Media Revolution in Cloud Computing Based on Mobile Streaming

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Abstract
Cloud transmission services supply associate economical, flexible, and ascendible process technique and provide a solution for the user demands of high quality and diversified transmission. As intelligent mobile phones and wireless networks become further and a lot of commonplace, network services for users are no longer restricted to the house. Transmission data are obtained merely victimisation mobile devices, allowing users to fancy ubiquitous network services. Considering the restricted system of measurement accessible for mobile streaming and utterly completely different device desires, this study given a network and device-aware Quality of Service (QoS) approach that has transmission data applicable for a terminal unit surroundings via interactive mobile streaming services, additional considering the overall network surroundings and adjusting the interactive transmission frequency and conjointly the dynamic transmission transcoding, to avoid the waste of knowledge live and terminal power. Finally, this study complete a model of this style to validate the utility of the projected technique. in line with the experiment, this system could supply economical self-adaptive transmission streaming services for various system of measurement environments.

Keywords
Wireless Networks, Streaming, Transcoding

I. Introduction

CLOUD computing has become the event trend of the web. giant amounts of data unit calculated at the same time and user demands unit met quickly, supported the design of cloud resource virtualization. The essential technique of cloud computing springs from distributed computing and grid computing. In recent years, as mobile devices have developed apace, users square measure able to access network services anywhere and at anytime. significantly with the event of 3G and 4G networks, transmission services became universal application services. The media cloud is associate extended technology developed to meet the fast-changing information business and user's demand for higher transmission quality and varied terminal units. It realizes transmission computing, space for storing configuration, and sharing services supported the powerful arithmetic capability of cloud computing. As intelligent mobile devices and transmission technology have begun to popularize, the general public has began to use mobile devices like intelligent mobile phones or tablets to appear at transmission videos by means that of streaming . usually speaking, accessing transmission video services through networks is not any longer a haul. the most important video platforms, like Youtube and Amazon, have smart management styles and provide users to share transmission videos merely with heterogeneous services. in spite of what the service is, users will invariably expect powerful, sound and stable functions. For transmission videos, stability is of the most effective importance. Users expect to appear at videos smoothly and at a precise level of quality, in spite of what changes occur inside the network setting. However, the prevailing video platforms usually provide inconsistent playback, ensuing from the fluctuation of network on-line quality, particularly with mobile devices, that have restricted system of measurement and terminal unit hardware resources. as a result of the vary of network users is quickly increasing, system of measurement insufficiency will occur then network transmission services square measure aiming to be affected considerably. Differing from general services that have a high acceptance rate for packet loss, transmission packets emphasize the correctness, sequence order and amount nature of packets. once a transmission video service is applied, the service quality declines greatly whereas trying to meet the strain of video transmission. Users usually browse live videos that freeze have intermittent sound, or even failure to regulate. Therefore, a way to execute swish playback with restricted system of measurement and additionally the various hardware specifications of mobile streaming is associate attention-grabbing challenge.H.264/SVC is associate extended committal to writing and cryptography style supported H.264/AVC. The advantage of H.264/SVC is that it'll modify the image quality dynamically, per the knowledge live of the receiving end. The draft was planned in April of 2004 and was elite in New Style calendar month of 2007. SVC puts forward a spic-and-span stratified style. This hierarchical arrangement will perceive the quality of temporal, spatial and quality dimensions. The spirit of SVC is that the receiving end is absolute to receive image packets of the bottom quality for cryptography. The image layer with the bottom quality is termed the lowest layer. the bottom layer of SVC is completely compatible with H.264/AVC, and once there is enough system of measurement to receive image packets with higher quality, the decoder will do reference cryptography per the received packets, that's to say, top quality image packets cannot resolve photos independently; the image packet of the lowest layer ought to be consulted for cryptography.

In terms of the quality of the three dimensions, SVC uses the stratified B-picture methodology to know temporal quality, down/up sampling filters and inter-layer prediction to know spatial quality, and signal/noise (SNR) quality and associate Metal Gear Solid (MGS) Codec to know quality quality. The quality of hierarchies inside the video is also determined throughout the course of secret writing. additionally, interactive mobile transmission services communicate and coordinate the mobile device with the server-side to pick the transmission file applicable to the device atmosphere (bandwidth, resolution and arithmetic capability) , therefore on notice associate optimum transmission streaming service. This previous study projected associate interactive mobile transmission service over cloud computing, within the previous service, the mobile device side exchanges information with the cloud atmosphere, thus on make sure associate optimum transmission video. Students have done varied researches toward typical platform (CDN) to store all totally different picture show formats in an exceedingly transmission server, to decide on the right video stream per this network state of affairs or the hardware calculation capabilities. to resolve this drawback, many researches have tried dynamic cryptography to transfer media content, however still cannot offer the foremost effective video quality. this can be often as a results of the time overwhelming proven fact that ancient cryptography desires re-coding of the whole transmission content. This analysis targets

the characteristic of streaming protocols to record this stream video content and so the knowledge live state of the user whereas additionally analyzing the past system of measurement fluctuations to measure and predict the potential system of measurement changes inside the long run whereas victimization map and cut back formula in cloud computing to instantly transfer the video cryptography to quickly transfer the foremost applicable video format for the user. It performed well, every in power consumption and streaming quality.

