International Journal of Research
International Journal of Research (IJR)
e-ISSN: 2348-6848, p- ISSN: 2348-795X Volume 3, Issue 01, January 2016
Available at http://internationaljournalofresearch.org

A Novel VOD On-Line Social Networks0 Peer-To-Peer Networks &Assisted

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Abstract

Video sharing has been a gradually more popularapplication in OSNs facilitating users to share theirpersonal videos or interesting videos they found withtheir friends. However OSN's additional progress isstrictly caught up by the inherent limits of theconventional client/server architecture of its videosharing system which is not only costly in terms ofserver storage and bandwidth but also not scalablewith the high amount of users and video content inOSNs.Nowadays network group, Peer-To-Peer (P2P) network is exploring as a good candidate for resource sharing over the Internet. Compared with traditional file sharing workloads, continuous streaming of multimedia content provokes a significant amount of today's internet traffic. Streaming media has various real-time constraints such as insufficient memory, high bandwidth utilization for large-scale media objects and lack of cooperation between proxies and their clients. Therefore, Sharing of large multimedia objects between similar interests has become predominantly important for on demand video streaming applications. Existing P2P assisted sharing scheme clusters the peers based on similar interest and locality to improve the streaming performance under limited storage constraints.

Keywords: Introduction Video-On-Demand (Vod); On-Line Social Networks; Peer-To-Peer Networks; Peer-To-Peer Assisted Vod

1. Introduction

Online social networks (OSNs) (e.g., Facebook, Twitter) arenow among the most popular sites on the Web. An OSNprovides a powerful means of establishing social connectionsand sharing, organizing, and finding content. OSN usersestablish friendship relations with real world friends or virtualfriends, and post their profiles and content such as photos,videos, and notes to their personal pages. Video sharing hasbeen an increasingly popular application in online socialnetworks (OSNs). Facebook is now the second-largest onlinevideo viewing platform. The total time spent on videoviewing on Facebook increased 1,840% year-over-year, from34.9 million minutes in October 2008 to 677.0 millionminutes in October 2009 [1]. For example, Face bookpresently has over 500 million users. Unlike current file orvideo sharing systems (e.g., Bit Torrent and YouTube), [8]which are mainly organized around content, OSNs areorganized around users. OSN users establish friendshiprelations [10] with real world friends or virtual friends, andpost their profiles and content such as photos, videos, andnotes to their personal pages.

OSNs are transforming from a platform for catching up withfriends to a venue for personal expression and for sharing afull variety of content and information. However, OSN'sfurther advancement is severely hindered by the intrinsiclimits [4] of the conventional client/server architecture of itsvideo sharing system, which is not only costly in terms ofserver storage and bandwidth but also not scalable with thesoaring amount of users and video content in OSNs.

Video sharinghas been an increasingly popular application in OSNs,enabling users to share their personal videos or interestingvideos they found with their friends. Indeed, according tocomScore Releases in Au-gust 2010, Facebook is now thesecond-largest online video viewing platform. The totaltime spent on video viewing on Facebook increased1,840% year-over-year, from 34.9 million minutes inOctober 2008 to 677.0 million minutes in October 2009.During the same time period, the number of unique videoviewer increased by 548% and total number of streamsgrew by 987% [1].

Different approaches for peer assisted video sharingin online social networks are: NetTube, SocialTube,etc. OSN based P2P streaming overlay, where socialrelationships are exploited to develop a privilegedvideo content distribution mechanism among peers thatare also OSN members. In this method an OSN memberthat newly joins the P2P overlay and meets difficultyin finding portions of the video, is allowed to contact thoseamong its OSN friends that fall in the list of thepotential parent peers, and to ask for their help. Uponreceiving such a request, the contacted peers searchamong their children, looking for a peer that does notbelong to the OSN, and if they find one, its connectionis discarded, to make room for the mate in need for thecontent.

Consequently, it is beneficial to develop amethod to enable forums to share multimedia contentsin a well-organized, inexpensive and user-friendlymanner. Specifically, multimedia content should be sharedin a way such that the bandwidth cost will remain within arange acceptable by forum runners and the intensity ofserver access will not exceed a typical web servers'capacity. As a result we proposed a peer-assistedmultimedia sharing system, called Multimedia Board(MBoard) that leverages forum characteristics to provideforums with their own multimedia sharing capabilities inorder to reduce bandwidth cost. This work does not liein the improvement of existing P2P networks, butadopting existing P2P techniques suitable for forums toimprove the performance of multimedia sharing inforums. When a node is downloading and viewing mediacontent, it can upload the content simultaneously.

