International Research Journal of Engineering and Technology (IRJET) e-ISSN: 2395-0056
Volume: 04 Issue: 10 | Oct -2017 www.irjet.net p-ISSN: 2395-0072

Bandwidth Efficient: On-Demand Multimedia Advertisements Using Mobile Agents

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Abstract - *The increasing popularity and availability for the multimedia-on-demand advertisements with a high social quotient is exponentially rising. Recent advances in storage and communication techniques have spurred a strong interest in on-demand multimedia systems. As the use of multimedia-on-demand advertisements increases, the demand for the resources required to support them also increases. Resource allocation should be done in a cost-effective manner. It is observed that such multimedia on-demand advertisements adopt the traditional approach like client-server model. Here we have explored that the traditional approach does not support the productive bandwidth distribution calculation for the on-demand media advertisements. The latency and network traffic increases as the number of requests for on-demand media applications goes on increases that seriously affect the quality of service. In order to overcome the drawbacks of the existing approach, we have proposed a mobile agent paradigm which effectively distributes the productive bandwidth for the high priority on-demand multimedia advertisements. In distributed environment the mobile agents paradigm has been identified as an alternate technology. Here the mobile agents migrates parallel to the registered public websites to retrieve the number of downloads and number of views for the requested on-demand multimedia advertisement and assign high weight for the high priority advertisement. We will classify the advertisements based on the weights assigned into three classes those are popular, medium and average by using classification algorithm. As the user make a request for the advertisement mobile agent check the associated weight for the corresponding on-demand multimedia advertisement and allocates bandwidth by using efficient bandwidth allocation algorithm. Which reduces advertisements rejection ratio also increases productive bandwidth distribution. The proposed work is implemented using ASDK(Aglets Software Development Toolkit)*

Key Words: **Mobile Agents, Aglet, Multimedia Advertisement, On-Demand, Bandwidth, Social Media, Youtube API, Facebook**

1. INTRODUCTION

On-demand multimedia advertisement content with the increasing availability and popularity (e.g., video files, television programs, movies, music, still images, image slideshows, etc.), for the advertisements with a high social quotient is exponentially raising. Traditional methods of associating advertisements with media content may not be effective for the advertisers or economical for the media providers. For example, with traditional broadcast television, ad spots associated with a particular program are sold to advertisers based on predicted ratings for the program.

1.1 On-Demand Advertisements

Current asset distribution techniques can be ordered as either disconnected, or on-line. Disconnected techniques allotment sums before transmission starts. Such strategies allot the assets statically for the length of the application. The focal points are effortlessness and consistency. Be that as it may, the detriments are low asset use if the top to-mean proportion is high and furthermore, they may not be financially savvy. On-line strategies occasionally renegotiate the asset portion in light of the anticipated movement conduct. Predications are gotten from the estimations of the activity and Quality of Service perceptions. These on-line strategies don't have the issues related with disconnected methods. These techniques may experience the ill effects of an expansive number of renegotiations and need to depend on an exceptionally complex estimation and portion calculation.

1.2 Mobile Agent

A Mobile Agent, specifically, is a kind of programming specialist, with the element of independence, social capacity, learning, and most altogether, portability. All the more particularly, a versatile operator is a procedure that can transport its state starting with one condition then onto the next, with its information in place, and be equipped for performing suitably in the new condition. Portable operators choose when and where to move. Development is regularly advanced from Remote procedure calls strategies. Similarly as a client guides an Internet program to "visit" a site (the program simply downloads a duplicate of the website or one variant of it on account of dynamic sites), comparatively, a portable specialist fulfills a travel through information duplication. At the point when a portable specialist chooses to move, it spares its own state (prepare picture), transports this spared state to the new host, and continues execution from the spared state.

1.3 Comparison between Client Server Model and Mobile Agent Paradigm

Customer server demonstrate involve no under two projects, i.e., a client side program and a server side program and regularly spare codes for trades, including remarkable dealing with. The issue of a beneficial data transfer capacity circulation figuring in which dispersed registering needs cooperation's between various computer networks through a system. The idleness and system movement of connections regularly truly impact the quality and coordination of two projects running on different diverse PCs.

