

## Balancing power in Smartphone video streaming

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*Abstract - Streaming the video on cell phone turns into a most well known procedure and this procedure can expend a cell phone battery fastly. The vast majority of the vitality is devours by the remote system. Gushing the video is asset starving procedure, while cell phones are asset stifled gadgets when contrasted with the desktop machines. There are diverse parameters which affects on the assets, for example, video quality, transmission capacity and so on. There are some pointless substance which expands the activity overhead. Here, given that how these assets influence on the battery life. Here utilizations an android working framework to make a downloader and utilizing this downloader attempting to demonstrate the vitality wastage by various video quality, transfer speed, cpu and so on. Yield of the framework is asset usage. Framework likewise utilizes sifting to move the downloading content which are pointless that client wouldn't like to watch.*

**Keywords:** - Mobile communication, Radio Resource Control, Power consumption, Video streaming.

### I. INTRODUCTION

Presently a day's advanced mobile phones are constant contraption. Adaptability having an abundance of employments to use which make it application constrained to it. Most ordinary issue for moveable using is battery use. Exhibition and clamor having a noteworthy space in adaptable organizations in where video spilling used by every age pack for various purposes[1]. Advanced cells are generally utilizing video gushing application for better comfort. In remote contraptions video spilling devours more battery and reasons the issue of battery life. Remote framework having a noteworthy base, and as an aftereffect of some fundamental data downloading it furthermore grows the movement overhead[1][3].

We see that imperativeness of phones are waste in taking after ways, 1) unmoving essentialness spending in perspective of Radio Resource Management which keeps the radio controlled on for a time period after all bytes of a trade have been gotten 2) imperativeness spent in downloading Unnecessary substance that the customer might not want to watch 3) essentialness spent in downloading content that the customer won't look as a consequence of forsaking the session [1].

The continued with improvement of video substance makes challenges for framework organization suppliers in ensuring a predictable sight and sound contribution with first class levels to the end-client[2]. Driven by the creating pervasiveness of destinations and applications including video-sharing (e.g., YouTube, Vimeo, et cetera.), casual associations (e.g. Facebook, Twitter, et cetera.), video-conferencing, et

cetera, video based applications have seen the most astonishing improvement rate of any application class. Video substance is depended upon to speak to 66% of overall flexible data development by 2015[10].

As of late, insightful adaptable handling devices have ended up being logically direct and extraordinary, provoking an important improvement in both the amount of bleeding edge versatile customers and their information exchange limit requests[11]. Compelling the measure of pointlessly downloaded data is fundamental for some adaptable framework customers who have a standard in their data course of action. It is pretty much as key for video organization suppliers who need to in like manner pay for their information transmission.

This paper is organized as follows. In Section II, we give a related work doing for balancing energy and control traffic overhead using video viewer retention. In Section III and IV, we discuss about balance energy and traffic overhead. In section V, we present our system architecture. In section VI, we showcase the android prototype, after that we conclude the system.

### II. RELATED WORK

Finding an imperative tradeoff in imperativeness waste between prefetching little and broad squares of video substance: little pieces are terrible in light of the fact that each download causes a created tail essentialness to be spent paying little review to the measure of substance downloaded, however considerable pieces manufacture the threat of downloading data that customer will never find in light of leaving amidst the video [1].

Video spilling is a champion amongst the most used compact organizations. Projections about its advancement within the near future dependably prescribe kind improvement [2]. A less forceful buffering framework could be used to restrict the measure of pointless movement traded to customer's devices however never played back due to right on time leaving by the customers. For phones, other than the prefetching apportionment plot that is useful to quicken the video playback, a more correct control of the buffering is essential to avoid duplicate transmission of data [3].

In as of late spilling media organizations, including tradition rollover, Fast Streaming, MBR, and rate alteration with these systems current spouting organizations inclination to over-utilize the CPU and transmission limit resources for give better organizations to end customers, which may not be a pined for and feasible way to deal with upgrade the way of spouting media transportation. A coordination instrument that joins the advantages of both Fast Streaming and rate conformity systems is proposed to effectively utilize the server and Internet resources for building a brilliant spouting organization [4].

