

Design and Implementation of Innovative Schemes for Allocating Resources in Cloud for Media Streaming Applications

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ABSTRACT: Media streaming approaches like sound ,video and content streaming, within a short time have grabbed the attention of huge population in the Internet. These applications are bandwidth intensive applications.Now it turns out to be monetarily wasteful to give the support of the clients along with a satisfactory QoS by depending only on the resources present at the supplier. Keeping in mind the end goal to manage this we will move on for cloud computing.This offers a versatile foundation that the media suppliers can make utilization of these to acquire spilling assets as indicated by their requirements.Media content suppliers are charged for the measure of asset held under two provisioning plans with the assistance of valuing models,in the cloud.This scheme offers discount rates depending non-linearly on time period during which the resources are reserved.Here an open issue is to decide,right measure of assets that are to be saved and their reservation time such that the expense on the media supplier is minimized. We propose a straightforward resource assignment calculation for asset reservation that maximally profit by reduced rates offered in the tariffs,simultaneously it ought to guarantee that an adequate measure of assets are saved in the cloud. The consequences of numerical assessments demonstrate that the recommended calculation quite diminishes the capital expense of distributing assets in the cloud.

KEYWORDS: Cloud Computing,Media Streaming and Pricing Models.

I. INTRODUCTION

The number of video streams that are served are increasing rapidly every year. This huge demand is creating a burden on the centralized data centers at the media content providers[1]. Presently it turns out to be financially wasteful to give the support of the clients alongside an acceptable QoS by depending just on the assets, present at the media provider.In request to conquer this issue the media content suppliers need to furnish their data centers with over-provisioned measure of asset so he can meet the strict QoS requirements.Now keeping in mind the end goal to equip,the media supplier at first considers the insights of use tops for limit in a daily,weekly,monthly and yearly premise and they for the most part focus on the top use .According to the top expected interest, server farms are equipped.Now the issue here is ,the data centers are prepared in a manner that they are continually hoping to have top demand,but this is unrealistic all the times aside from in few cases(ex: cricket match).In typical days just 30% of the aggregate limit is used [2]. Subsequently enormous measure of asset are sit the greater part of the time,which is exceptionally inefficient and inefficient.Instead of purchasing over the top servers and building private information centers,they can utilize the required assets from the cloud providers.Cloud supplier will charge the media supplier for the asset provided,under two provisioning plans on-interest arrangement (postpaid) and reservation arrangement (prepaid).In on-interest plan,whenever the media supplier finds the requirement for resources,then he will buy and pay as per that and the valuing model utilized here is pay-per-use. Yet, in reservation plan,without any present request the media content supplier will buy the asset ahead of time and pay before the genuine usage of resource.The estimating model utilized here is nonlinear time rebate duty. In this manner here we will be utilizing the mix of both the provisioning plans keeping in mind the end goal to minimize the expense on the media content provider.

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Two challenges were, determining the appropriate measure of asset that must be held and their reservation time such that the expense on the media content supplier is minimized. With a particular final objective to address this problem, the media content supplier must anticipate the future interest accurately. Thus here we will propose an resource allocation algorithm.

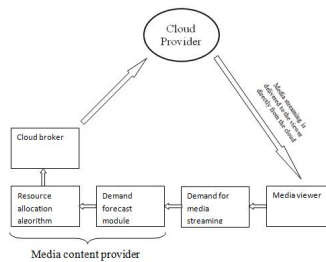


Fig 1: System Model representing the interaction between the media viewer, media content provider and the cloud provider

II. RELATED WORK

Resource Allocation Algorithm

This algorithm is based on the time slots, in every time slot the media content provider will make a decision to reserve the resources in cloud. The amount of resources reserved and the reservation time vary from one time slot to another and these two parameters are determined in this algorithm.

The cost of reservation is given by,

$$\text{Cost}(w_j, \text{Alloc}_j) = \text{tariff}(w_j, \text{Alloc}_j) * w_j$$

where, $\text{tariff}(w_j, \text{Alloc}_j)$ is the amount charged by the cloud provider for reserved resources Alloc_j in j th window and w_j is the j th window size.

Minimum amount of resource required to reserve during window j is given by,

$$\int_0^{\text{Alloc}_j} \frac{1}{x\sigma\sqrt{2\pi}} e^{\left(-\frac{1}{2}\right)\left(\frac{\ln(x)-\mu_{\max}}{\sigma}\right)^2} dx = \eta$$

where, η is the level of threshold.

