Cloud Based Comparison between Progressive Download and DASH: Mobile Streaming Performance Evaluation

T. Mahesh Kumar, UBA Ravi kiran, V. Pruthvi Chaithanya Varshu, M. Bharat, G. Gurupadam & Kudakwashe Zvarevashe

M. Tech, Department of Computer Science and Engineering

Jawaharlal Nehru Technological University Hyderabad

Corresponding Author Email: tmk528@gmail.com

Abstract—

Now a day's moreover Video data can be getting through internet only. day by day it accounts for internet traffic. Today the use of mobile devices with high resolution which increase the sharing of video content through social Networks. The growing features of mobile devices will facilitate this type of development. the available bandwidth for different mobile phones will vary according to the network situation. The bitrate should be differed for different mobile phones, The internet congestion fluctuations says that the bandwidth available to each mobile client will vary depends upon the network condition. Basically the internet video was downloading based on the progressive HTTP download, but this method is unable to adapt the bandwidth changes, for that reason we propose a Cloud based Dynamic Adaptive mobile Streaming over HTTP method to increase the performance of the video quality to avoid the server scalability issues. Now the experimental analysis shows that in mobile phones through cloud services we will get the better quality video service.

Keywords:-

Adaptive Mobile Streaming, Cloud Service, Video Quality, HTTP Streaming.

Introduction

Cloud computing is the emerging technology with growing internet services. Nowadays Cloud services can be utilized by using smart phones and smart books. Cloud computing is the delivery of computing as a service rather than a product. Cloud computing is used for sharing resources to achieve coherence and economies of scale, similar to a over a network [1]. The cloud also focuses on maximizing the effectiveness of the shared resources. Cloud services are usually not only shared by multiple users but are useful for dynamically reallocated per demand. This is used for allocating resources to users. There are mainly three types of clouds those are: Private Cloud, Public Cloud, Hybrid Cloud [4]. Private cloud is cloud infrastructure operated solely for a single organization and it was managed internally by a third-party, and it will be hosted either internally or externally. And various services provided by cloud are IAAS, PASS, SAAS.