2. Related Work

It present our Facebook trace measurement resultsand give an in-depth perspective of Facebook videoviewing patterns, that shows the necessity of peerassistance in OSN video sharing and provides adirection for the design of a P2P video sharingsystem in OSNs We used breadth-first-search [23] toquery over 1,000,000 users seeded by 5 users in theUSA. In order to avoid overloading the Facebook, wesent a query to Facebook every 5s. We can only seethe video activities of the users who are friends orFOFs of the crawler and the users that chose“everyone” as their video access option. Because ofthis access limit, we only found about 2,500 videosand 12,000 users who watched these videos duringthe time period from Jul. 2007 to Aug. 2010, which isused as a sample for the video sharing and watchingactivities. The collected dataset includes theinformation about user friendship relations, interests,locations, and videos uploaded and shared by users.For each video, we retrieved the video metadata suchas its title, length, and viewers when available. Torespect the privacy of the users, we anonymize theuser names before storing the data in our database.

2.1 Popularity of Videos on Facebook:

We investigate the popularity of videos on Facebookover the years. Figure 1 plots the number of videoscorresponding to the time they are uploaded in ourcollected video pool. It shows that the number ofvideos uploaded to Facebook increases sharply alongwith time. Since Facebook launched its video servicein 2007, the increasing trend of video uploading hasnever slowed down, making it one of most popular applications on Facebook. Figure 2 shows the videolength distribution in our collected video pool. Fromthe figure, we can see that about 70% of the videosare less than 100 seconds. Videos longer than 200seconds account for less than 10% of all videos. Itmay be because users generally share short usergenerated videos of their lives with their friends inOSNs.

2.2 Effect of Interest on Video Viewing Pattern

It explores the correlation between user interests andvideo viewing patterns. We selected a sample of 118distinct users that watched more than one video fromour dataset and manually classified the videos theywatched into 19 interest groups based on videocontent. The 19 interest groups were determinedbased on the video categories in YouTube such asgaming, rock music and action movie. A user canpost on Facebook either self-uploaded videos orexternal video links from a third party video serviceprovider such as YouTube. The video linking inFacebook is called “share”, by which users can sharelinks to videos they find interesting with their friends.

2.3 **Social Network based P2P Overlay Construction Algorithm:**

To identify followers and non-followers of a sourcenode for structure construction, SocialTube predefines two thresholds, Th and Tl, for the percent ofvideos in the source node that a viewer has watchedduring a time unit, say one week. If the percent valueof a viewer is ≥ Th, the viewer is a follower. If thepercent is Tl< x ≤ Th, the viewer is a nonfollower.Video sharing in Facebook distinguishesitself from other video sharing websites (e.g.,YouTube) in two aspects: video sharing scope andvideo watching incentives. First, other websitesprovide system-wide video sharing where a user canwatch any video, while in Facebook; videos areusually shared in a 2-hop small circle of friends.Second, users in other video sharing websites aredriven to watch videos by interests, while inFacebook, the followers of a source node (i.e.videoowner) are driven to watch almost all of the source’svideos primarily by social relationship, and nonfollowers watch a certain amount of videos mainlydriven by interest.

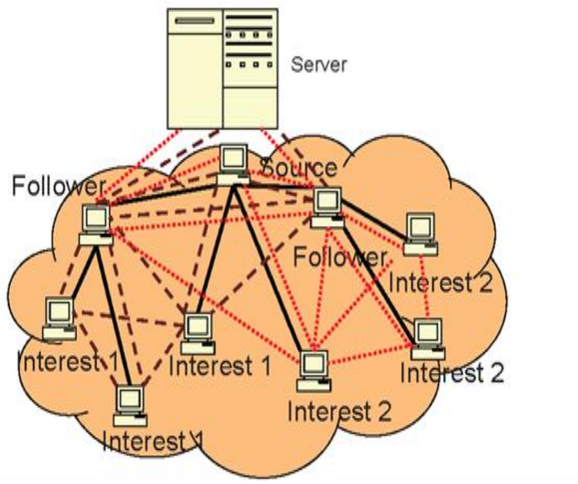

Fig 1: Structure of Social Tube

Social Network based Prefetching Algorithm:

To reduce the video startup latency, we propose apush based video prefetching mechanism inSocialTube. In SocialTube Once the nodes requestthe videos; the locally stored prefix can be playedimmediately without delay.Meanwhile, the node triesto retrieve remaining video from its Swarm peers.

