host will be sharing the pool of resources. Normally, the data center will choose the physical host at randomly deployed. In the proposed system, the resource amount of the task will be greater than resource amount of physical host. Since the physical host should not be deployed. Alternatively, the physical host requested the same level of task request .it cannot be managed due to over workload and decline the capacity. The result makes load imbalance of the cloud data center and service efficiency.

In this paper, we have to approach LB-BC which is heuristic task deployment approach. It is used to deploy the task requests received by the cloud data center into target physical hosts in the data center. This algorithm combines Bayes there with clustering as well as fault tolerance. It performance achieves long-term operations from cloud data center. And mainly achieves load balancing of the entire network can be improved. The task deployment process is more effective and performance efficiency has to be improved. The first process in deployment task control these physical hosts, each of which has larger remaining resource amount than the maximum requested resource amount of all task requests, can be searched out to constitute a new candidate set to meet the performance constraint while making LB-BC have the potential of achieving the long-term load balancing. Second, the physical hosts in the set of physical hosts can be regarded as objects waiting for being clustered.

In IaaS cloud data centers; there are too large numbers of physical hosts. In order to avoid this situation that the selected physical hosts can't meet the resource requirements of

requested tasks and to achieve the best clustering effect through minimizing the candidate set, we assume that there are m physical hosts in the cloud data center, and each physical host needs to be assigned to a constraint value for measuring its remaining available computing power in the cloud data center. Aiming to not only fully exploit the advantage (convenient and diverse) of the weighted sum of multiple kinds of resource but also overcome its disadvantage that there exist some unreasonable hosts, we have utilized the methods of probability theory and clustering to achieve the selection of optimal hosts while achieving a long-term load balancing.

It is by picking out the optimal clustering of physical hosts with the relatively larger computing power to process these received tasks. The proposed LB-BC approach will select the optimal physical hosts set to deal with tasks in each round of iterations, and deploy tasks into the corresponding hosts. It not only avoids a large amount of communication cost, but also guarantees physical hosts computing performance. The time of handling tasks will increase with the increase of the number of requested tasks. The model of proposed system is mention in figure 2.