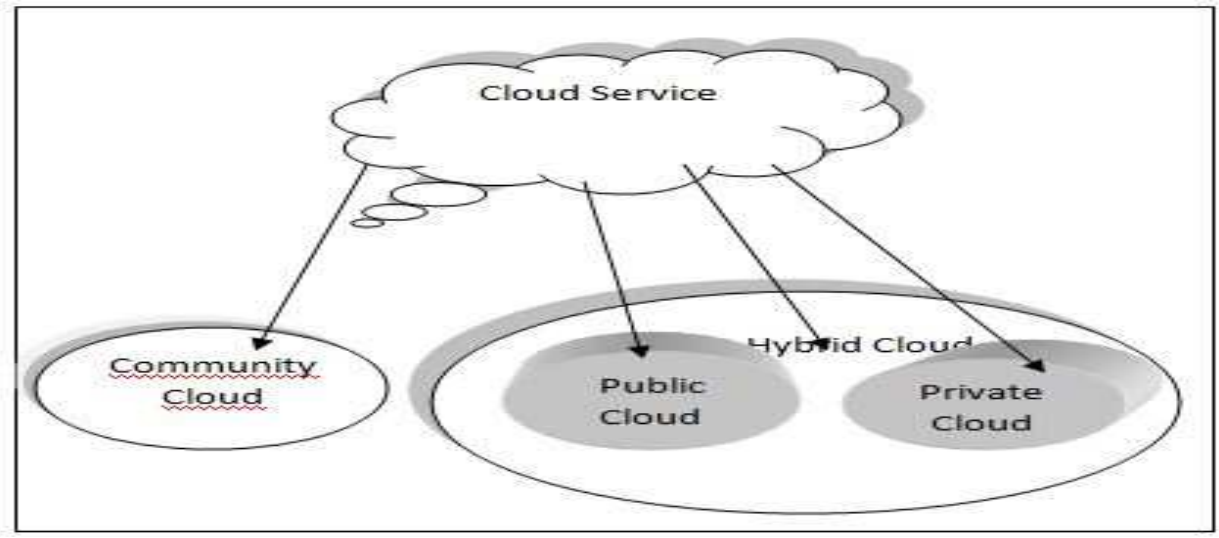

Fig 1. Types of Cloud Service

2. Streaming Service

Streaming media is multimedia that is constantly received by and presented to an end-user while being delivered by a provider stream refers to the process of delivering media in this manner; the term refers to the delivery method of the medium rather than the medium itself [5]. Types of streaming media are Live Streaming, Video Streaming Live Streaming refers to content delivered live, and it requires a camera for the media, an encoder is used to digitize the content. media publisher and content delivery network are used to distribute and deliver the content.

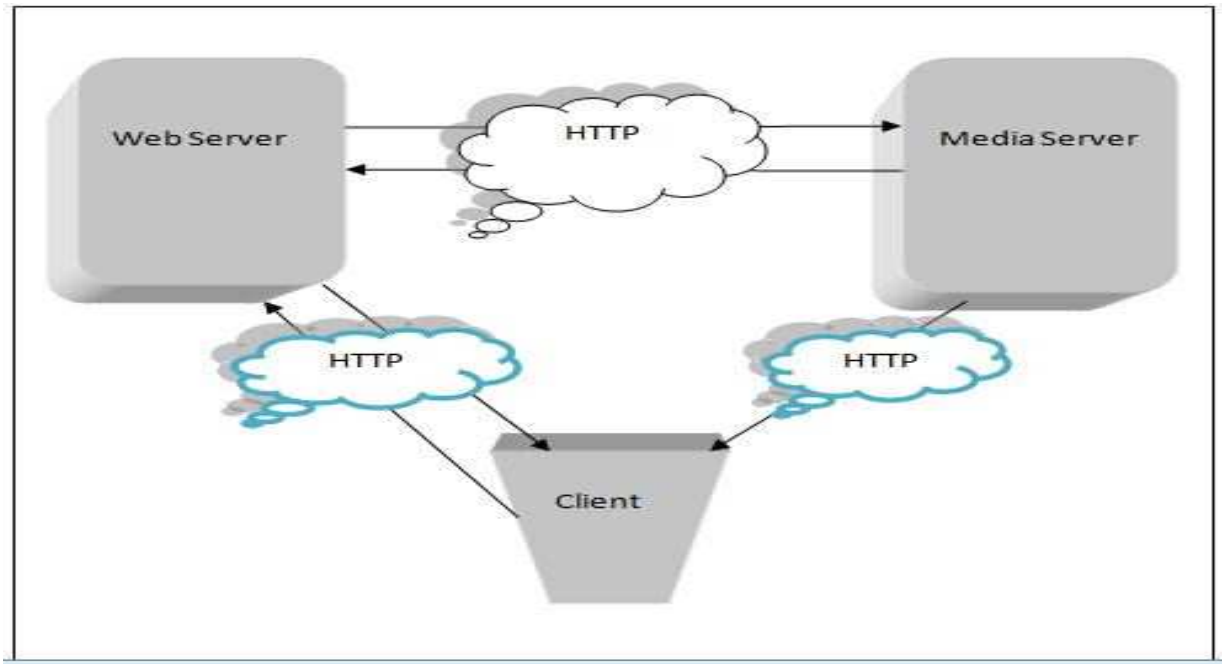

Fig 2. Server to Client Streaming Service

Existing System

1. Progressive download Mode:

In the progressive download mode the client can request the video file then the server responds with protocols like HTTP, RTSP. With these protocols the basic part of the file will be downloaded this type of download is called the Progressive download, this type of progressive download method was used in many websites, the simle example of this method was used in YouTube, while downloading the video file the client can present the video data on the player[2][3]. From this we conclude that with progressive download mode does not need to download the overall video file after the client can send the request to the server only the whole video file will be downloaded. So in this process waste of bandwidth will occur. These HTTP and RTSP Mechanisms are based on the transmission of a given file. Here in this mechanism client can select the different video qualities of the same file according to variation of the mobile devices, because different devices have different resolutions, obviously it is a static selection for transmission. It requires different encoding qualities and bitrates for video streaming. And this causes the network load fluctuations.