Recently accessible cell phone models slice down the vitality cost by actualizing a component called Fast Dormancy (FD), which weights the radio to go to a low vitality state taking into account a short latency clock [7]. On the other hand, such sit out of gear clock based methodology face two downsides: a few applications have a vast changes in their parcel between landing appropriation and second change in system conditions because of portability can likewise change the bundle between entry dispersion. Interestingly a proposed framework Radio Jockey examines program execution follows and digs rules for recognizing end of correspondence spurts [8].

The Based on the estimations with the most recent cell phones recognized that there are five diverse spilling strategies. The utilized system relies on upon the administration, customer gadget or versatile stage, player sort, and video quality. The vast majority of the strategies are productive in enduring prefetching so as to fleet and long haul data transmission vacillations content. Since an interfered with video session can bring about noteworthy information and vitality waste, ON-OFF-M gives a harmony between characteristics of experience, and information or vitality waste [10].

Five assorted quality levels of the sight and sound stream were considered and their impact on the imperativeness usage was moreover inspected. The results show that by changing the quality level of the intelligent media stream the imperativeness can be unfathomably saved while the customer saw quality level is still tasteful. This demonstrates the focal points that can be got by using a flexible intuitive media segment as a piece of terms of imperativeness use. These parts could be further improved in order to consider the imperativeness use, making them essentially more essentialness proficient [11].

### III. VIDEO STREAMING ON MOBILE

#### A. Power consumption Modes

Each remote base sort out some structure which guarantees that the radios are not full time controlled ON, for that reason they keep up some working modes.eg. wi-fi with force sparing mode, transmit mode, unmoving mode, rest mode. In 3G and LTE these modes are worked by the Radio Resource Control (RRC) Protocol. In 3G system these modes are identified with various transport channel distribution i.e. CELL\_DCH (committed channel), CELL\_FACH (Forward access channel), CELL\_PCH (paging channel). In LTE Network modes are either associated or sit without moving.

Power utilization modes are taken care of by the Radio asset administration (RRC). [5][6]In the Figure 1 IDLE mode is most minimal force utilization mode we can say that rest mode and CELL\_DCH is a Highest force utilization mode. From higher to lower force it will associate bidirectional to switch in the middle of various modes.

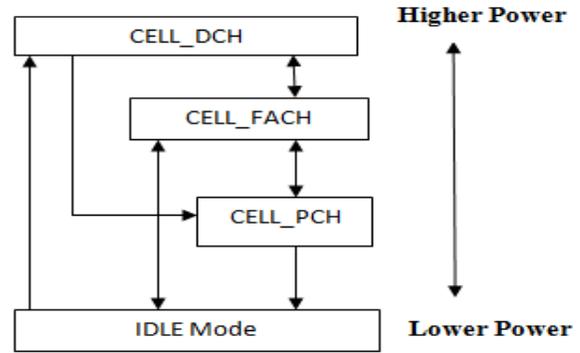


Fig1. Switching power states between Idle mode to CELL\_DCH i.e. lower power mode to Higher Power Mode

#### B. Mobile multimedia services

In video spilling there are assorted sorts of spouting using http over tcp.1) Fast start, in which server sends the substance using all the available bandwidth.2) Encoding rate, in which client gets the substance at the encoding rate.3) Throttling, in which server sends the substance snappier than the open spilling rate which throttles the content.4)ON/OFF-S, in which it creates the returns with TCP affiliation, server uses the zwp and client utilizes the zwa reports to the scrutinizing data. 5) ON/OFF-M, in which client makes the new TCP relationship to begin with of each ON period

DailyMotion , apply five spouting strategies to the phones of five particular flexible stages. There is no deliberate system for picking a method among a spouting session. In an expansive segment of the devices, the systems can move in light of organization, nature of the video, the video player.

The choice of a remote interface does not affect the decision of a technique. There are two strategies associated by the spilling servers.1) Fast Caching and 2) Throttling. The two affirmation smooth playback.

