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Cloud Based Interactive Mobile Multimedia Streaming

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Abstract -This paper investigates the issues of delay while downloading the multimedia file from cloud space. The main concept of this paper is to analyze the unexpected interruption of user device and automatic resumption from cloud. Multimedia information can be accessed easily using mobile devices permitting us to enjoy pervasive network services. Considering the users device and network limitation , I propose a system that should be network and device aware QoS method .The proposed system reduces the delay and provides a suitable multimedia data format for the device from cloud space by interacting with users device when they request for a particular multimedia file. We investigate to implement this concept by doing the hardware feature experiment and video quality experiment. Cloud lets us to store, convert and download multimedia files in a number of formats so that download speed and quality will be increased.

***Index Terms*- multimedia, Cloud Computing, SVC, Interactive Streaming.**

I. INTRODUCTION

Internet access is booming as a commodity on mobile devices .With the smart phones, smart books, connected notebooks and laptops the mobile internet is becoming huge. To meet the great opportunities and challenges coming along with media revolution [1] [2], the new technology and fundamental facilities with more powerful capability have become the most urgent demands. Simultaneously the adjustments of commercial model and industry strategy are automatically necessary to adapt these changes. At the same time mobile users expect high-quality video experience in terms of video quality, start-up time, reactivity to user interaction, trick mode support etc., and the whole ecosystem including content providers ,device manufacturers, network operators, content providers need to ensure these demands can be met. Affordable and mature technologies are required to fulfill the user's quality expectations. Cloud computing has become the development trend of the internet. Massive amounts of data are calculated simultaneously and user demands are met rapidly, based on the architecture of cloud resource virtualization. The basic technique of cloud computing is derived from distributed computing and grid computing [9]. Recently cloud based streaming concept has been a noticeable trend in multimedia streaming service. Users can access contents in the cloud from any computer or device connected to the Internet without the need to save files to their devices [10]. Since the appearance of the cloud multimedia concept, many studies have been analyzed and researched cloud computing. Many researchers focus on the design of methods for increasing efficacy according to multimedia content. These designed methods facilitate multimedia data analysis using cloud computing, and multimedia data search can allow users to quickly obtain desired files. However studies on analysis and search of multimedia files reduce the amount of calculation required by users to analyze and search multimedia files.

II. RELATED WORK

Media cloud [3] or Multimedia cloud [4] [5] hereby presents when media revolution meets the rise of cloud computing. The emergence of media cloud not only has great impact on the related research and technologies such as architecture of the cloud computing platform, media processing, storing, delivery, and sharing, but also has profound impact on the commercial model, industrial strategy, and even the society. Over the past decade, increasingly more traffic is accounted by video streaming and downloading. In particular, video streaming services over mobile networks have become prevalent over the past few years. While the video streaming is not so challenging in wired networks, mobile networks have been suffering from video traffic transmissions over scarce bandwidth of wireless links. Despite network operators desperate efforts to enhance the wireless link bandwidth (e.g., 3G and LTE).Soaring video traffic demands from mobile users are rapidly overwhelming the wireless link capacity[4][11]. While receiving video streaming traffic via 3G/4G mobile networks, mobile users often suffer from long buffering time and intermittent disruptions due to the limited bandwidth and link condition fluctuation caused by multi-path fading and user mobility. Thus, it is crucial to improve the service quality of mobile video streaming while using the networking and computing resources efficiently. No matter what the service is users will always expect powerful, sound and stable functions. For multimedia videos stability is of the greatest importance. Therefore, how to execute smooth playback with limited bandwidth and the different hardware specifications of mobile streaming is an interesting challenge. H.264/SVC [6] is an extended coding and decoding architecture based on H.264/AVC. The benefit of H.264/SVC is that it can adjust the image quality dynamically, accordingly to the bandwidth of the receiving end. This research targets the characteristic of streaming protocols to record the current stream video content and the bandwidth state of the user while also analyzing the past bandwidth fluctuations to evaluate and predict the possible bandwidth changes in the future while using the map reduce algorithm in cloud computing to immediately transfer the video encoding to quickly transfer the most suitable video format for the user.

