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MARKOV DECISION PROCESS IN ONLINE VIDEO TRANSCODE SYSTEM

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Abstract

The video streaming process is content sending the compress form over the internet and displayed by the viewer. Real time video is typically sent from past recorded video documents, yet can be conveyed as a component of a live transmission video. In a live transmission, the video coding is the method involved with packing and de-pressurizing a computerized video signal, sending similar record to numerous clients simultaneously. The Scalable video coding (SVC) utilized for video pressure standard for video encoding. In this paper the video real time measure is detailed as a Markov Decision Process (MDP). To tackle the MDP progressively, we fostered a SVC calculation to take care of the buffering issue utilizing another method that further developed the SVC encoder and decoder calculation, we carried out a testing utilized the Android cell phone and the Scalable Video Coding (SVC) codec.

Keywords—Cloud computing, Markov Decision Process (MDP), Scalable Video Coding (SVC), Android mobile phone.

I. INTRODUCTION

Scalable video coding (SVC) is one way to deal with the empower adaptable video transmission with changing throughput [1], [2]. A SVC video encoder produces a layer video real time that contains a base layer and a few upgrade layers. Versatile implies that it is conceivable concentrate a subset of packed video information which can be utilized to playback the video at a lower quality. The benefit with the utilization of versatile video coding is that the information gets coded as a significant base layer, adequate to make a bad quality portrayal, and at least one upgrade layers, every one of which refine the video quality. Reasonably, SVC gives a way to setting up the information rate for remote video transmission. The remote transmitter can adjust the information rate by specifically booking video information related with different layers for transmission instead of transcoding the video arrangement into an alternate rate.

Scalable video coding has been a functioning examination and normalization region for the somewhere around 20 years. SVC is an augmentation of H.264/AVC standard and adds versatility provisions to it. A versatile video encoder and decoder compacted a video grouping into various clients. Versatile video implies that it is feasible to remove a subset of compacted video information which can be utilized to playback the video at a lower quality.

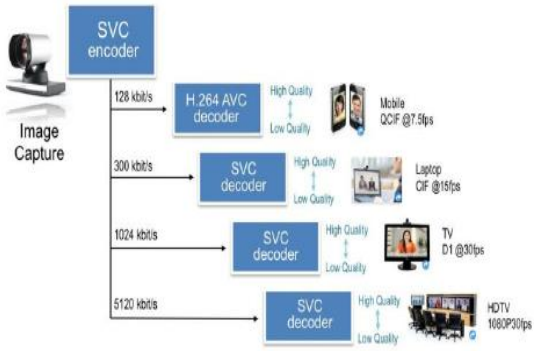

Fig 1: Scalable Video coding

The video streaming over multiple wireless accessed 3G and 4G networks technologies.

3G network

3G network is the wireless technology; it' s related to high-speed transmission, multimedia access, and global roaming. It is mostly used with mobile phones to connect the internet or other IP networks in system to the make voice and video calls, to download and upload the data' s, and to waves on the web with minimum persistent internet speeds on 144Kbps, 3G network is a first mobile broadband.

Fig 2: 3G network

4G network

4G network also known as 4G LTE (long term evolution), it is mostly used for download speeds are 10 times faster than a 3G connection, and with speeds are 10 megabits per second. 4G network is a true mobile broadband, the designed primarily for data.

The benefits of 4G network into three categories:

- The improved download and upload speeds
- It reduced for latency
- Crystal clear voice and video calls

Fig 3: 4G network

Table 1: 3G/4G Networks

Technology	**3G**	**4G**
Data Transfer rate	3.1MB/sec	100 MB/sec
Internet Services	Broadband	Ultra Broadband
Mobile TV Resolution	Low	High
Bandwidth	5-20 MHZ	100+MHZ
Frequency	1.6-2 GHZ	2-8 GHZ
Network Architecture	Wide Area Network	Hybrid Network
Signal Quality	Good	Best
Communication Type	Circuit Switching	Packet Switching

In this paper, we formulate the multi-link video streaming process as a strengthen learning task. First, we formulate the video streaming process over multiple links as an MDP problem.