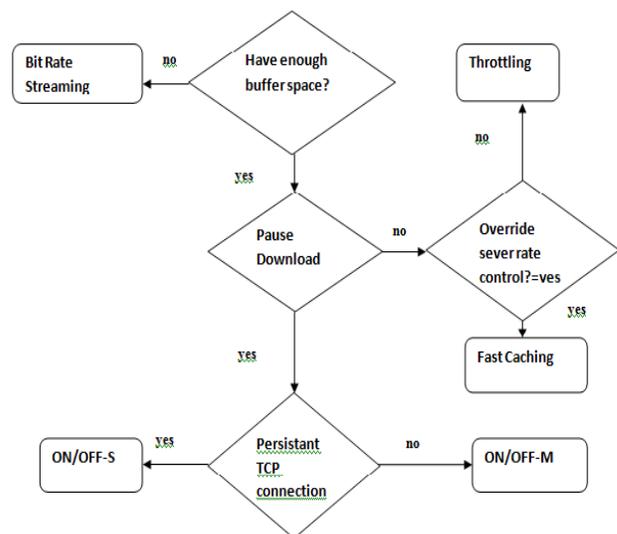


Fig 2. Media Streaming HTTP over TCP

### C. Network Scenarios

There are Different scenarios we have to consider when thinking about the energy wastage in video streaming.

scenarios 1 – The instance of a portable client, situated close to the AP (access point), with no foundation movement in the system.

scenarios 2 - the portable client is situated in a poor range. with no foundation movement in the system so as to the effect of the connection quality on the vitality utilization of the cell phone.

scenarios 3 - like the initially, aside from that foundation movement was included request to stack the system, and study the effect of the system load on the vitality utilization of the cell phone.

scenarios 4 – like scenarios 2 with the exception of that foundation activity was included as in situation 3, keeping in mind the end goal to the effect of both poor connection quality and system load, on the vitality utilization of the cell phone

### D. Video quality

There are differing levels of the video quality. The video is transcoded at five unmistakable quality levels, proposals for encoding video for multi bit rate adaptable spouting. The encoding characteristics of the five test plans are presented in Table. H.264/Mpeg-4 AVC video weight is use with the mp4 outline. The most vital determination is picked as 800x448 pixels to fit the screen determination of the Android device (800x480 pixels), while keeping up the primary edge extent of the video.

TABLE I. QUALITY LEVELS AND THEIR SCREEN RESOLUTION

Quality Level	Video Codec	Overall Bitrate [Kbps]	Resolution [pixels]
QL1	H.264/	1920	800x448
QL2	MPEG-4	960	512x288
QL3	AVC	480	320x176
QL4	Baseline	240	320x176
QL5	Profile	120	320x176

## IV. PROPOSED WORK

### A. System Architecture

Framework proposes the construction modeling in which it acknowledges the distinctive URL from the clients. This URL is the name of whatever client needs to scan for. Utilizing this URL framework will gives the rundown of media, client need to choose one in that rundown.

Video will playback after the picking one, when it will stop or delay framework will give the data about the vitality waste. On the off chance that client needs to know how to expend less vitality they need to choose the kind of system, video quality transmission capacity and so forth. There are a few situations

where vitality is waste in superfluous substance downloading like commercials. We can spare this vitality utilizing sifting the advertisements which are waste the vitality for downloading pointless information.

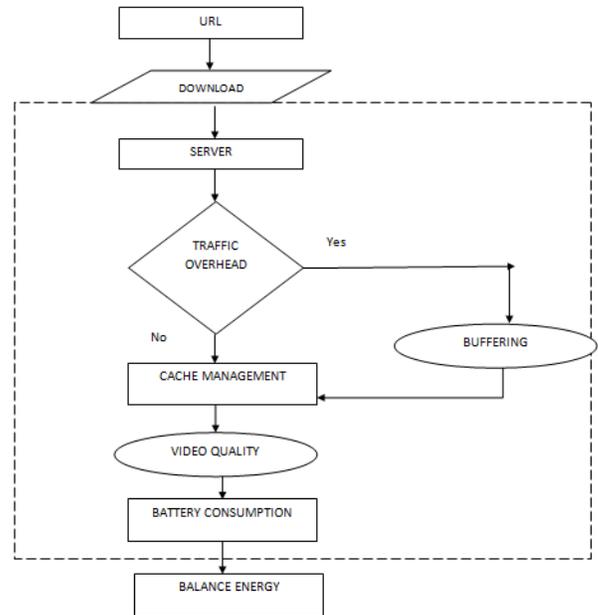


Fig 3. System architecture

### B. Algorithm

**Input :** URL, Quality, Network type.

**Output :** Details of energy wastage.

1. Begin
2. Enter the URL
3. Video streaming is started...
4. If video == STOP or PAUSE  
Enter the Video quality, Type of network  
Display's the energy balancing or not and details of the energy wastage.
5. Start the video again...
6. Stop

## V. EXPECTED RESULTS

We are building up an android application that coordinates a Youtube downloader and shows the graphical representation of the vitality waste to the client.