II. Previous System

In the previous service, the mobile device side exchanges information with the cloud environment, so as to determine an optimum multimedia video. Scholars have done numerous researches toward conventional platform (CDN) to store different movie formats in a multimedia server, to choose the right video stream according to the current network situation or the hardware calculation capabilities. To solve this problem, many researchers have attempted dynamic encoding to transfer media content, but still cannot offer the best video quality.

III. Disadvantages

1. Video communication over mobile broadband networks today is challenging due to limitations in bandwidth and difficulties in maintaining high reliability, quality, and latency demands imposed by rich multimedia applications.
2. Increasing in network traffic by the use of multimedia content and applications.

IV. Proposed System

The proposed system provided an efficient interactive streaming service for diversified mobile devices and dynamic network environments. When a mobile device requests a multimedia streaming service, it transmits its hardware and network environment parameters to the profile agent in the cloud environment, which records the mobile device codes and determines the required parameters.

V. Advantages:

1. The network bandwidth can be changed dynamically.
2. This method could provide efficient self-adaptive multimedia streaming services.

VI. Related Work

A. User Profile Module

The profile agent is used to receive the mobile hardware environment parameters and create a user profile. The mobile device transmits its hardware specifications in XML-schema format to the profile agent in the cloud server. The XML-schema is metadata, which is mainly semantic and assists in describing the data format of the file. The metadata enables non-owner users to see information about the files, and its structure is extensible.

Fig. 1: User Profile

B. Network and Device Aware Multi-Layer Management (NDAMM):

The NDAMM aims to determine the interactive communication frequency and the SVC multimedia file coding parameters according to the parameters of the mobile device. It hands these over to the STC for transcoding control, so as to reduce the communication bandwidth requirements and meet the mobile device user's demand for multimedia streaming. It consists of a listen module, a parameter profile module, a network estimation module, a device-aware Bayesian prediction module, and adaptive multi-layer selection. The interactive multimedia streaming service must receive the user profile of the mobile device instantly through the listen module. The parameter profile module records the user profile and determines the parameter.

C. Dynamitic Network Estimation Module (DNEM):

The DNEM is mainly based on the measurement-based prediction concept; however, it further develops the Exponentially Weighted Moving Average (EWMA). The EWMA uses the weights of the historical data and the current observed value to calculate gentle and flexible network bandwidth data for the dynamic adjustment of weights. In order to determine the precise network bandwidth value, the EWMA filter estimates the network bandwidth value in which is the estimated bandwidth of the No. t time interval, is the bandwidth of the No. time interval, and is the estimation difference. For different mobile network estimations, this study considered the error correction of estimation and the overall standard difference and estimated the different bandwidths by adjusting the weights among which, is the moving average weight and is the standard deviation weight. When the prediction error is greater than, the system shall reduce the weight modification of the predicted difference; relatively, when the prediction error is less than, 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. The predictor formula for the overall mobile network quality uses the standard normal state value range concept of plus-minus three standard deviations of statistics, referring to identify the stable or unstable state of the current mobile network. If the present mobile network is in a stable state, it shall conform to the following equation among which, is the coefficient of the evaluated standard deviation. The value is almost 1.128. If the network bandwidth value of this time cycle is within plus-minus three standard deviations of the standard value, the present mobile

network will be in a stable state; otherwise it will be in a fluctuating state.