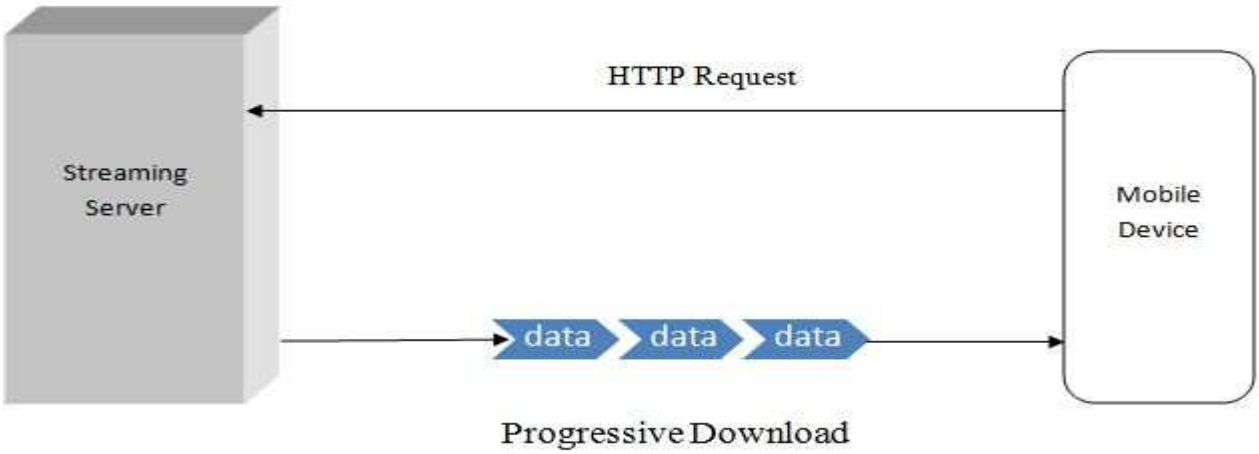

Fig 3. Progressive Download Mode

2. Dynamic Adaptive Streaming Over HTTP:

It is one of the Hybrid method used for Video Streaming it requires two methods those are Traditional Streaming and Progressive Download it uses the HTTP Protocol But does not perform the overall video streaming whenever the client request for a video file[4][5], the video file is divided into small Chunks of video clips and these can be accessed by the client one by one. The complete file composed of different segments. If we take an example of Mp4 encoder for one file Different file formats are developed by using this concept. Usually when a mobile device requests for

the video file in the form xml schema format it gets download the video file not full first the basic part is downloaded and played first and after while downloading the file another layers are also accessed according to the mobile device parameters.