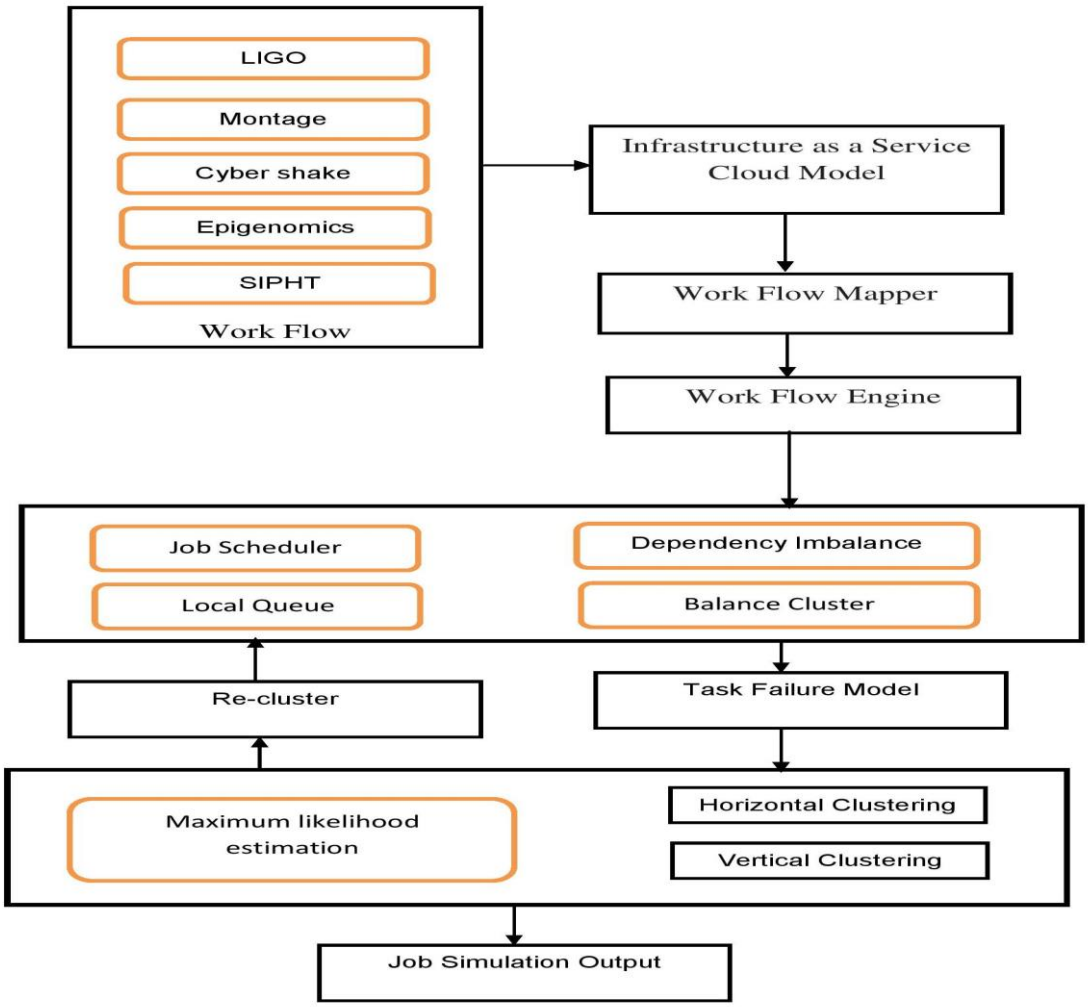

Figure 2. Proposed LB-BC Architecture.

In this set of experiments, the dynamic host failure is simulated by CloudSim It can be done by scheduling some host failure events and host shut-down events to occur during deploying tasks. When some tasks are deployed, the task deployment events are likely to fail since the chosen physical hosts cannot fulfill some the requirements of the requested tasks. We have compared the proposed LB-BC approach with the RD approach and the DLB approach on the failure number of deploying tasks. It cannot acquire the information of each physical hosts remaining resource in the resource pool in real time. When the requested resource amount of requested tasks is greater than the remaining resource amount of a physical host, the deployment event will fail. On the contrary, LB-BC has deployed tasks from a long- term perspective. The remaining resource amount of each physical host chosen by LB-BC would be sure to be greater than the maximum requested resource amount of tasks when it deploys tasks every time. Thus, the

proper physical hosts of most requested tasks could be found in the resource pool dynamically and adaptively. And the LB-BC approach picking out most proper physical host has reduced the failure number of deploying tasks to a certain extent. This is because LB-BC deploys requested tasks from the globally optimal perspective. LB-BC has the ability to deploy every requested task on the optimal physical host quickly and to ensure the overall load balancing of the cloud data center from a long-term perspective. To sum up, the conclusion that LB-BC makes the cloud data center, especially for large-scale cloud data centers, have a better load balancing effect. The proposed LB-BC approach is verified by comparing the external service performance of the cloud data center respectively implementing the three deployment

approaches with time increasing. This model will be elaborated in figure 2. The throughput rate is chosen as the evaluation standard to measure the external service performance since it can represent the comprehensive evaluation of cloud systems, such as components ability to deal with tasks, the transmitting ability of data and the ability to respond task requests to users.

Conclusion

The proposed a task deployment approach LB-BC for the long-term load balancing effect and it has employed a heuristic idea based on Bayes theorem and the clustering process. LB-BC first has narrowed down the search scope by comparing performance values. Then, LBBC has utilized Bayes theorem to obtain the posterior probability values of all candidate physical hosts. Finally, LB-BC has combined probability theorem and the clustering idea to pick out the optimal hosts set, where these physical hosts have the most remaining computing power currently, for deploying and executing tasks by selecting the physical host with the maximum posterior probability value as the clustering center and thus to achieve the load balancing effect from the long-term perspective. Simulation experiments demonstrate that the proposed LB-BC approach can deploy the instant tasks quickly and effectively in cloud data centers. It makes cloud data centers achieve a long term load balancing of the whole network. And also we have proved fault tolerance. And thus the whole approach achieves load balancing with fault tolerance. In existing system used many optimization algorithms for target host. Then optimal target hosts achieve immediate load balancing effect. When it has an immediate effect, it does not guarantee high execution efficiency for the next task. Though, this effect achieves high resource utilization. LB-BC makes limited constraints to all physical hosts. All the constraints perform task deployment approach with global ability. To obtain the clustering process we have chosen Bayes Theorem. It will reduce the number of task failures due to load imbalanced. When failures occurred we have approach fault tolerance. Finally propose approach improved the throughput, external service of cloud data center.

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