Engineering and Scientific International Journal (ESIJ)
Volume 4, Issue 3, July– September 2017
ISSN 2394-7187(Online)
ISSN 2394 - 7179 (Print)

Efficient Resource Scheduling for Cloud Computing Jobs with Sensitive Deadline Alerts

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Abstract— Cloud computing is one of the fastest growing technologies in the world to storing a huge amount of data. The tenants require from cloud providers whose consistency and network performance as an important object. To increase the income of the cloud provider and to get efficient use of cloud for the tenant, the concept of time sliding and bandwidth suggestion is proposed. The efficient resource utilization with deadline requirement and hard bandwidth of a job is guaranteed. Hence, bandwidth to the tenant is not guaranteed. To overcome this, we are using charging system and hard bandwidth guarantee. A tenant can con by requesting without need an additional resource than they actually required or by declaring a shortest job in deadline than the actual one. To overcome this, Dcloud provides a strategy proof charging system, here it support the tenants to present the actual job request and it provides final report analysis to the tenant about their usage. By reporting the slow down file, we add the essentially required resource to run the job to a certain extent and then store more resource to the requested job.

Keywords— *Dcloud; Resource; Bandwidth Assurance*.

1. Introduction

Cloud computing is a fastest growing technology for storing huge files and documents. It is an internet based computing. We have a public cloud and private cloud. In this work, the proposed concept is Dcloud. It is a new interface between tenants and supplier for cloud computing with the deadline requirements. Now a day, cloud communications are improved the data systematic jobs report for a large part of the cloud jobs such as web logs investigation, conditions estimate investigation, finance investigation, machine learning [1][2].

A big part of the jobs is having deadline requirements because there may be no use of results if they do not finish on time. Cloud resource distribution for these jobs is the meeting point of the Dcloud. Dcloud require a tenant to indicate both the requisite resource and the when submit a job request to the cloud. The necessary resource is quantified by the number of virtual machines and related bandwidth, and also the job running duration report under the requested virtual machines and bandwidths. When the cloud supplier assign the resource, they can control the time interval between the job running duration and the job deadline to restructure the resource demand, they can professionally utilize the outstanding cloud resource without break the job's deadline. Implementing a new resource allocation algorithm to develop the space, it uses time sliding to level out the peak command and also bandwidth scaling to balance the usage of network resource and non-network resource in the cloud. I compare the DCloud with other bandwidth distribution results.

Even if the concepts above are the sensitive and capable, they can face up to exist in transferring the basic ideas into a useful structure. A number of methods and the algorithms are using to deal with the test. When we reshaping the tenant's needs, we depend on the inversely relative regulation, to calculate the duration of the job approximately after bandwidth scaling, without any information of the request semantics. Then we use the concept of dominant resource utilization to perform a dual optimization of different types of cloud resources when assigning them to the tenants. By introducing a reporting relax index to cover the possible reporting errors from the tenants [8].

Finally, proposing a plan-proof and then the job based charging system to support the tenants to submit the exact deadline and the income. The result shows that the Dcloud can extensively develop the virtual machine and bandwidth use below a variety of settings and complete more than two times the jobs within the deadlines. In spite of less cost for a person job, Dcloud can increase the cloud supplier's profits by more than 50%.

2. Existing system

In existing system, to present a network performance and the efficient resource utilization, the baseline algorithm (BL) and virtual cluster algorithm (VC) is used. By using the Baseline algorithm, it does not provide bandwidth assurance and so some accepted jobs cannot finish before deadlines. By using the Virtual Cluster algorithm (VC), it provide bandwidth guarantee and some allocated jobs can finish within the deadline [4]. But it cannot provide the job assurance. In virtual machine property, only the uniform bandwidth request is processed.

ISSN 2394-7187(Online)
ISSN 2394 - 7179 (Print)

2.1. Disadvantages

- It does not have bandwidth assurance.
- By using the baseline algorithm, it cannot finish the job within the deadline.
- Because of slow processing time it does not finish the jobs.
- It cannot accept much more jobs during the process.
- The cost efficient of the cloud is also high.

3. Proposed system

This paper is to provide the efficient use of resources, to give a bandwidth assurance and also job assurance with the deadline control. We proposed the concept of Dcloud. It makes cloud computing jobs to be flexible and use the resources efficiently by using Dcloud resource allocation algorithm. With the help of that concept Dominant Resource Utilization (DRU) can perform various resources which is supported with the high arrangement space of resources such as memory, processing and storage. By using the resource utilization record (RUR) we can establish the launching time of each job and to maintain the virtual machine use for every server and bandwidth utilization for every link over time.