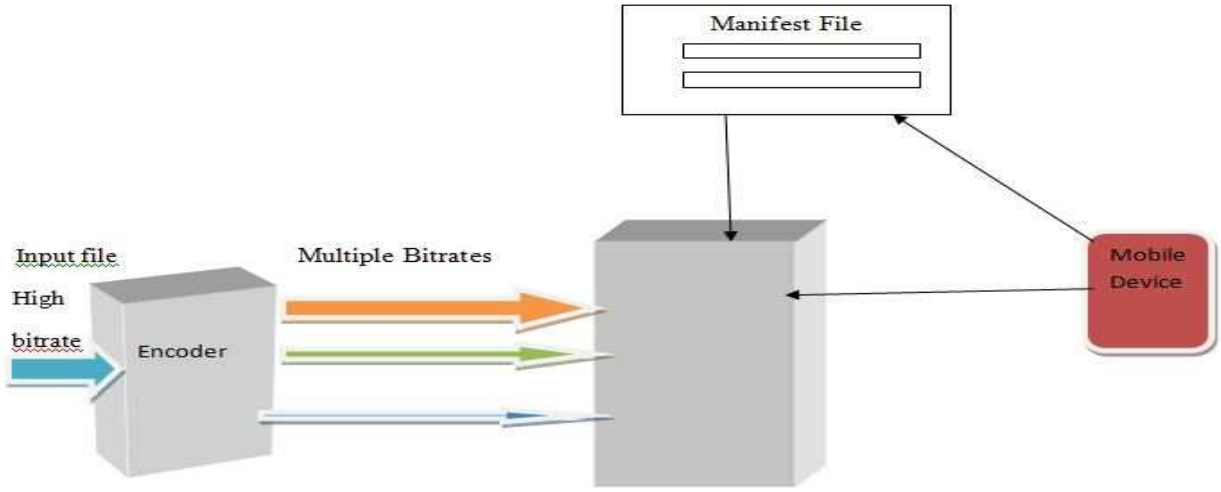

Fig 4. Dynamic adaptive Streaming

III. Proposed Work

Performance Evaluation:

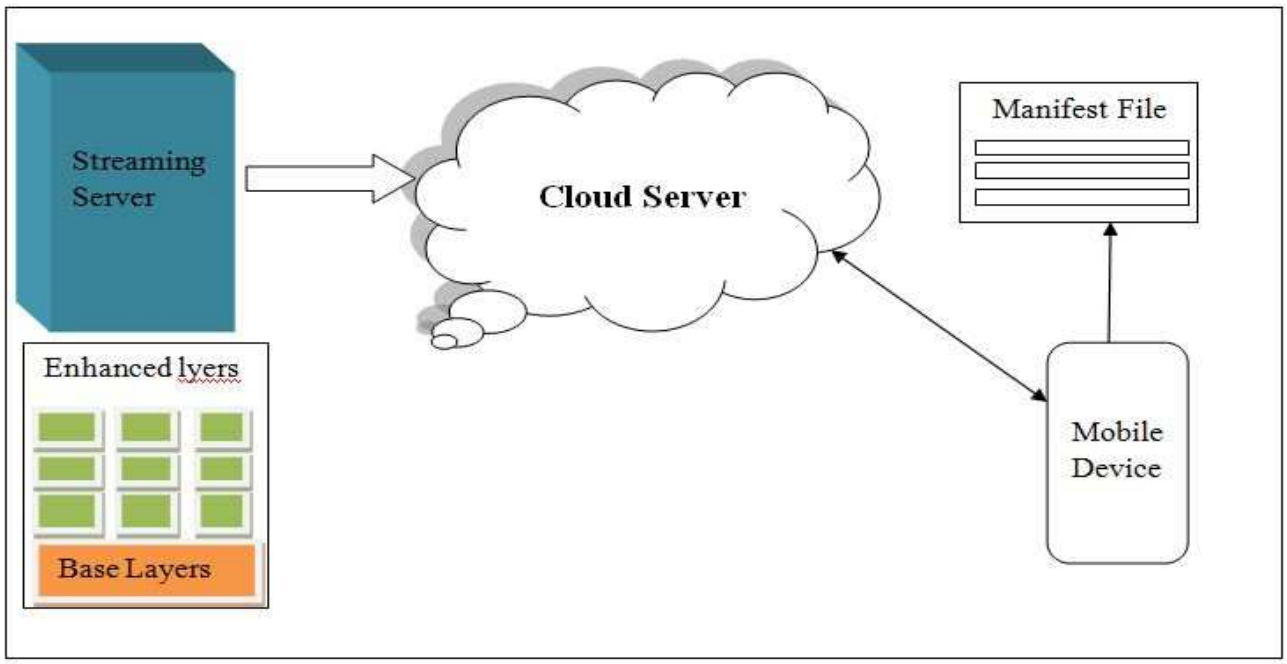

Fig 5. Cloud Based Mobile Streaming

In this Cloud based mobile Streaming Whenever the mobile Device request a video file first the base layer of the video file was accessed and after the enhancement layers are also accessed while streaming. in architecture we seen that the mobile device sends the mobile parameters in the form Manifest file according to that bandwidth the video file was accessed this is in the form dynamic adaptive streaming in this method there is no wastage of bandwidth occurs, while streaming. When compare to progressive download method efficient Cloud based Adaptive streaming better to perform the operation in this case we consider evaluation process to conclude the experimental results. Taking different video formats for comparison. We use three video formats for comparison. Here we are taking three videos like A,B,C. and for these three video we are taking 3 quality levels, those are Low, Medium, High.