Hybrid Algorithm

This algorithm is used to determine the optimum value of η . Here we consider a set of values of η , and determine the price that the media content supplier hopes to pay to the cloud supplier for all spilling asset designated in the cloud utilizing hybrid approach.

$$C_{\text{hybrid}} = \sum_j (C_{RSVj} + C_{ODj})$$

where, C_{RSVj} is the price charged for the reserved resources in every window j using reservation plan which is given by,

$$C_{RSVj} = w_j \cdot \text{tariff}(w_{RSVj}, \text{Alloc}_{RSVj})$$

and C_{ODj} is the expected cost of resources allocated in the cloud during every window j using on-demand plan, which is given by,

$$C_{ODj} = w_j \cdot \int_{\text{Alloc}_{RSVj}}^{\infty} f(x) \cdot \text{tariff}(x - \text{Alloc}_{RSVj}) dx$$

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(An ISO 3297: 2007 Certified Organization)

Vol. 5, Issue 5, May 2016

where, probability density function of x is given by,

$$f(x) = \frac{1}{x\sigma\sqrt{2\pi}} e^{\left(-\frac{1}{2}\right)\left(\frac{\ln(x)-\mu_{\max}}{\sigma}\right)^2}$$

III. EXPERIMENTAL RESULTS

Fig.2: Displays the login page where the user can first click on the registration button, registers and then logs in using the user name and password.



Fig.3: Shows registration page where the user enters the necessary details like gmail id, password, username, gender, phone number, address and country name and creates an account.



Fig.4: User sign in and click on the view mediafiles button, it displays the videos which are present in the media content provider's database.



When the user views the media files present in the media provider's database, select a media file which is to be uploaded. Click on the selected video and then click on the upload button which is to be uploaded. Once clicked on upload, a dialog box is appeared displaying that the file is uploaded successfully.

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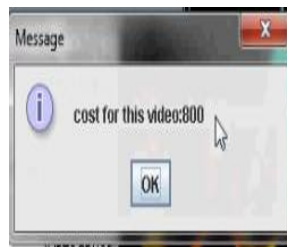
Vol. 5, Issue 5, May 2016

Fig.5: Shows a dialog box indicating that the video which has been selected by the user is uploaded successfully.



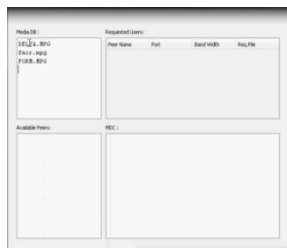
Once we click on the ok button, the cost of tht particular video will be displayed in the form of another dialog box.

Fig.6: Displays the cost for that particular uploaded video.



In this way multiple videos from the media content supplier can be uploaded to the cloud and the cost for each of the video can be determined. Now as a user we can request for any of the videos uploaded previously.

Fig.8: Shows the videos that are uploaded to the cloud.



After viewing the videos present in the cloud the user can request for a particular video by specifying the name of the video and clicking on the request button.

International Journal of Innovative Research in Science, Engineering and Technology

(An ISO 3297: 2007 Certified Organization)

Vol. 5, Issue 5, May 2016

Fig.9: User requesting for a particular video by specifying the particular videos name and clicking on the request button.



Fig.10: Depending upon the size of the video, number of peers will be connected. Then when all the peers are connected, user clicks on the 'play received file' then the requested video is played.



IV. CONCLUSION

It has been demonstrated that the proposed calculations ideally decide both the measure of saved assets in the cloud and their reservation time, based on forecast of future interest for streaming capacity, such that the related cost on the media content supplier is reduced. The proposed algorithms exploit the time decreased rates in the tariffs, while making sure that enough resources are held in the cloud without incurring wastage. We have assessed the execution of our calculations numerically. The results show that our algorithms adjust the trade-off between assets saved on the cloud and assets designated on-demand. We have considered two distinctive clouds, Amazon EC2 and Dropbox to observe execution of our algorithms in both the clouds. In future we might likewise research the instance of other cloud suppliers to consider the business sector rivalry while allocating resources in the clouds and also compare the quality of service provided by each of them and determine the best cloud provider.

REFERENCES

- [1] Y. Liu, Y. Guo, and C. Liang, "A survey on peer-to-peer video streaming systems," in *Peer-to-Peer Networking and Applications*, vol. 18, no. 1, pp. 18–28, 2008.
- [2] Cisco Systems Inc., "Data center virtualization and orchestration: Business and financial justification," white paper, 2007.
- [3] Cisco Systems Inc., "Cisco visual networking index: Forecast and methodology, 2010-2015," white paper, 2010.
- [4] Four Reasons We Choose Amazons Cloud as Our Computing Platform, *The Netflix Tech Blog*, Dec., 2010.