Media Streaming Application Using Cloud

Swapnil Jadhav[1], Shubham Sawant[2], Sourabh Kamble [3], Vasudeo Kakade [4]

[1234]Student, B.E. Information Technology, JSCOE Pune, Maharashtra, India

---

Abstract - *In today's world Media streaming applications have attracted a large number of users in the Internet. Use of bandwidth related applications, it is inefficient to provide streaming distribution with guaranteed QoS relying only on central resources at a media content provider. It offers an elastic infrastructure that media content providers for e.g. Video on Demand (VoD) providers use to obtain streaming related resources that would match the demand. The Media providers charge for the amount of resources allocated (reserved) in the cloud. Many existing cloud providers use a pricing model for the resources which are reserved which is based on non-linear time-discount tariffs for e.g., Amazon Cloud Front EC2. A pricing scheme offers discount rates depending non-linearly on the period of time during which the resources are reserved in the cloud. In this problem occurs is that how we can decide whether the right amount of resources are reserved in the cloud and also check the reservation time such that the financial cost on the media content provider is minimized. We propose a simple and easy to implement algorithm for reservation of resources that maximally exploits discounted rates offered in the tariffs and also ensure that sufficient resources are reserved in the cloud.*

***Key Words*: Cloud Computing, Media Streaming, PBRA, Secret Key.**

1. INTRODUCTION

Cloud Computing is used as a delivery and storage capacity as a service to a community of end recipients. This name usually comes from the use of a cloud shaped symbol. It is an abstraction for the complex infrastructure. It is contained in system diagrams. Cloud computing mostly uses services with a user's data, software and computation over a network. There are different types of cloud -
1. Public Cloud
2. Private Cloud
3. Hybrid Cloud
4. Community Cloud
Media Streaming is a type in which different types of media is constantly received by and presented to an end user which is being delivered by a provider. Now a day's streaming of videos online has been in great demand. Almost every user watch the videos online but many a times it is difficult to watch the video without buffering as it is delivered directly from the centralized data servers and on this servers multiple user tries to watch the video online at the same time and it puts loads on the servers so sometime many users couldn't watch it properly gets started with the buffering or also sometimes it is unable to access the video. For example YouTube provides millions of videos to watch but however it takes more time for streaming because of many demands at time for a particular video. To overcome this problem, in our system, we are making the use of cloud in which we are going to store the videos and audio files and we are going to provide the user with the android app and also the web based application in which user have to register to get access to our services and would not have to pay for the cloud services thus saving the cost. Our main focus is to provide users with continuous streaming of videos without any buffering issues and also to save their money and provide them with good quality and high bandwidth videos.

1.1 Cloud Computing

Cloud Computing is used as a delivery and storage capacity as a service to a community of end recipients. This name usually comes from the use of a cloud shaped symbol. It is an abstraction for the complex infrastructure. It is contained in system diagrams. Cloud computing mostly uses services with a user's data, software and computation over a network. There are different types of cloud -
1. Public Cloud
2. Private Cloud
3. Hybrid Cloud
4. Community Cloud

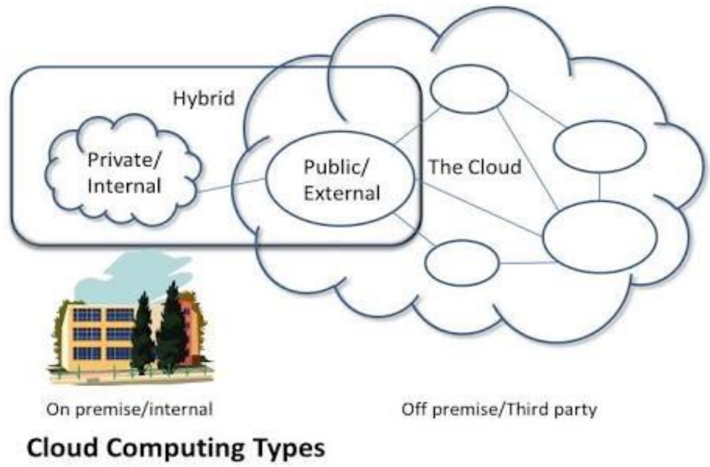


Fig 1.1: Cloud Computing

1.2 Media Streaming

Streaming media is multimedia in which different types of media is constantly received by and presented to an end-user while being delivered by a provider. It is provided to the end user in a continuous form from a specific provider where the user request and it is provided in a medium.