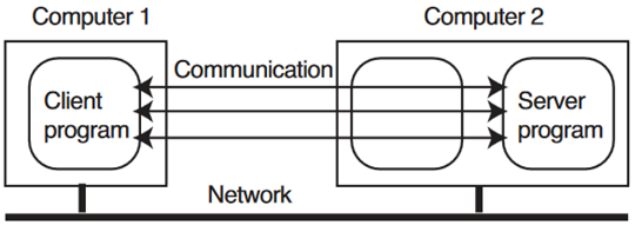

Fig -1: Communication problem in client-server approach

As should be obvious from Figure 2, in the event that one of the projects is a versatile specialist, it can relocate to the PC the other is running on speak with it locally. That is, versatile specialist innovation empowers remote interchanges to work as nearby correspondences.

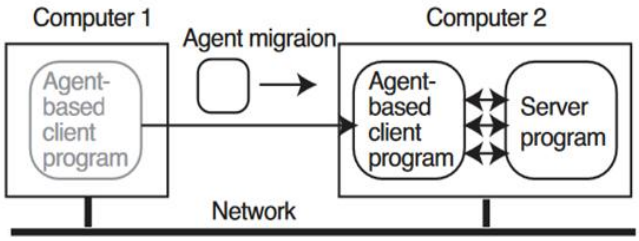

Fig -2: Agent migration helps in communication in mobile agent approach

1.4 System Design

User enters search query or keyword related to multimedia on demand advertisements in GUI. Video management system based on mobile agent will handle all sort of queries and yields appropriate result.

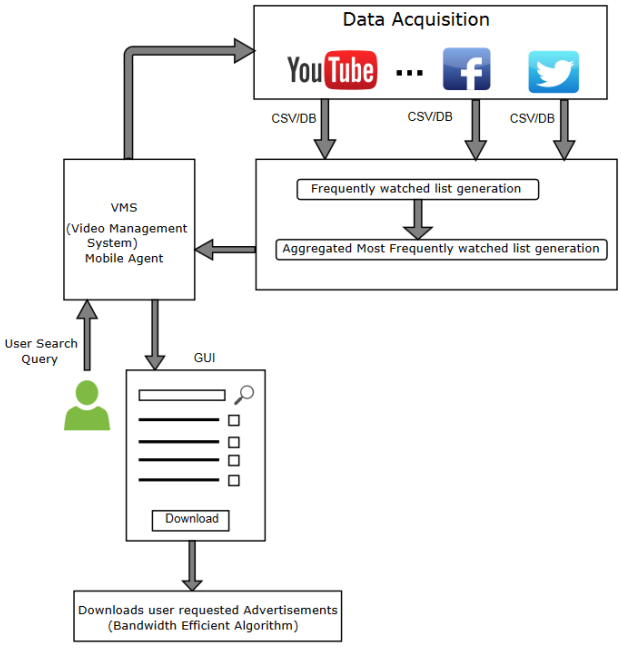

Fig -3: System Design

Video management system using mobile agent will send the user input to fetch social media statistical data. Data acquisition will be handled in background. Mobile agent will fetch the user search query based YouTube, Facebook social media channels details. Mobile agent will save the corresponding statistics data in the form of csv files. Mobile agent will sort the csv files data as most frequently viewed list by using VB macro to sort out the view count column. Mobile agent will display the appropriate result on GUI. User will select the required advertisements to construct download. Once user press the button construct download , mobile agent will navigate to the download links file and sort out the view count column. In this way we can prepare the most frequently viewed list and generates most popular and average videos. Mobile agent will download the construct download links.

After the text edit has been completed, the paper is ready for the template. Duplicate the template file by using the Save As command, and use the naming convention prescribed by your conference for the name of your paper. In this newly created file, highlight all of the contents and import your prepared text file. You are now ready to style your paper.

1.4 Methodology

There are four phases identified in this scenario.

1: To collect number of views and downloads for the on-demand multimedia advertisement for the requested multimedia advertisement from the predefined ad-publisher websites.

2: To prioritize the on-demand multimedia advertisement collected from the phase one.

3: To process phase second output , it might be containing errors, inaccurate values and redundant. Hence, cleaning and classification will be carried out. Here we apply any existing classification algorithm to classify on-demand multimedia advertisements like popular, medium and average.

4: To provide on-demand multimedia advertisements to the user by using mobile agents and bandwidth distribution.

2. Algorithms

On-Demand Multimedia Advertisements Requesting Segment:

Input :

Query/keyword :User requested search query or keyword.

