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Request Redirection and Resource Procurement Using Cloud with Guaranteed QoE

Mrs. K. Satiyapriya[1], Mounika Chennupati[2] & Bhavya Sri Cheruku[3]
[1]Faculty, Department Of Computer Science And Engineering, SRM University, Tamil Nadu, India
[2,3]Student, Department Of Computer Science And Engineering , SRM University , Tamil Nadu , India

Abstract: *Cloud computing paradigm is providing video service providers to host their web sites and also helps to reach those websites to millions of people . The user requirements are increasing day by day and it is the duty of video service provider to satisfy those requirements to maintain competitive edge . In order to reach these goals the video service provider should rent virtual machines from the cloud service provider. With dynamic arrival of user requests the work load on virtual machines is increasing which results in increased cost . Scheduling of dynamic user requests and providing resources for satisfying them is done systematically in the proposed system which will reduce the workload so as cost and guaranteed users with promising quality of experience(QoE). The users can not only watch the video as it was but also can change the quality of video or format of the video according to the internet speed in his country which is generally referred as video transcoding.*

Keywords: *Cloud computing, cloud video service provider, Resource provision, Request Scheduling, Quality of Experience.*

INTRODUCTION

The media commercial center is evolving quickly, with numerous substance makers gushing media to a developing range of on the web, online networking, and versatile outlets. There's a wide fluctuation in video quality, record sizes ;the sheer volume of media resources are basically blasting, leaving media experts attempting to keep up a focused edge. Video content represented an amazing 64% of all the world's web movement in 2014, however even with every one of the ALS difficulties, and feline recordings that year brought us, we are expected a blast in utilization throughout the following 4 years. As per another report from Cisco, by 2019, online video will be in charge of four-fifths of worldwide Web movement. Video information handling additionally requests huge measure of CPU cycles.

Video applications frequently include in pre-preparing steps, for example, transcoding, encoding/disentangling, reflection, Rendering and so forth to fulfill diverse necessities .Information handling included in these strides is figure escalated and ordinarily done on the Video Administration Supplier (VSP) side. It postures noteworthy difficulties for VSPs to proficiently arrange and deal with their processing limit keeping in mind the end goal to fulfill client demands in an opportune way, especially when solicitations may have bursty landing designs. The distributed computing offers an advantageous approach to video administration suppliers to progressively modify processing assets leased from cloud administration suppliers as per interest pay-as-you-go way.

Be that as it may, it is trying for VSPs to progressively lease figuring assets in the cloud in a savvy way to furnish clients with satisfactory level of QoE. Firstly, the client demand entries are changing and bursty client requests are hard to anticipate.

With various QoE necessities connected with these client demands, it is hard to locate an ideal approach to guide them to an assortment of asset sorts in the cloud. Furthermore, adjusting the expense of cloud asset leasing and QoE of client is a troublesome basic leadership issue itself, e.g., higher QoE may cost a VSP more in transient yet compensate it in long haul. Thirdly, a solitary CSP might not have servers situated in topographically distinctive locales that adequately cover the clients of a VSP. For this situation, the VSP may need to utilize various CSPs with various topographically found servers to give attractive QoE to its clients. The distinction in CSPs' asset evaluating in various districts and time spaces further confuses the asset leasing and client demand planning for VSPs.

LITERATURE SURVEYS

Project Title: Stochastic Models of Load Balancing and Scheduling in Cloud Computing Clusters

Author Name: Siva Theja Maguluri and R. Srikant

Description:

Cloud computing services are becoming ubiquitous, and are starting to serve as the primary source of computing power for both enterprises and personal computing applications. We consider a stochastic model of a cloud computing cluster, where jobs arrive according to a stochastic process and request virtual machines (VMs), which are specified in terms of resources such as CPU, memory and storage space. While there are many design issues associated with such systems, here we focus only on resource allocation problems, such as the design of algorithms for load balancing among servers, and algorithms for scheduling VM configurations. Given our model of a cloud, we first define its capacity, i.e., the maximum rates at which jobs can be processed in such a system. Then, we show that the widely-used Best- Fit scheduling algorithm is not throughput-optimal, and present alternatives which achieve any arbitrary fraction of the capacity region of the cloud. We then study the delay performance of these alternative algorithms through simulations**.**