1.3 PBRA Algorithm

This algorithm minimizes the monetary cost of resource reservation in the cloud by maximally exploiting discounted rates offered in the tariffs, while ensuring that sufficient resources are reserved in the cloud with some level of confidence in probabilistic sense.

Input: PM: all the physical machines.
VM: all the virtual machines.
Output: Migration Schedule.

1. Resource Confliction Prediction Phase;
2. Let Busy be the set of PMs which is migrating VMs;
3. Let Available be the set of PMs which holds vms but has no migration action;
4. Let Idle be the set of the rest PMs
5. for all pms in Available do
6. Tc = Conflict Predict (pmi, kstep);
7. ifTcnotequal − 1then
8. vmx = MoveOutVMDetermination (pmi, Tconflict)
9. Add vmx to ToMigrateList;
10. Remove vmx fromAvailable;
11. end
12. end
13. ResourceConsolidationP hase;
14. for all vmi in ToMigrateListdo
15. Pick up vmi with the smallestTc;
16. Let pms our be the pmwhich hold vmi;
17. pmdes = handleConflict(vmi)
18. if pm does not equal NULL then
19. Add (vmi− > pmdes) into MigrationSchedule;
20. Move pm desand pmi to Busy;
21. Delete vmi from ToMigrationList;
22. end
23. end
24.Sort the pmin Available in descending order by their predicted load situation state;
25. whileAvailablesize () notequal0do
26.Pick the last pmi in Available which is also the lightest loaded;
27. Pick the lightest loaded vmi in pmi;
28. whilepmt! = Availableend()do
29.if pmt has enough spare space to hold vmi without conflicts then
30. Add (vmi− > pmt)intoMigrationSchedule;
31. Move pmt from Available to Busy;
32. Add pmt to Busy;
33. break;
34. else
35. Let pmt be the next one in Available;
36. end
37. end
38. Remove pmi from Available;
39. end
40. return Migration Schedule;

1.4 Related Work

[1] Seematai S. Patil, Koganti Bhavani, Dynamic Resource Allocation using Virtual Machines for Cloud Computing Environment , International Journal of Engineering
and Advanced Technology (IJEAT) ISSN: 2249 – 8958,Volume-3 Issue-6, August 2014.

In this paper, system is been implemented that uses virtualization technology to allocate data center resources dynamically based on application demands and support green computing by optimizing the number of servers in use. The concept of "skewness" to measure the unevenness in the multi-dimensional resource utilization of a Server. By minimizing skewness, combine different types of workloads nicely and improve the overall utilization of server resources.

[2] D. Niu, H. Xu, B. Li, and S. Zhao, "Quality-Assured Cloud Bandwidth Auto-Scaling for Video-on-Demand Applications" in Proc. of IEEE Infocom Conference, pp.(Year: 2012)

In this paper, The scenario is that a VoD provider can make reservations for bandwidth guarantees from cloud service providers to guarantee the streaming performance in each video channel. They propose a predictive resource auto-scaling system that dynamically books the minimum bandwidth resources from multiple data centers for the
VoD provider to match its short-term demand projections.

[3] G. Gursun, M. Crovella, and I. Matta, "Describing and Fore-casting Video Access Patterns," in Proc. IEEE Infocom Mini-Conference, pp. 16–20.(Year:2011)

Computer systems are increasingly driven by work-loads that reflect large-scale social behavior, such as rapid changes in the popularity of media items like videos. In this paper they have differentiated two types of videos one is the in which those show rapid changes in popularity and the other is the consistently popular over long period
of times. In this dataset, we find that there are two types of videos: those that show rapid changes in popularity, and those that are consistently popular over long time periods. We call these two types rarely-accessed and frequently-accessed videos, respectively. To answer these questions we develop two different frameworks for characterization
and forecasting of access patterns. We show that for frequently-accessed videos, daily access patterns can be extracted via principal component analysis, and used efficiently for forecasting. For rarely-accessed videos, we demonstrate a clustering method that allows one to classify bursts of popularity and use those classifications
for forecasting.