Query CSV : CSV file consists of social media statistical data.

Selected Advertisements : Selected multimedia advertisements from the user to download .

Query CSV: Social media statistical data needs to be scheduled in such a way that, data in the csv files should be arranged in ascending order based on key factor view count. It can be sorted out based on key factor such as view count or comments count or like count etc., --mobile agent. VB macro can be run to sort the data in query csv.

Output: Selected advertisements will be added to construct download file based on scheduled manner.

On-Demand Multimedia Advertisements Sending Segment:

Input:

Download links : Construct download links file consist of requested multimedia advertisements.

No. of Advertisements : It consist of row count illustrating the number of multimedia advertisements.

View Count : It consist of view count statistical data for the corresponding advertisement.

URL : It consist of multimedia advertisements current active state of URL.

Description : It consist of description about the multimedia advertisement.

Scheduling : VB macro needs to run to sort out view count column to generate aggregated most frequently watched multimedia advertisements.

Output : Sorted download links file based on the key factor view count.

On-Demand Multimedia Advertisements Downloading Segment:

Input:

Download Links : File consist of all the details about download requests from the user and aggregated results.

Scheduling Bandwidth:

```
for(int i=0;i<download_links.length;i++)

if (download_links[i].exists())

        System.out.println("Advertisement already exist and no need to download it
                    again from central media server");

else

if(download_links[i].isPopularList())

        for(int j=0;j<downloadPopularList;j++)

        // trigger mobile agents to download advertisements

        Vget.ConstructDownload(download_links_popular list,download_links[i].URL);

else

        for(int j=0;j<downloadAverageList;j++)

        // trigger mobile agents to download advertisements

        Vget.ConstructDownload(download_links_average list,download_links[i].URL);

//end
```

Output: Advertisements downloaded at the specified path.

3. Experimental Results

New aglet creation will accepts code base and url as the input. We can select the project from the specified lists attribute values from the saved aglets. GUI - Graphical user interface which has been chosen for demonstrating the bandwidth efficient on demand multimedia advertisements is illustrated below with pictorial representation. It accepts keyword for search as in input. It is the only input text field

from the gui. Search button is pressed means , mobile agent will read the corresponding specified text field keyword value and fetch statistical data which has been collected from the mobile agents from the previous step that is data fetching. Mobile agent will read the statistical data which has been collected and put it as Jtable format in the GUI. User can select the appropriate required files which needs to downloaded. Based on the key factor that is number of view counts is considered here as the main factor. Hence, csv file will be sorted out from the largest to shortest values from the view count column.

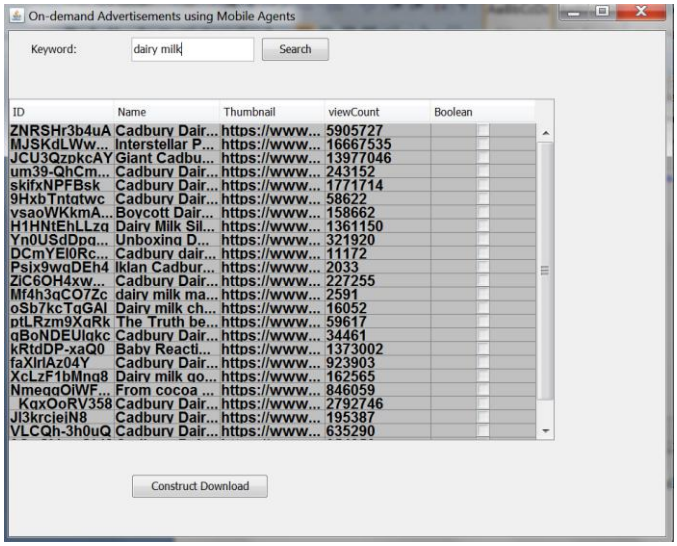

Fig - 4 : Aglet user interface with keyword = "dairy milk"

Once the advertisements chosen from the user, if these files needs to be downloaded means, construct download needs to be pushed. Here construct download is a pushbutton. Once the selection is done by the user means, construct download can be pushed. Mobile agents will create the downloadlinks.csv file. Which consist of download url and name, description. Format of downloadlinks.csv is as follows. Which consist of downloader url , view count and name description of the searched keyword. Mobile agents aglet will create the list of requested on demand multimedia advertisements corresponding download url link, view count and description in download links csv file in a structured manner.