Project Title: **Dynamic Request Redirection and Elastic Service Scaling in Cloud-Centric Media Networks**

Author Name: Jianhua Tang, Wee Peng Tay, Yonggang Wen

Description:

We consider the problem of optimally redirecting user requests in a cloud-centric media network (CCMN) to multiple destination Virtual Machines (VMs), which elastically scale their service capacities in order to minimize a cost function that includes service response times, computing costs, and routing costs. We also allow the request arrival process to switch between normal and flash crowd modes to model user requests to a CCMN. We quantify the trade-offs in flash crowd detection delay and false alarm frequency, request allocation rates, and service capacities at the VMs. We show that under each request arrival mode (normal or flash crowd), the optimal redirection policy can be found in terms of a price for each VM, which is a function of the VM's service cost, with requests redirected to VMs in order of nondecreasing prices, and no redirection to VMs with prices above a threshold price. Applying our proposed strategy to a YouTube request trace data set shows that our strategy outperforms various benchmark strategies. We also present simulation results when various arrival traffic characteristics are varied, which again suggest that our proposed strategy performs well under these conditions

Project Title: Towards Transcoding as a Service in Multimedia Cloud: Energy-Efficient Job Dispatching Algorithm

Author Name: Weiwen Zhang, Yonggang Wen,Jianfei Cai, Dapeng Oliver Wu

Description:

In this paper, we investigate energy-efficient job dispatching algorithm for transcoding as a service (TaaS) in a multimedia cloud. We aim to minimize the energy consumption of service engines in the cloud while achieving low delay for TaaS. We formulate the job dispatching problem as a constrained optimization problem under the framework of Lyapunov optimization. Using the drift-plus-penalty function, we propose an online algorithm that dispatches the transcoding jobs to service engines, with an objective to Reduce Energy consumption while achieving the QUEue STability (REQUEST). We first characterize the fundamental tradeoff between energy consumption and queue delay for the REQUEST algorithm numerically, and obtain its performance bound theoretically. Second, we study the robustness of the REQUEST algorithm, with numerical results indicating that the REQUEST algorithm is robust to the inaccuracy of estimating the transcoding time. Third, we compare the performance of the REQUEST algorithm with the other two algorithms, i.e., Round Robin and Random Rate algorithms. By simulation and real trace data, we show that by appropriately choosing the control variable, the REQUEST algorithm outperforms Round Robin and Random Rate algorithms, with smaller time average energy consumption and time average queue length. The proposed REQUEST algorithm can be applied in cloud-assisted multimedia transcoding service.

3. PROPOSED SYSTEM

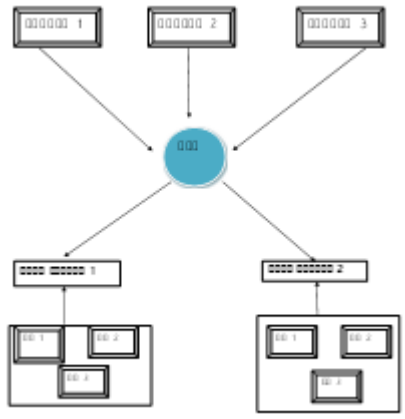
The proposed framework handles methodically resource renting from different CSPs and schedules client solicitations to these resources in an about ideal way. Specifically, the structure is fit for taking care of heterogeneous sorts of client solicitations, workloads and QoE necessities. VMs in the cloud have distinctive sorts and are evaluated powerfully.