A spilling session is starts with the recovering of the genuine downloading URL from the server. The downloader then chooses the URL from the rundown of gave conceivable connections and downloads the substance.

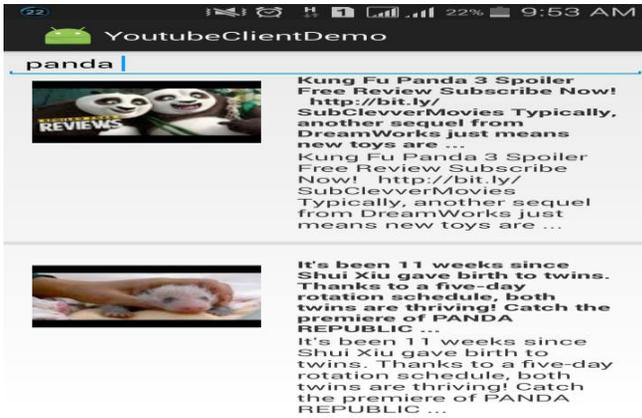


Fig 4 : URL and List of related videos

Playback is start after choosing the single URL. It will shows the options for changes video quality. when video will pause or stop it will display the graphical representation of energy wastage.

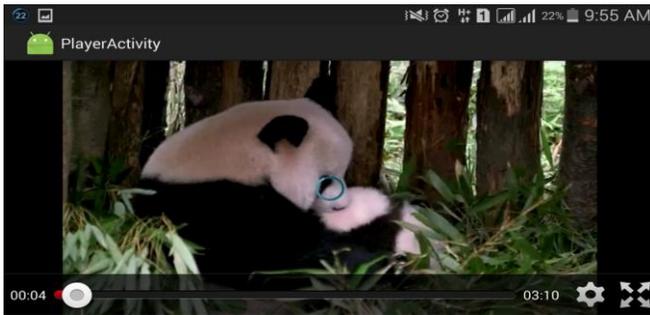


Fig 5. Playback of video

#### A. Impact of video quality on Battery consumption

Video quality is an imperative element in vitality utilization i.e. best quality level video can optimize more battery.

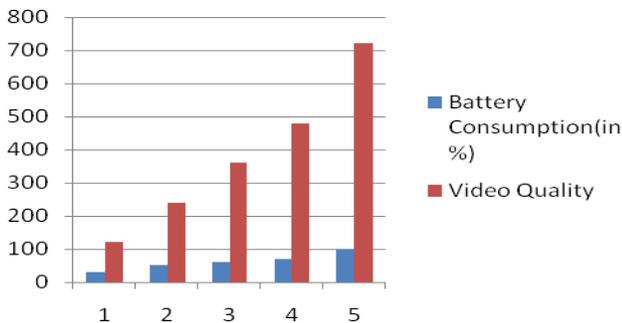


Fig 6. Video Quality

#### Impact of bandwidth on video quality

Bandwidth is measured in mega bits per seconds In the event that transmission capacity expands client will get enhanced quality level.

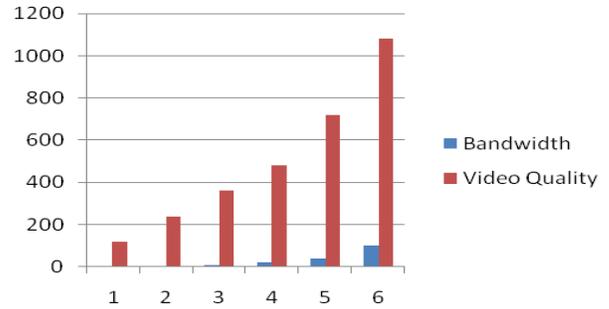


Fig 7. Playback of video

## CONCLUSION

The major proposed of the framework is to create an application that deliver the visual perspective of vitality waste by CPU, versatile information, system to the client. Here, presents diverse video gushing procedures, vitality utilization methods of remote system. Here proposed an android application for the investigation of the video gushing force utilization. This framework is help to the client to know the client about the vitality utilization.

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