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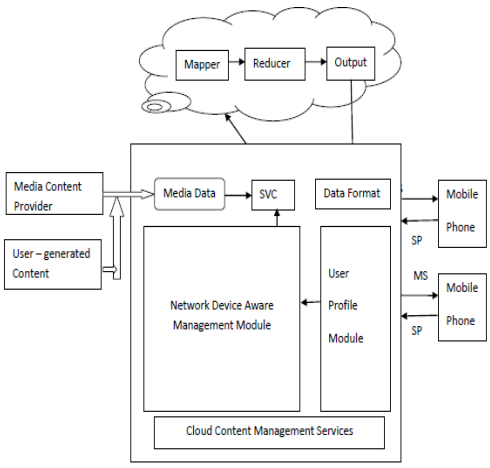
III. PROPOSECD SYSTEM STRUCTURE AND MODULES DEFINITION PROPOSED SYSTEM STRUCTURE

In this system when a user wants to download a particular multimedia file from cloud server first they need to register their information (First Name, Last Name, Mail id) with that cloud. If they are an existing user their information are retrieved from cloud database otherwise the information will be stored with cloud database. After registration the user device and network characteristics will be calculated then a user can select required multimedia file from cloud space. Based on the device and network characteristics suitable media file will be transferred to the terminal device, here we use SVC for suitable media file conversion for the end device.SVC plays a important role which uses 2 layers namely base layer, enhance layer[7]. Each media file has base layer for its basic image quality depends on the network fluctuations SVC adds number of enhance layer for its higher quality. If any interruption happens to break the download operation, the proposed system will resume this function from problematic state. These recovery operations implemented in cloud space which supports the user can access the same media file download from the interrupted state by using same device.



MS – MultiMedia Stream

SP – Schema Profile

Fig 1 - Proposed System Architecture

Advantages of proposed system

- Reduced delay and faster Access
- Resume from any device by using same id
- Cloud Space utilization
- Effective resource utilization
- Efficient power management
- Clear Video quality management Improve overall System Performance
- System consistency

IV. IMPLEMENTATION

The proposed system has number of modules that are described below,

- ✓ Network and Device Parameter calculation
- ✓ Cloud data storage
- ✓ Request and frequency setting
- ✓ Adaptive communication
- ✓ Resumption

Network and Device Parameter calculation

Here we calculate band width, device model and network provider, network type and SIM state. If the device used already means, we can extract all details from database except the bit rate and band width. We use three type of band width namely, tested exiting, Average available and Standard deviation to calculate current bandwidth. When this parameter form is maintained, the parameters can be transmitted to the network estimation module and the device-aware Bayesian prediction module for relevant prediction.