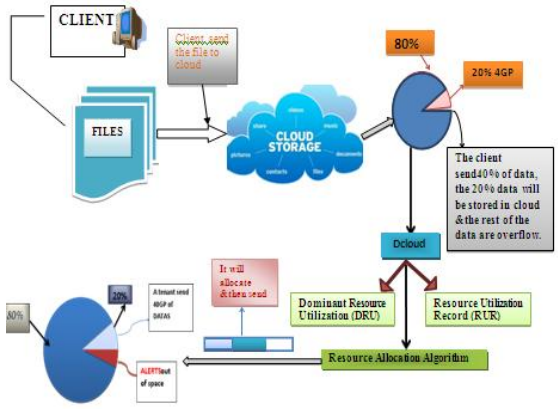

Fig1: Architecture for Deadline Alerts

3.1. Merits of proposed system

- This method provides a job assurance with deadline constraints.
- After the deadline, the usage report is sent to the user to show their usage.
- Dcloud can accept much more jobs than the existing system by using time sliding and bandwidth scaling.
- It also increases the cloud supplier's income with less cost for an individual tenant.
- By using strategy proof charging system, the tenant cannot take advantage by requesting unreasonably left over the resources.

4. Methodology

Resource allocation algorithm
Resource allocation approach is for cloud computing jobs for both their deadlines and efficient utilization of the cloud resource [6].
Input: J=<n, b, p, d>
J=job request
n=Requested number of VMs
b=requested bandwidth for each VM
p=job running duration
d=interval between the submitting time and the expected latest time
Output:
J`=<n, b, p',d>
p'=relaxed form of p
j'= reshaped form of J
where,
Y=<n,b,p',d>-------reshapedas----→Y=<n,b',t',p

5. Result

Developed a simulator to evaluate the performance of Dcloud with a particular relationship of other two representative resource allocation algorithms namely, *baseline*(*BL*) allocation simulate the current model that do not provide the bandwidth assurance to the tenants and *virtual cluster* (*VC*) algorithm [3]. Using the Dcloud, BL and VC assigns the cloud resource for requested jobs in the same order. BL share a lowest place VMs to reduce the network traffic. VMs compete for the network Bandwidth using TCP.

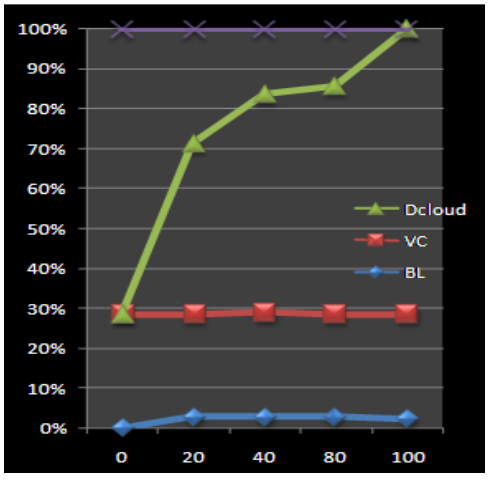

Fig: 2: Percentage of jobs meting their deadline
Deadline extension ratio (%)

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5.1 Parameters of Resource Requests

The two parameters in resource quests are the jobs predictable deadline extension ratio and the bandwidth requested for per VM.

5.2 Deadline Expansion Ratio

The larger expected deadline expansion ratio for a cloud provider is to reshape the request. The deadline extension ratio has almost known the blow on virtual cluster. VC does not consider the job deadline at all. Hence we focus on talk about BL and DCloud. In figure 2, both BL and DCloud complete more jobs with larger expected deadline expansion ratio. For DCloud, the gain comes from larger space for both time scaling and bandwidth scaling. For BL, it is due to higher possibility for a job; it can finish before a longer deadline.

BL performs the bad among the three, because there is no bandwidth assurance and some accepted jobs cannot finish within before the deadlines. Virtual cluster can give bandwidth assurance and the allocated jobs can finish within the deadlines, but the accepted jobs are much less than Dcloud. When it is high as 20, Dcloud can successfully finish about 40% and 80% more jobs than VC and BL, respectively. Dcloud performs better than VC because more jobs can be accepted. A good allocation algorithm should make capable utilization of VM slots.