[4] S. Peichang, W. Huaimin, Y. Gang, L. Fengshun, and W. Tianzuo,"Predictionbased Federated Management of Multi-scale Resources in Cloud," in AISS: Advances in Infor-mation Sciences and Service Sciences, vol. 4, no. 6, pp. 324–334.(Year:2012)

The connotation of the cloud resources have been extended to be multi-scale resources, which includes central resources as presented by data center, edge resources as presented by Content Delivery Network (CDN) and end resources as presented by Peer-to-Peer (P2P). Under the development situation of the scale of the cloud services, it is difficult to provide services (e.g. streaming distribution) with guaranteed QoS only relying on single type of resource (e.g. central resources) to geo-distributed users. Therefore, making multi-resources cooperative to provide reliable services is necessary. However, it is a great challenge to realize Federated Management of Multiscale Resources (FMMR).

In this research, we propose the idea of prediction-based FMMR, and present the problem formulation introducing economic profit from the perspective of CDN operators. Then, we present the method of Time-series Prediction based on Wavelet Analysis (TPWA) to predict the resource requirements of streaming cloud services in CDN. Finally, the predictability of the resource requirement pattern of the streaming cloud service and the effectiveness of our proposed method have been verified, based on the traces collected from a real CDN entity.

2. SYSTEM ANALYSIS

2.1 Problem Definition

Huge demand creates load on centralized data centers so it's a challenge to provide the HD video on their demands with high bandwidth. So here we are trying to provide HD videos from different cloud servers to release load on cloud server.

In some case user will try to find the solution in less time. Some web site provides the video not always in HD quality also not in continuous way. So to avoid the buffering time in our project we are trying to avoid the buffering and provide continuous streaming data saving cost of internet.

2.2 Proposed System.

In the existing system, we found out that users are unable to get proper service for media streaming facing the problems of buffering, slow-connection, wastage of time and money as it requires lot of data tariff to use these services.

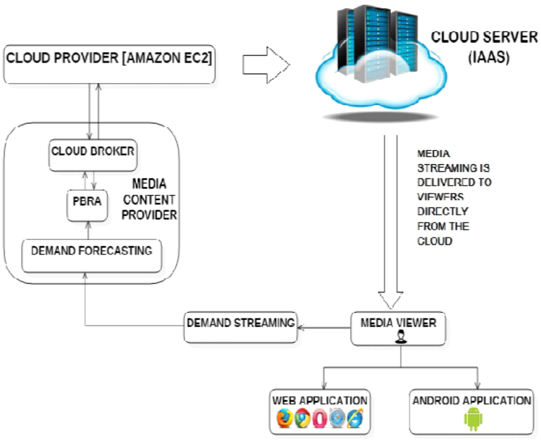


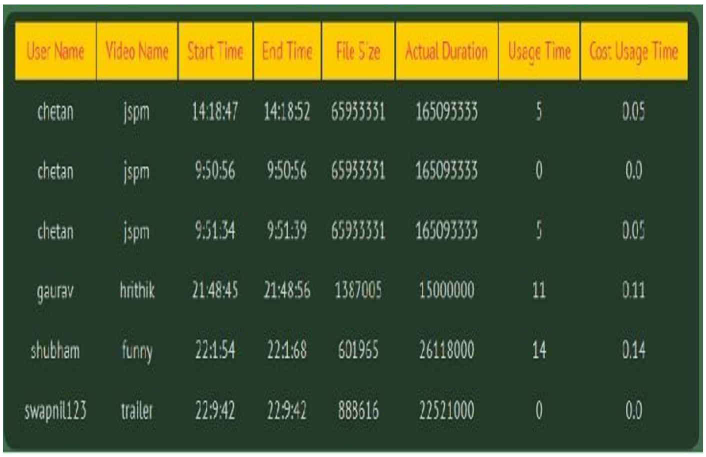
Fig 1.2: Proposed System.