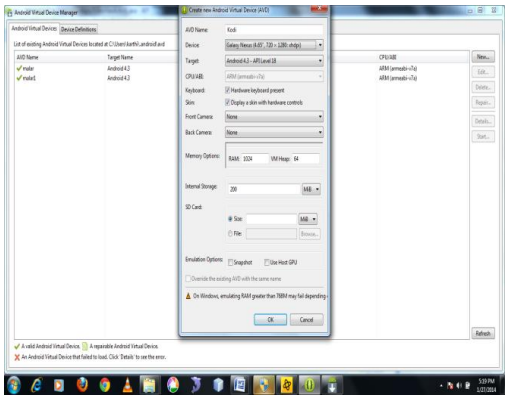


Fig 2 – Android Virtual Device Creation

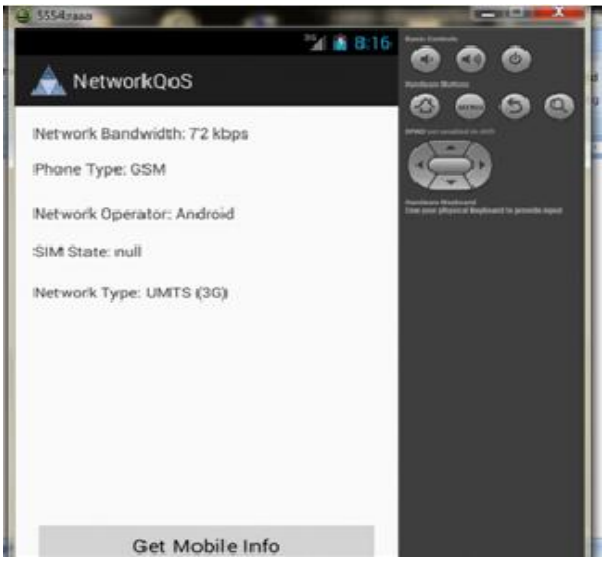


Fig 3 – Device and Network Parameter Calculation

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Cloud data storage

In this module we stored different types of videos and mobile information , because the users can request any videos from different kind of mobiles, so we need to store all videos in cloud, it provides a simple services interface that can be used to store and retrieve any amount of data, at any time, from anywhere on the server. It gives any developer access to the same highly scalable, reliable, secure, fast, inexpensive infrastructure that cloud uses to run its own global network. The service aims to maximize benefits of scale and to pass those benefits on to users. Once cloud user send video to cloud , that video stored below types bit rate , band width , width, height, standard deviation, decoding and encoding. When the prediction error is greater than error boundary, the system shall reduce the weight modification of the predicted difference; relatively, when the prediction error is less than error boundary, the system shall strengthen the weight modification of the predicted difference. When the changed bandwidth of the system is greater than the standard difference, the predicted weight will increase as the corrected value of the standard deviation is reduced.

Request and frequency setting

In this module we implement video analysis, because this project contain retrieve video from cloud and compare device. So in this cloud process we store video from three separate file. First one video feature to find frame rate, bit rate and Resolutions. Second one Inference case, to find decoding of video or encoding of video, playback file completed or not. At last Device feature, to find power consumption, device model, device network. Hereby, in order to conform to the real-time requirements of mobile multimedia, this study adopted Bayesian theory to infer whether the video features conformed to the decoding action. The inference module was based on the following two conditions: The LCD brightness does not always change this hypothesis aims at a hardware energy evaluation. The literature states that TFT LCD energy consumption accounts for about 20%–45% of the total power consumption for different terminal hardware environments [8]. Although the overall power can be reduced effectively by adjusting the LCD, with multimedia services, users are sensitive to brightness; they dislike video brightness that repeatedly changes. As changing the LCD brightness will influence the energy consumption evaluation value, the LCD brightness of the mobile device is assumed to not able to change at will during multimedia service. The energy of the mobile device shall be sufficient for playing a full multimedia video full multimedia service must be able to last until the user is satisfied.

Adaptive communication

Multimedia data over the cloud can be stored in different format that may or may not be compatible with the device. Transcoding operation is performed in order to enable all devices to access different formats of data and convert that to a compatible format. We implement K-means clustering algorithm for multimedia noise removal. This algorithm partitions the group of data into small clusters and reduces noise.

Resumption

While downloading a multimedia file from cloud, when there occurs an emergency condition that tends us to stop the process abruptly, it can be resumed from the point in cloud where it was stopped. The user profile being mapped and stored in the cloud before a downloading process. When there occurred an unfortunate disconnection and the download being interrupted, it can be resumed from the point at which it was interrupted. This is achieved by keeping an updated record of the download progress and mobile and device information that is used for mapping over the cloud. The user when get back to the cloud the download status the network and device profile that is stored in the cloud is used to know about the extent to which the download has progressed and it is resumed. If the user logs in to the cloud with a different device the download is initiated from the beginning.