We developed SVC algorithm to solve the buffering problem using a new technique that improved the SVC encoder and decoder algorithm, we implemented a testing used the Android mobile phone and the Scalable Video Coding (SVC) codec. Experiment results show that the proposed encoder and decoder algorithm is feasible for video streaming over multiple wireless access 3G and 4G networks technologies.

II. LITERATURE REVIEW

Outline of the Scalable Video Coding Extension of the H.264/AVC Standard[3], Its Method utilizing for Video Coding Experts Group (VCEG) and Moving Picture Experts Group (MPEG),Junfei Huang and Zhaowen Lin[4] further developed this techniques Device-to gadget interchanges Data Rate Splitting Assignment calculation, Pei fan, Ji wang, Zibin zheng, Michael R Lyu [5] we fostered a the calculations of bunch investigation and Ranking strategies. Consistent Supports the Low Latency of Mobile Applications with NFV-Enabled Mobile Edge-Cloud[6],methods utilizing for Capacity Violation Detection (CVD), Online Adaptive Greedy (OAG) Algorithms, created by Binxu Yang, Wei Koong Chai and George Pavlou, the creators discover the SVC utilizing java netbeans, they guarantee 4G organizations.

III. RELATED WORK

We developed an SVC algorithm to solve the buffering problem using a new technique that improved the SVC encoder and decoder algorithm. Video streaming is fairly bandwidth intensive live broadcast over the cellular network with 3G live streaming or 4G live streaming techniques with good compression and good signal strength[8]. Establishing RFCOMM channels/sockets.

SVC Encoder Algorithm

```
Algorithm SVCencoder (int video size)
{
If (encoder >= 128 Kbits && encode < 300 Kbits)
{
decoder (H.264 AVC);
}
else
{
decoder (SVC decoder);
}
If (encoder >=1024 Kbits && encoder <= 5120 Kbits)
{
decoder (SVC decoder);
}
  Print " Image from high quality to low quality"
}
```

SVC Decoder Algorithm

```
Algorithm decoder (int video size)
{
If (decode == H.264 AVC)
{
decode ( range 128 Kbits) }
else if( decode=SVC decoder)
{
decode (300 Kbits);
decode (1024 Kbits);
decode(5120 Kbits);
}
```

Performance Analysis

Performance analysis of proposed method is more efficient Encoder/ Decoder based on transcode, Afterward we tend to measure transcode and information elements in additional detail, and eventually performance of cost results.

Experimental Results

In this arrangement of analyses, to utilize the workers on cloud in four occasion families: broadly useful (m), figure streamlined (c), memory-improved (r) and plate advanced (I) and estimated the throughputs. Absolutely use multi-center CPUs available at the workers, the empower multi-client on information and transcoding parts. Explicitly an inclination to starting run the investigations abuse one string (T=1), so increment the measure of strings T by one to run the experiment again.

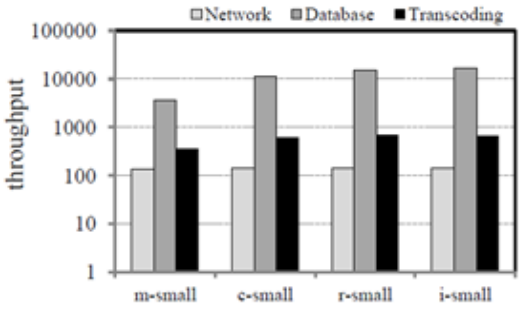

Fig 4: Single user

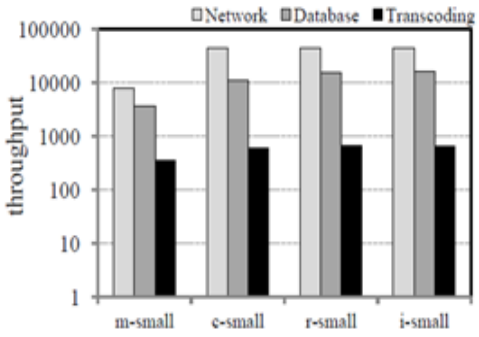

Fig 5: Multiple user

Video transcoding is the process of compressing a digital video signals on laptop to mobile devices. Video streaming process is high quality to low quality the transcode process on 3G network and 4G network technologies used for single user and multi user (more than one user).