So we are proposing a system that uses cloud as a storage resource for media streaming i.e. Cloud, where all the media resources will be stored with the purpose of reducing the wastage of memory, storing only right amount of resources and reducing the financial cost on media content provider. Our main motive is to remove the drawbacks from the existing system and for that we are going to develop a web based as well as android application and also the use of PBRA algorithm with which the cost of reserved resources would be minimized and the user will not have to pay for the cloud services as it will be free of cost and also provide the security because of using the private cloud so that no third party can access it. User should register to the services when he registers password will be automatically generated in which half of the password key will be sent to your mail thus it will be secured so no one can stole it. An android application will make it easy for users to access the videos easily and without buffering.

3. RESULT

2.3.1 On-Demand User

After successful watching High Definition Video user will end session. When user clicks on session out button the Media Streaming Application will calculate cost as per usage of user.

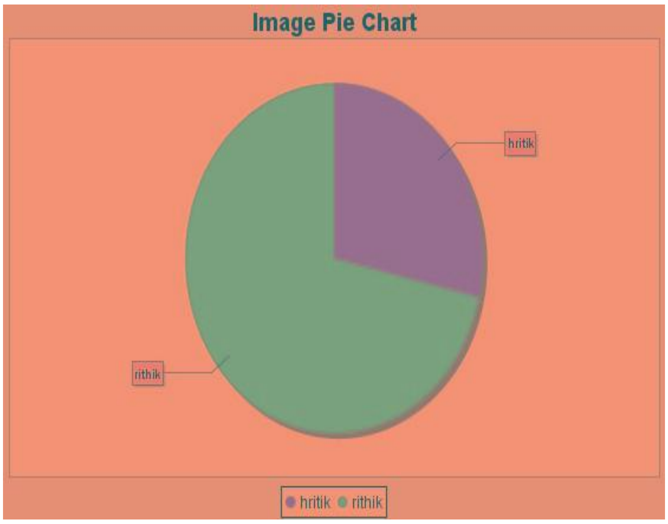


User Name	Video Name	Start Time	End Time	File Size	Actual Duration	Usage Time	Cost Usage Time
chetan	jspm	14:18:47	14:18:52	65933331	165093333	5	0.05
chetan	jspm	9:50:56	9:50:56	65933331	165093333	0	0.0
chetan	jspm	9:51:34	9:51:39	65933331	165093333	5	0.05
gaurav	hrithik	21:48:45	21:48:56	1387005	15000000	11	0.11
shubham	funny	22:1:54	22:1:68	601965	26118000	14	0.14
swapnil123	trailer	22:9:42	22:9:42	888616	22521000	0	0.0

Fig 1.3: Usage Cost Of On-Demand User.

The cost of user will calculated as, 0.01 paisa/second. This cost will display to the user. It will Display result as User Name, Video Name, Start Time, End Time, File Size, Actual Duration, Usage Time, Cost Usage Time.

2.3.2 Pie Chart



This Pie chart shows that the cloud containg videos and how many times user can watch these video the count will increase and according to this it will show that how many times video can see by the users.

.

4. CONCLUSION

In our system, the problem of resource allocations in the cloud for media streaming applications. We have considered non-linear time-discount tariffs that a cloud provider charges for resources reserved in the cloud. We have used the algorithm that optimally determine both the amount of reserved resources in the cloud and their reservation time - based on prediction of future demand for streaming capacity - such that the financial cost on the media content provider is minimized. The algorithms is being used to exploit the time discounted rates in the tariffs, while ensuring that sufficient resources are reserved in the cloud without incurring wastage. We have evaluated the performance of our algorithms numerically and using simulations. The results show that our algorithms adjust the trade-off between resources reserved on the cloud and resources allocated on-demand.

3.1 Future Work

In future work, we shall perform experimental measurements to characterize the streaming demand in the Internet and develop our own demand forecasting module. We shall also investigate the case of multiple cloud providers and consider the market competition when allocating resources in the clouds.

Also in our project we provide only video to the users. But in future work we can add audio, text file.