V. CONCLUSION

For mobile multimedia streaming services, how to provide appropriate multimedia files according to the network and hardware devices is an interesting subject. In this study, cloud based interactive mobile streaming and automatic resume by checking cloud information regarding user request was proposed. The Network and Device parameter calculation and cloud storage were used for the prediction of network and hardware features, and the communication frequency and SVC multimedia streaming files most suitable for the device environment were determined according to these two modules. In the experiment, the overall prototype architecture was realized and an experimental analysis was carried out. In the future work, we will carry out large-scale implementation and with serious consideration on energy and price cost. Cloud services may accelerate research on SVC coding in the future.

REFERENCES

[1] “Moving to the Media Cloud for Data and Content Integration Management “-Zulfikhar Ahmad1, Ashis Kumar Mishra2,Asisha Kumar Jena3,Department of Computer Application, College of Engineering &Technology ,Bhubaneswar-751003, Odisha, India.

[2] M. F. Tan and X. Su, “Media cloud: When media revolution meets rise of cloud computing,” in Proc. IEEE 6th Int. Symp. Service Oriented Syst. Eng., 2011, pp. 251–261.

ISSN: 2277-3754
ISO 9001:2008 Certified
International Journal of Engineering and Innovative Technology (IJEIT)
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[3] D. Diaz-Sanchez, F. Almenarez, A. Marin, D. Proserpio, and P. A.Cabarcos, "Media cloud: An open cloud computing middleware for content management," IEEE Trans. Consum. Electron., vol. 57, pp.970–978, 2011.

[4] A. Khan and K. K. Ahirwar, "Mobile cloud computing as a future of mobile multimedia database," Int. J. Comput. Sci. Commun., vol. 2, no. 1, pp. 219–221, 2011.

[5] S. M. Saranya and M. Vijayalakshmi, "Interactive mobile live video learning system in cloud environment," in Proc. Int. Conf. Recent Trends in Inf. Technol. (ICRTIT), 2011, pp. 673–677.

[6] P. Chen, X. Jeongyeon, L. B. Lee, M. Kim, S. Hahm, B. Kim, and K.L. Park, "A network-adaptive SVC streaming architecture," in Proc.Int. Conf. Advanced Commun. Technol., 2007, vol. 2, pp. 955–960.

[7] "AMES-Cloud: A Framework of Adaptive Mobile Video Streaming and Efficient Social Video Sharing in the Clouds" Xiaofei Wang, Student Member, IEEE, Min Chen, Senior Member, IEEE, Ted "Taekyoung" Kwon, Senior Member, IEEE, Laurence T. Yang, Senior Member, IEEE, Victor C.M. Leung, Fellow, IEEE.

[8] Y. K. Lai, Y. F. Lai, and P. Y. Chen, "Content-based LCD backlight power reduction with image contrast enhancement using histogram analysis," J. Display Technol., vol. 7, no. 10, pp. 550–555, 2011.

[9] M. Armbrust, A. Fox, R. Griffith, A. D. Joseph,R.Katz, M. Zaharia, "A view of cloud computing," Commun. ACM, vol.53, p.508, Apr.2010.

[10] S. Y. Chang, C. F. Lai, and Y. M. Huang, "Dynamic adjustable multimedia streaming service architecture over cloud computing," Comput. Commun. vol. 35, no. 15, pp. 1798–1808, Sep. 2012.

[11] P.MALARKODI, A.PUNITHA ANGEL MARY are pursuing their Masters in Pervasive Computing Technologies in Kings College of Engineering Affiliated to Anna University. Area of interests includes Cloud Computing, Cloud Security, and Networking.

[12] A. Khan and K. K. Ahirwar, "Mobile cloud computing as a future of mobile multimedia database," Int. J. Comput. Sci. Commun., vol. 2, no.1, pp. 219–221, 2011.