We influence the presence of Content delivery network (CDN) to host video administrations on their different datacenters appropriated in different areas. With our methodology the content provider can give a productive, financially savvy and quality support to any number of customers**.**

3.1 ADVANTAGES

- Cost reduction
- Satisfactory user QoE level
- Run video services in heterogeneous environments consisting of dynamic user work load

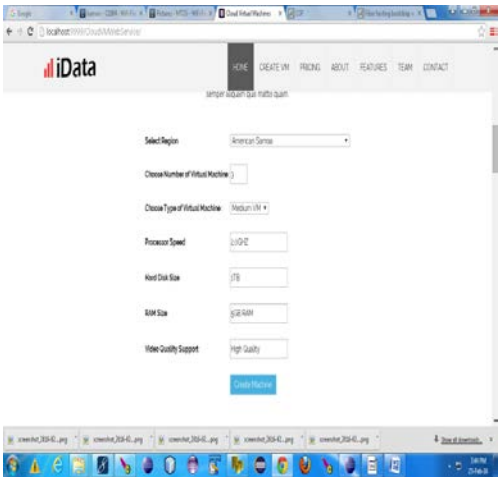
3.2 PROPOSED DESIGN



4. METHODOLOGIES

4.1 Creating Virtual Machines

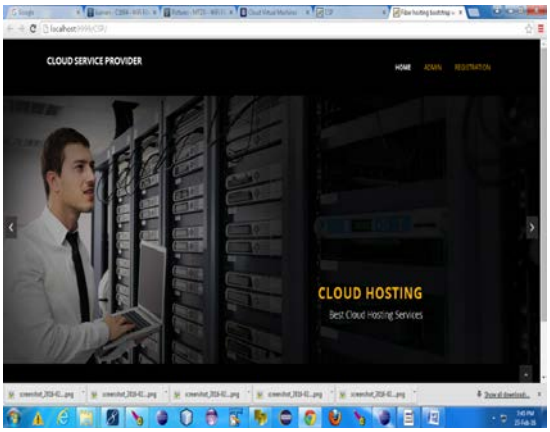
Here we are creating virtual machines for each country based on the CPU capacity. CPU capacity is based on the storage and processing speeds.

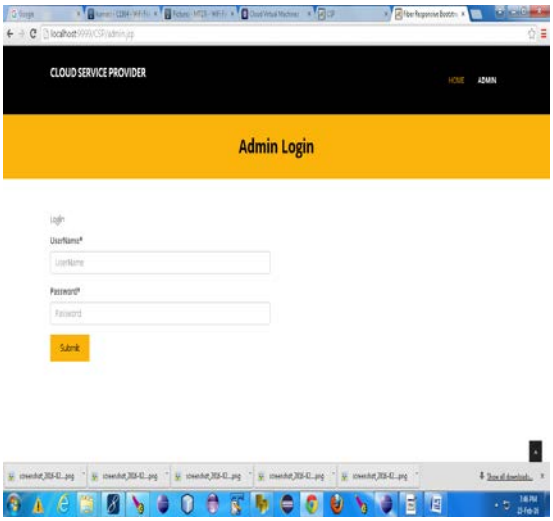


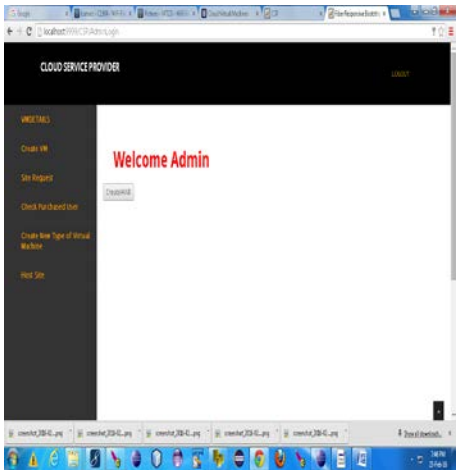
4.2 CLOUD SERVICE PROVIDER REGISTRATION

In our frame work by default we registered cloud service provider with user name:"admin" and password : "admin"

.The purpose of cloud service provider is it will host video site of video service provider and also allocate vitual machines requested by video service provider. The virtual machines allocation is done by clicking on the button "createWAR" .