ACKNOWLEDGEMENT

The satisfaction that accompanies the successful completion of any task would be incomplete without mentioning the people who make it possible. I'm grateful to a number of individuals whose professional guidance along with encouragement have made it very pleasant endeavor to undertake this project report. I have a great pleasure in presenting the project " Media Streaming Application using Cloud " under the guidance of Prof. S.U.Ayachit.

I'm truly grateful to project guide Prof.S.U.Ayachit for their valuable guidance and encouragement. Her encouraging words went a long way in providing the patience and perseverance, which were needed to complete this project successfully. I would like to express my gratitude to Dr. M.G.Jadhav, Principal of Jayawantrao Sawant College of Engineering and Prof. S.V.Todkari, Head of Department of Information Technology for their support and guidance.

REFERENCES

[1] Seematai S. Patil, Koganti Bhavani, Dynamic Resource Allocation using Virtual Machines for Cloud Computing Environment , International Journal of Engineering and Advanced Technology (IJEAT) ISSN: 2249 – 8958,Volume-3 Issue-6, August 2014.

[2] D. Niu, H. Xu, B. Li, and S. Zhao, "Quality-Assured Cloud Bandwidth Auto-Scaling for Video-on-Demand Applications" in Proc. of IEEE Infocom Conference, pp.(Year: 2012)

[3] M. J. Freedman, E. Freudenthal, and D. Mazieres, "Democratizing content publication with coral," in Proc. Of the 1st conference on symposium on Networked System Design and Implementation, vol. 1, pp. 239-252, 2004.

[4] G. Gursun, M. Crovella, and I. Matta, "Describing and Fore-casting Video Access Patterns," in Proc. IEEE Infocom Mini-Conference, pp. 16–20.(Year:2011)

[5] W. Zhu, and C. Luo and J. Wang and S. Li, "Multimedia Cloud Computing," in IEEE Signal Processing Magazine , vol. 28, no. 3, pp. 59–69.(Year:2011)

[6] Cisco System Inc., "Cisco visual networking index: Forecast and methodology, 2010-2015," white paper, 2010

[7] Amazon EC2 Reserved Instances, http://aws.amazon.com/ec2/reserved-instances, 2012

[8] Cloud Computing, https://en.wikipedia.org/wiki/Cloud Computing.

[9] Amazon CloudFront, http://aws.amazon.com/cloudfront/, 2012.

[10] E. white, M. O'Gara, P.Romanski, P. Whitney, "Cloud Pricing Models," in cloud Expo: Article,white paper, 2012.
http://java.sys-con.com/node/2409759?page=0,1.

[11] GoGrid, http://www.gogrid.com, 2012.

[12] M. Cha, H.Kwak, P.Rodrigguez, Y-Y Ahn, and S. Moon, "I tube, you tube, everybody tubes: analyzing the world's largest user generated content video system, "in Proc. Of the ACM SIGCOMM Conference, pp. 1-14, 2007.

[13] S. Chaisiri, B-S Lee, and D. Niyato, "Optimization of Resource Provisioning Cost in cloud Computing," in IEEE Transactions on services Computing, vol. 5, no. 2, pp. 164-177, 2012.

[14] http://www.octoshape.com/

[15] A. Micah, K. S. Ramesh, and V. Harish, "Algorithms for optimizing the bandwidth cost of content delivery," in Elsevier Computer Networks, vol. 55, no.18, pp. 4007-4020, 2012.

[16] T. Hobfeld, R. Schatz, M. Varela, and C. Timmerer, "Challenges of QoE management for cloud application," in IEEE Communications Magazine, vol. 50, no. 4, pp.

BIOGRAPHIES

Swapnil M. Jadhav pursuing Bachelor of Engineering in Information Technology, JSCOE Hadapsar, Pune.

Shubham G. Sawant pursuing Bachelor of Engineering in Information Technology, JSCOE Hadapsar, Pune.

Sourabh R. Kamble pursuing Bachelor of Engineering in Information Technology, JSCOE Hadapsar, Pune.

Vasudeo O. Kakade pursuing Bachelor of Engineering in Information Technology, JSCOE Hadapsar, Pune.