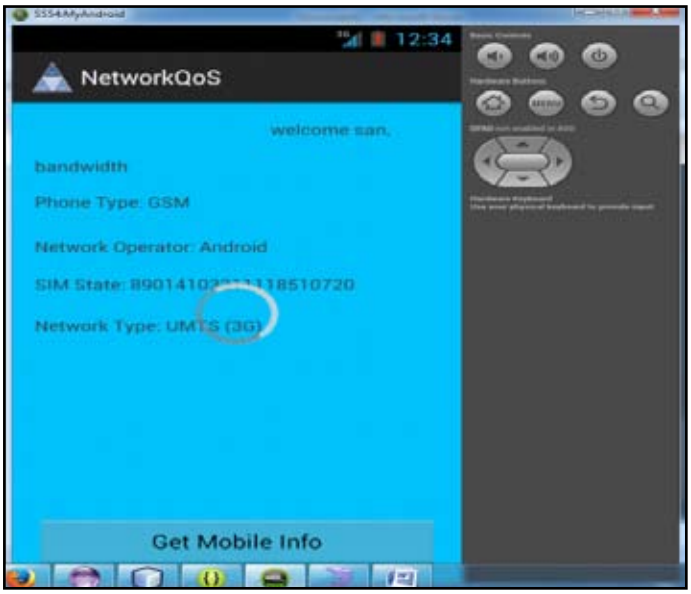

Fig. 2: Collecting the Mobile Configuration

D. Network And Device-Aware Bayesian Prediction Module (NDBPM):

The SVC hierarchical structure provides scalability of the temporal, spatial and quality dimensions. It adjusts along with the FPS, resolution and video variations of a streaming bit rate: however, the question remains of how to choose an appropriate video format according to the available resources of various devices. 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. 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. This assumed condition is also the next main decision rule.

As for the three video parameters of FPS, resolution and bit rate, the bit rate depends on the frame rate and resolution, so the Bayesian network adopts the frame rate and resolution as the video input features and uses the bit rate as parameter considered.

When the predicted bandwidth state and the Bayesian predictive network are determined, the cloud system will further determine the communication and the required multimedia video files according to the information.

1. Communication Decision

A good dynamic communication mechanism can reduce the bandwidth needs and the power consumption of the device resulting from excessive packet transmission, and the transmission frequency can be determined according to the bandwidth and its fluctuation ratio based on such dynamic decision-making. The transmit mode is engaged until the device finds a variation of the transmitted variables that exceeds a threshold. Although the threshold can reduce the communication frequency effectively and precisely, in this mode the mobile device must start up additional threads for continuous monitoring; thus, the load on the device side is increased. When the network bandwidth difference exceeds a triple standard deviation, this indicates the present network is unstable. The overall communication frequency shall incline to frequency to avoid errors; however, when the network bandwidth difference is less than a triple standard deviation, the current network is still in a stable state, and the influence on bandwidth difference can be corrected gradually.

2. SVC Multi-Layer Content Decision:

SVC is an improvement over traditional H.264/MPEG-4 AVC coding, as it has higher coding flexibility. It is characterized by temporal scalability, spatial scalability and SNR scalability, allowing video transmissions to be more adaptable to heterogeneous network bandwidth. This study investigated how to determine an appropriate multimedia video streaming service according to these three major characteristics. First, the appropriate bandwidth interval was determined, in which the average bandwidth was used as the standard value and each standard deviation was the bandwidth interval segment. A quadruple standard difference is assumed to be the boundary value. As the communication and prediction mechanisms are constructed, the system will correct the overall threshold according to the bandwidth variation gradually, in order to avoid the bandwidth boundary exceeding the practical situation. When the bandwidth interval is completed, it becomes the criterion of the video streaming bit rate. The appropriate resolution and frame rate can then be determined as the streaming data. When the mobile device transmits the current network and hardware features to the cloud environment, the NDAMM will predict the bandwidth at the next time point according to the bandwidth and standard deviation and will identify whether the bandwidth state is stable or not. The DBPM infers whether the multimedia video, at different resolutions and frame rates, can complete smooth decoding and whether the hardware can provide complete video playback services, according to the profile examination and subsequent hardware features. When the Bayesian inference table is completed, the next communication time can be determined, and the SVC multimedia coding applicable for the mobile device can be provided according to the predicted and inferred network and hardware features.

VII. Conclusion

For mobile multimedia streaming services, a way to offer acceptable transmission files in line with the network and hardware devices is a stimulating subject. during this study, a collection of accommodative networks and a tool aware QoS approach for interactive mobile streaming was planned. The DNEM and DBPM were used for the prediction of network and hardware features, and therefore the communication frequency and SVC transmission streaming files most fitted for the device atmosphere were determined in line with these 2 modules. within the experiment, the model design was complete associated an experimental analysis was disbursed. The experimental data proved that the strategy could maintain a precise level of multimedia service quality for dynamic network environments and ensure smooth and complete multimedia streaming services. Cloud services might accelerate

analysis on SVC writing within the future. this study presented a network and device-aware Quality of Service (QoS) approach that gives multimedia data suitable for a terminal unit environment via interactive mobile streaming services, any considering the network atmosphere and adjusting the interactive transmission frequency and therefore the dynamic transmission trans writing, to avoid the waste of bandwidth and terminal power. Finally, this study complete a model of this design to validate the feasibleness of the planned technique.

VIII. Future Work

In this work, we've an inclination to easily rely on one flow state of affairs and ignore the interference from the alternative flows additionally as a result of the competitive bidding for spectrum usage from the alternative flows. throughout a CRN with multi flows, the number twenty four offer nodes got to develop refined bidding ways in which considering the competition from the peer flows, and additionally the SSP ought to together think about the cross-layer factors and additionally the bidding values to envision the sharing of the harvested spectrum.

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