The purpose wherever outturn cannot be improved more is that the most outturn that the server can do. Note that there's no index engineered on the data table within the info and that we profit of bulk insert, where 1,000 rows are written into disk together dealing that decreases the disk I/O considerably. For transcoding responsibilities, we have a tendency to scale back the video resolution from 640x360 to 1280x720.

To additionally detect that the consequences area unit similar for various output formats:

Proposed schemes required the video buffer on encoder and decoder used for video compressed (128,300,1024and 5120 Kbits). Video transcode process on HDTV, TV, Laptop and mobile phones.

Table 2: Resolution bit rates

	Resolution	Avg.bit-rate (kbps)	Std.bit-rate deviation
S1	320*180	112.84	39.01
	320*180	238.94	88.84
	640*360	363.82	140.33
M2	640*360	235.4	92.09
	1280*720	531.1	215.97
	1280*720	1,056.9	469.1

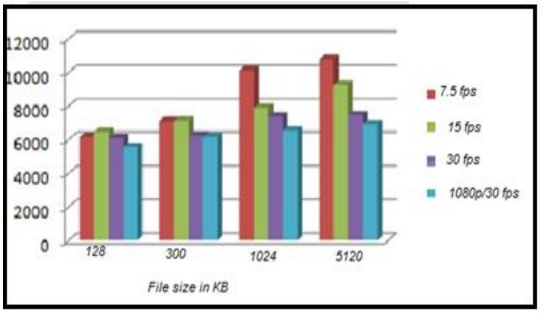

Fig 6: Encoder/Decoder Execution time (ms) for different Kbits

Table3: Encoder / Decoder CPU time of different Frames per second (7.5, 15, 30 and 1080p/30)

File size in KB	7.5 frames per second	15 frames per second	30 frames per second	1080p/30 frames per second
128	6	6	6	6
300	9	8	7	6
1024	13	9	8	7
5120	17	14	10	9

Video streaming process on waves length in encoder and decoder compressed different frames per second (7.5fps, 15 fps, 30 fps, 1080p/30 fps). The transcode on video process high quality to low quality file size in Kbits.

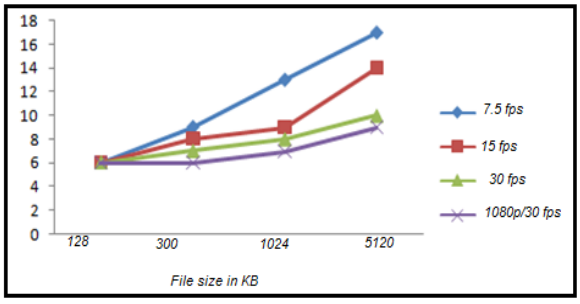

Fig 7: Video streaming process on SVC Encoder/Decoder Execution time (ms)

These result video transcode on different file size in various format.

The high edge rates, the length of video that organization will deal with diminishes since the components of the recordings develop and soak was fixing data measure capacity. The transcoder will strategy a more limited amount of video each second as FPS will increment since its outturn on a chose worker is quick. These different frames per second will change on transcode different devices (HDTV, TV, Laptop and Mobile phones), the transcoding 3G network and 4G networks on wireless technologies.

IV. CONCLUSION AND FUTURE ENHANCEMENT

In this research paper, to design one casing based metric which may experience the presentation of 3 principle framework parts on cloud programming for a huge scope versatile video application, especially for transferring recordings from PC to cell phones. The isolated video client to move as headway into three stages and known the framework assets utilized at each stage. After, we plan many approaches to boost mainframe output and all over that running single and multiple user to transcoding processes will increase output linearly with the amount of CPUs.

Our experimental results show that single and multiple user gives the video compression most effective presentation for a source concentrated mobile video application. In future, the different server aspect on processes, which will also have many applications.

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