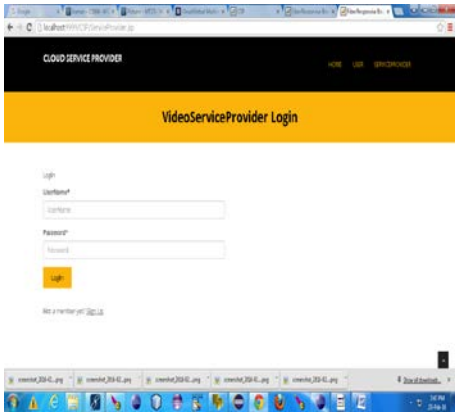


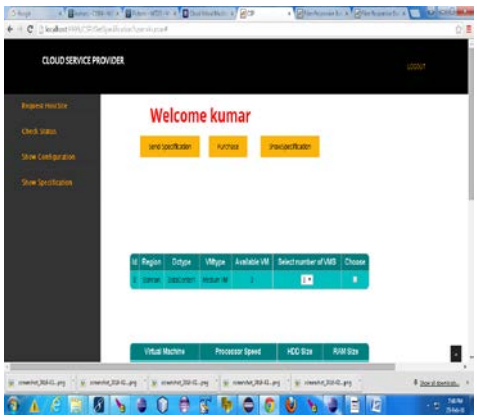




4.3 VIDEO SERVICE PROVIDER REGISTRATION

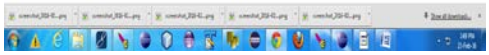
Here the video service provider will register by signing up. After successful registration he can login and choose the specification available and click on send specification. This send specification will redirect to clouds service provider and he will allocate the requested VM's for the VSP to host the video site . The video service provider will purchase the required number of VM's after redirecting to banking application .





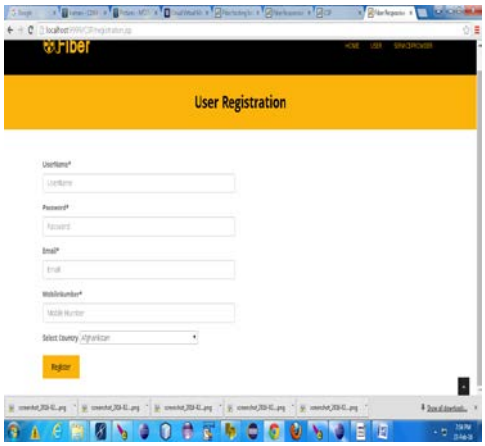
4.4 BANKING APPLICATION

After successful registration of VSP a random account number and atm password are generated along with OTP ,with this information he can make payment for renting VM's .



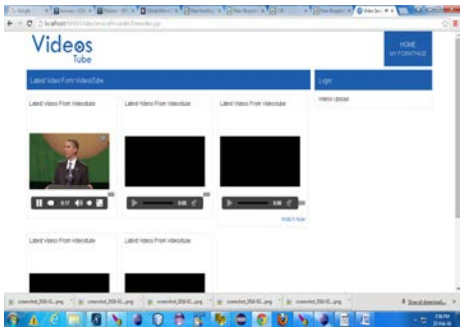
4.5 USER REGISTRATION

The user has to register in order to access the website . After signing up he will be given user name with which he can access the videos available in his region . The user requests such as changing of video quality are satisfied.



5. RESULT AND DISCUSSION

The videos are displayed to the user only if the user belongs to country the VSP is hosting the Website , otherwise the user will get "sorry video will be currently unavailable in your country"



6. CONCLUSION

This paper proposed a novel resource redirection and asset acquirement from the point of view of VSPs. We demonstrated that proposed system is fit for lessening the expense of giving video services in the cloud and accomplishing tasteful client QoE level all the while. The strategy gave an effective approach to run video administrations in a general and heterogeneous environment comprising of element client workload, dynamic asset value, various administrations with heterogeneous QoE necessities, and heterogeneous datacenters.

7. ACKNOWLEDGMENT

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