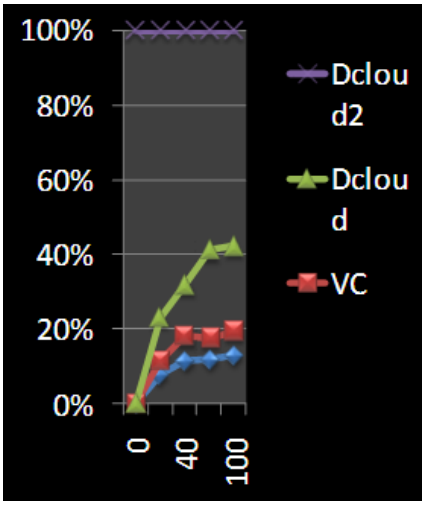

Fig. 3: Server link utilization ratio
Deadline extension ratio (%)

In figure 3, all three representations do not result in high use of server links due to the over payment in higher-level links. VC and BL have parallel results, but both of the algorithms are less than DCloud. Because the VC results in bandwidth destruction, while the contest based bandwidth sharing in BL may cause bandwidth waste if the number of flows in server links are unwarranted [7]. Due to the limited space, we do not include the graphs. Dcloud performs even better than under this metrics, because it can make more restricted virtual machine allocation by bandwidth scaling.

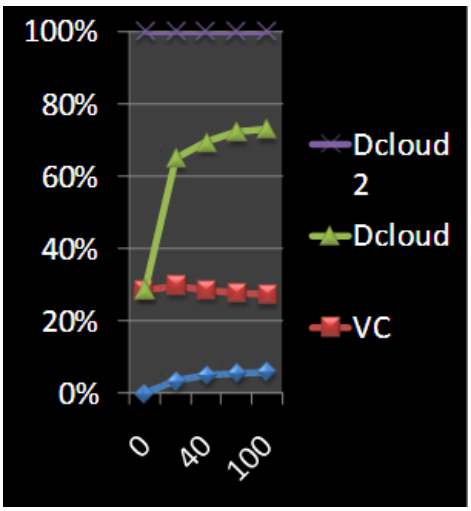

Fig.4: Revenue of the cloud provider
Deadline extension ratio (%)

In profit metric evaluation, figure 4 shows that the Dcloud considerably outperforms VC and BL, per job price in Dcloud [5]. The income of BL is the lowest, but it has the highest VM use. When r = 20, DCloud's income is 76.7% and 1,156% higher than that of VC and BL, respectively.

5.3 Requested Bandwidth per VM

Dcloud has better advantage because it has a larger bandwidth command. It is balancing the usage of two resources by bandwidth scaling. When the bandwidth condition is as low as 50Mbps, DCloud can receive 63.8% and 926% more than VC and BL, respectively. At the other intense the bandwidth requirement is as high as 500Mbps; the gap is even clearer, i.e., Dcloud receive 87.0% and 2,170% more than VC and BL, respectively.

6. Conclusion

Because of deadline constrain, implementing the Dcloud concept with the help of Dominant Resource Utilization (DRU) and Resource Utilization Record (RUR) is made in this research work. DRU is used to allocate the high configuration space, memory or storage. RUR can determine the launching time of each job and maintain the virtual machine utilization for every server and also bandwidth use for every link over the time. A resource utilization algorithm is used for both meeting their deadlines in cloud computing and capably to make the use of cloud resources. Dcloud provides the expected performance to the applications and also leaves possibility for shaping the resource needs to better match. Dcloud uses

ISSN 2394-7187(Online)
ISSN 2394 - 7179 (Print)

the time sliding and bandwidth scaling to determine the most correct time interval to launch each job, as well as the virtual machine locations and kept link of the bandwidth. A charging mechanism is used to inspire tenants to submit the actual necessary resource. It makes the resource allocation algorithms to work more successfully. While comparing with the baseline allocation and virtual cluster allocation, Dcloud can finish considerably more jobs within the deadline. It makes better use of the virtual machine, network resources and also gain much more cost.

7. Future Enhancement

Many articles are there to provide bandwidth assurance but Base line (BL) algorithm does not have a bandwidth assurance. In virtual cluster (VC), it has a bandwidth assurance but it do not provide job assurance. So we proposed the Dcloud Resource Utilization algorithm, it provide more bandwidth assurance, provides the cloud computing jobs to be flexible and the income of the cloud is also high. Still the income is high by increasing the bandwidth. So in future work we can use quality of service (QOS) to minimize the cost within the particular time deadline. Many algorithms are ailable to reduce the cost of the cloud DPDS (Dynamic Provisioning Dynamic Scheduling).

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