3. Implementation

A. User Interface Design

This is the first module of our project. User InterfaceDesign plays an important role for the user to movelogin window to user window. This module hascreated for the security purpose. In this login page wehave to enter login user id and password. It willcheck username and password is match or not (validuser id and valid password). If we enter any invalidusername or password we can't enter into loginwindow to user window it will shows error message.So we are preventing from unauthorized user enteringinto the login window to user window. It will providea good security for our project. So server contain userid and password server also check the authenticationof the user. It well improves the security andpreventing from unauthorized user enters into thenetwork. In our project we are using jsp for creatingdesign. Here we validate the login user and severauthentication.

B. Creating Social Relationship

This is the second module of our project in this weare going to collecting the all registered user detailsfrom database and matching with currentlyregistering user details based upon that we canspecifies the some related friends when he his loginto our SN. After users in other video sharing websitesare driven to watch videos by interests, while inSocial Network, the followers of a source node (i.e.,video owner) are driven to watch almost all of thesource's videos primarily by social relationship, andnon-followers watch a certain amount of videosmainly driven by interest (I2). According to thesedifferentiating aspects, we design the P2P overlaystructure.

C. Implementing P2P overlay construction

This is the third module of our project in this we aregoing construct P2P overlay, for each source node. Itconsists of peers within 2 hops to the source thatwatch at least a certain percentage of the source'svideos. Other peers can still fetch videos from theserver. In this peers of a source node S in the socialnetwork constitute a P2P overlay for the source node.We aim to achieve an optimal tradeoff between P2Poverlay maintenance costs and video sharingefficiency. Some nodes within 2 hops may watchonly a few videos in a source. Including these nodesand users beyond 2-hops into the overlay generates agreater structure maintenance cost than video sharingbenefits. Based on I2, we build a hierarchicalstructure that connects a source node with itssocially-close followers, and connects the followerswith other non-followers. Thus, the followers canquickly receive chunks from the source node, andalso function as a pseudo-source to distribute chunksto other friends.

4. Experimental Work

A. PERFORMANCE EVALUATION

We evaluate the performance of SocialTube through both simulations on the event-driven simulatorPeerSim and PlanetLab prototype implementation. We run each experiment for 10 times and report results within 95% confidential intervals.

TABLE 1: Bandwidth capacity and distribution of users

Groups	Downloading bandwidth	Uploading band-width	Percentage of nodes
1.	768k/s	128k/s	21.4%
2.	1536k/s	384k/s	23.3%
3.	3072k/s	768k/s	55.3%

B. EXPERIMENT SETTINGS

We compare the performance of SocialTube with other N representative works in peer-assisted video streaming, PA-VoD [8], NetTube [9] and Random (as a baseline).In PA-VoD, physically close peers with the same location ID are clustered for video sharing between each other.

TABLE 2: Experiment default parameters.

Parameter	Default value
Number of clients	5,000
Number of videos	2,000
Number of interest categories	19
Number of interests per client	2-4
Trace duration	40 days
Chunk size	3 MBytes
Prefix length	3 MBytes
Server uploading bandwidth	20Mbps
Video size	Distribution of YouTube videos
Cache size	300MBytes

Prefetching accuracy:

This is the probability that auser requests a video whose prefix is in its cache andit can access the prefix's video

Startup delay:

This is the time elapsed after a nodeselects a video and before the video starts to play.This metric reflects the effectiveness of a prefetchingmechanism.

Buffering delay.

This is the total time for a user toreceive a certain number of chunks after sending outa video request.Average overlay maintenance cost. This is thenumber of communication messages betweenneighboring nodes for overlay maintenance.

5. Conclusion

Video sharing is an increasingly popular application in OSNs.However, the client/server architecture deployed by currentvideo sharing systems in OSNs costs a large amount ofresources (i.e. money, server storage) for the service providerand lacks scalability. Meanwhile, because of the privacyconstraints in OSNs, the current peer-assisted Video-onDemand (VoD) techniques [7] are suboptimal if not entirelyapplicable to the video sharing in OSNs. In this paper, wecrawled video watching trace data in one of the largest onlinesocial network websites Facebook, from Jul. 2007 to Aug.2010 and explored the users' video viewing patterns. Wefound that in a user's viewer group, 25% viewers watched allvideos of the user driven by social relationship, [10] and theviewing pattern of the remaining nodes is driven by interest.Based on the observed social and interest relationship invideo watching activities, we propose Social Tube, whichprovides efficient P2P-assisted video sharing services.Extensive simulation results show that Social Tube canprovide a low video startup delay [4] and low server trafficdemand.

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