Table 1. Mean Bit rate of the Video Streams

Mean Bit Rate			
Video	Low Quality	Medium Quality	High Quality
A	120kbps	240kbps	512kbps
B	120kbps	240kbps	512kbps
C	120kbps	240kbps	512kbps

Table 2. Peak Bit rate of the Video Streams

Peak Bit Rate			
Video	Low Quality	Medium Quality	High Quality
A	2000kbps	2500kbps	4500kbps
B	1200kbps	1200kbps	2400kbps
C	1500kbps	1500kbps	3000kbps

From the Experimental analysis we can say that the initial buffering delay with progressive download is problematic for the low bandwidth conditions. If it is high resolution will be selected then than the benefit of dynamic adaption is minor in the form streams being interrupted due to buffer underflow. And this result will also tell us to choose weather DASH or progressive download. User is always looking for good quality with less buffering delays. So there is no wasted bandwidth in dynamic adapting.

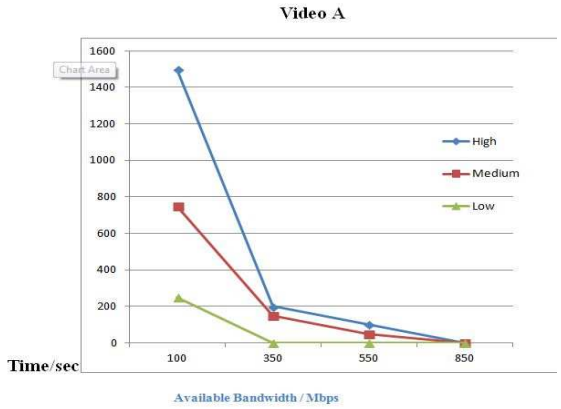

Fig 6. Three Quality levels of Video data to be transmitted to the clients Buffer for Video A

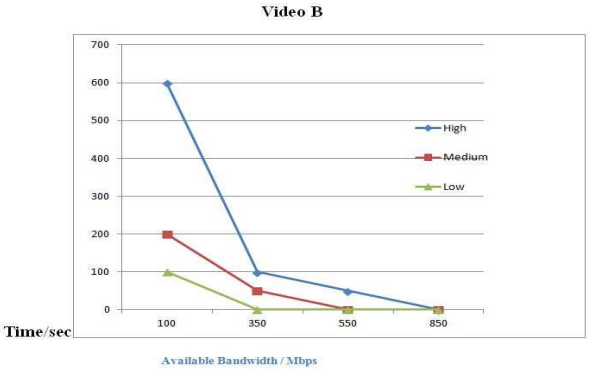

Fig 7.Three Quality Levels of Video data to be transmitted to the clients Buffer for Video B

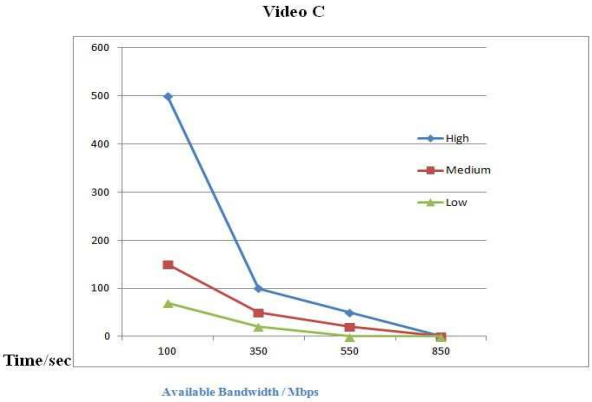

Fig 8. Three Quality Levels of Video data to be transmitted to the clients Buffer for Video B