3.1 Construct Download Links

Mobile agent will construct the download. To arrange download links in an ordered manner we are using VB macro. By using vb macro we are sorting the view count column of download links file. Sorting will takes place from largest to shortest value. So it follows descending order to get the most popular on demand advertisements based on the key factor view count.

	A	B	C
1	https://www.youtube.com/watch?v=y0ltsNMVqvk	Reason for the bad results in	5215
2	https://www.youtube.com/watch?v=HndV87XpkWg	What's Education For?	500287
3	https://www.youtube.com/watch?v=V8VU4vakUWg	HARDCORE EDUCATION - Nob	70160
4	https://www.youtube.com/watch?v=H0EhV9pNk8o	Aryan Khan Lifestyle_Net Wor	50953
5	https://www.youtube.com/watch?v=UfmFIEh2QjU	5 Reasons Why Finland Is A G	577954
6	https://www.youtube.com/watch?v=o9lQz78yCe0	China's Education Vs. Western	11874
7	https://www.youtube.com/watch?v=9Q7Zl3OI4us	The 3 Myths of the Indian Edu	121129
8	https://www.youtube.com/watch?v=pdkHZSnzofY	meaning of education by Swa	18833
9	https://www.youtube.com/watch?v=pdkHZSnzofY	meaning of education by Swa	18833
10	https://www.youtube.com/watch?v=HN9P8uHEtUg	Which Countries Have The Be	743537
11	https://www.youtube.com/watch?v=dS2lLiSsoyM	EIC: Education Then vs Now	3792134

Fig - 5 : Download links csv file format with download url, view count and name description

```
' Macro6 Macro
'
' Keyboard Shortcut: Ctrl+t
'
    Columns("A:A").Select
    ActiveSheet.Range("$A$1:$A$13").RemoveDuplicates Columns:=1, Header:=xlNo
    Selection.TextToColumns Destination:=Range("A1"), DataType:=xlDelimited, _
        TextQualifier:=xlNone, ConsecutiveDelimiter:=True, Tab:=True, Semicolon _
        :=True, Comma:=True, Space:=False, Other:=False, FieldInfo:=Array( _
        Array(1, 1), Array(2, 1)), TrailingMinusNumbers:=True
    Columns("B:B").Select
    ActiveWorkbook.Worksheets("downloadlinks").sort.SortFields.Clear
    ActiveWorkbook.Worksheets("downloadlinks").sort.SortFields.Add Key:=Range( _
        "B1:B13"), SortOn:=xlSortOnValues, Order:=xlDescending, DataOption:= _
        xlSortNormal
    With ActiveWorkbook.Worksheets("downloadlinks").sort
        .SetRange Range("B1:B13")
        .Header = xlGuess
        .MatchCase = False
        .Orientation = xlTopToBottom
        .SortMethod = xlPinYin
        .Apply
    End With
    Columns("A:A").ColumnWidth = 31.73
    Columns("A:A").ColumnWidth = 56.45
    Range("A2:A14").Select
End Sub
```

Fig - 6: Illustrating the vb macro which has been used to sort the view count values of download links csv file

	A	B	C
1	https://www.youtube.com/watch?v=y0ltsNMVqvk	Reason for the bad results in 12th o	3792134
2	https://www.youtube.com/watch?v=HndV87XpkWg	What's Education For?	743537
3	https://www.youtube.com/watch?v=V8VU4vakUWg	HARDCORE EDUCATION - Noble Rea	577954
4	https://www.youtube.com/watch?v=H0EhV9pNk8o	Aryan Khan Lifestyle_Net Worth_Hc	500287
5	https://www.youtube.com/watch?v=UfmFIEh2QjU	5 Reasons Why Finland Is A Global E	121129
6	https://www.youtube.com/watch?v=o9lQz78yCe0	China's Education Vs. Western Educ	70160
7	https://www.youtube.com/watch?v=9Q7Zl3OI4us	The 3 Myths of the Indian Educatior	50953
8	https://www.youtube.com/watch?v=pdkHZSnzofY	meaning of education by Swami Viv	18833
9	https://www.youtube.com/watch?v=pdkHZSnzofY	meaning of education by Swami Viv	18833
10	https://www.youtube.com/watch?v=HN9P8uHEtUg	Which Countries Have The Best Edu	11874
11	https://www.youtube.com/watch?v=dS2lLiSsoyM	EIC: Education Then vs Now	5215

Fig - 7: Download links csv file after the sorting vb macro applied

View count column from download link csv file is sorted in descending order that is from largest view count to shortest view count. Construct download will utilize the existing download library manager vget. By using existing download library manager we can ease up the process of downloading the requested files which has been constructed by "construct download". As explained earlier , vget download manager will download the user demanded advertisements based on modified efficient bandwidth allocation algorithm. Which will lead to efficient distribution of bandwidth by mobile agents.