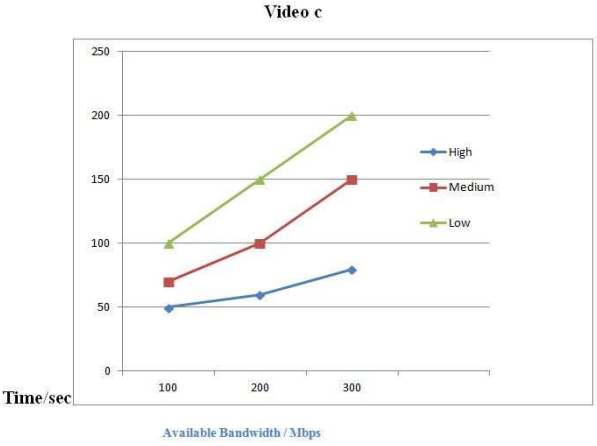

Fig 10. Three Quality levels of video B Time for Buffer Underflow

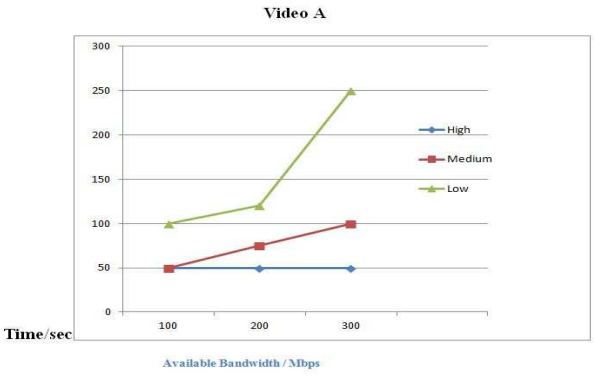

Fig 9. Three Quality levels of video A Time for Buffer Underflow

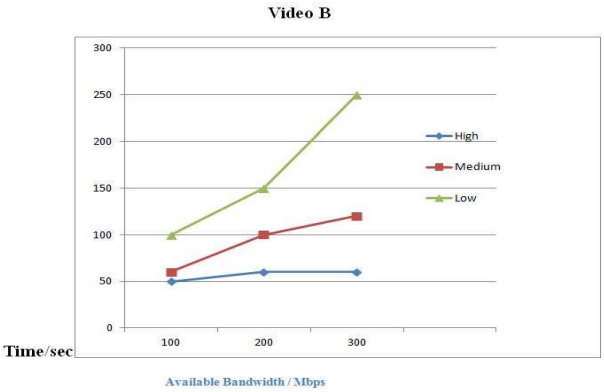

Fig 11. Three Quality levels of video C Time for Buffer Underflow

We seen that by using these *observations* we can conclude that initial aggressive buffering says that buffer underflow is avoided these three video can be measure by sending the mobile environment parameters to the Cloud server then we will get the fast streaming process in the process adaptive mobile streaming.

IV. Conclusion:

Comparing the both progressive download and Adaptive Streaming we conclude that adaptive streaming is very popular in these days. So here in this system we proposed Cloud based Adaptive streaming over HTTP performs better quality video levels and finally will give the maximum beneficial results in this overall processes

Future Work:

In the future there is need of increased performance in SVC transcoding and in this process compare to accurate mechanisms for bandwidth estimations and Quality of service under various bandwidths will be needed.

References:

1. "The NIST Definition of Cloud Computing". National Institute of Standards and Technology. Retrieved 24 July 2011.
2. VK Adhikari, S Jain, Y Chen and ZL Zhang, “Vivisecting YouTube: An Active Measurement Study” Proceedings of INFOCOM 2012.
3. J Summers, T Brecht, D Eager and B Wong, “To Chunk or not to Chunk: Implications for HTTP Streaming Video Server Performance”, Proceedings of NOSSDAV’12, 2012.
4. T Stockhammer, “Dynamic Adaptive Streaming over HTTP – Standards and Design Principles,” ACM Multimedia Systems, , pp 133-143, Feb. 2011.
5. Fitzek F.H.P. and Reisslein M , “MPEG-4 and H.263 Video Traces for Network Performance Evaluation.” IEEE Network, Dec. *2001, **15**(6). Pp 40-54, 2001.*
6. Cloud and Computing Technology” http://cloudandcompute.com/private cloud/privatecloudmor”Security”.Secure/CloudAndCompute.com..http://www.informationweek.com/private-clouds-take-shape.
7. Patel, Mili, and Proff. Anupam R. Chaube. "Literature review of recent research on Cloud Computing in Education." *International Journal of Research* 1.6 (2014): 887-897.