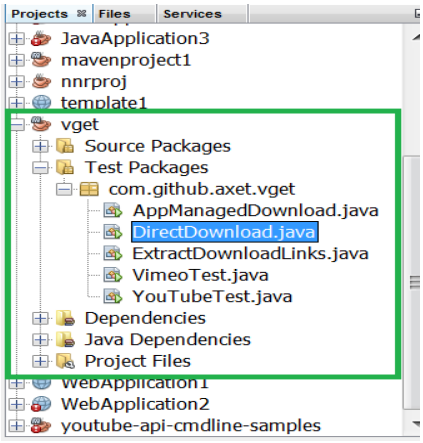

Fig - 8: Tree hierarchical structure of vget download manager

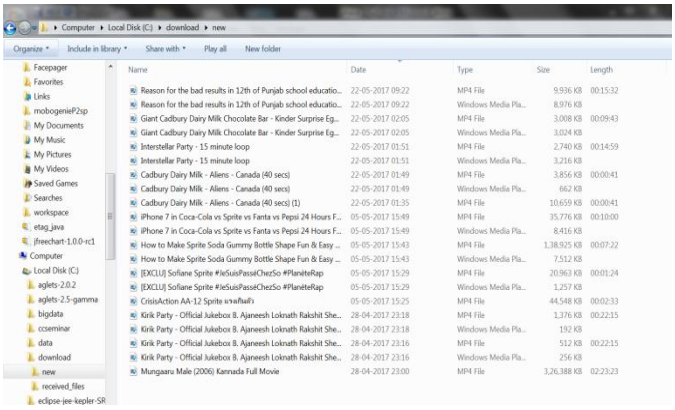

Fig - 9: Illustrating the files which has been downloaded based on user demand

Fig - 10: Playing downloaded advertisements

4. Conclusions

In this work , we have made an attempt to apply the mobile agents paradigm for on-demand multimedia advertisements to distribute the productive bandwidth for the high priority advertisements. The proposed work efficiently utilizes the effective features of mobile agents that parallel migrates to retrieve the statistical data of advertisement. For the given user search query , corresponding statistical data is used to categorize the advertisements. Search query process will display the populated statistical data to the user. Based on user requirements , mobile agent will construct the download and apply the efficient bandwidth allocation algorithm. The use of mobile agent paradigm, overcomes the drawback of the existing client/server model in terms of network traffic as it executes asynchronously and autonomously, efficient bandwidth utilization and reduces the network load. Hence mobile agent paradigm leads to most promising results of bandwidth allocation.

A mobile agent paradigm which effectively distributes the productive bandwidth for the high priority on-demand multimedia advertisements. Here the mobile agents migrates parallel to the registered public websites to retrieve the number of view counts, like counts, dislike counts and comments counts for the requested on-demand multimedia advertisement. Mobile agent will priorities the demanded advertisement. As the user make a request for the advertisement mobile agent efficiently check the associated view count for the corresponding on-demand multimedia advertisement and allocates bandwidth by using efficient bandwidth allocation algorithm. Which reduces advertisements rejection ratio also increases productive bandwidth distribution. Bandwidth will be initially assigned to most popular category based advertisements and at the same time portion of bandwidth will be assigned to average advertisements category as well. Hence mobile agent paradigm leads to most promising results of bandwidth allocation. So, mobile agent paradigm will reduce the video rejection ratio and leads to the efficient usage of bandwidth.

Acknowledgement

I take this humble opportunity to express my deep sense of gratitude to Project Guide Mrs. Roopa G M, Assistant Professor, Department of Computer Science and Engineering, B.I.E.T., Davangere, for her valuable guidance and continual encouragement and assistance provided for the completion of this project. I would also like to extend my gratitude to all my family members and friends especially for their advice and moral support.

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