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Enhancing the Geological Prognosis to Share Video for Online Social Networks

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***Abstract*- Video sharing has been an increasingly popular application in online social networks (OSNs). However, its sustainable development is severely hindered by the intrinsic limit of the client/server architecture deployed in current OSN video systems, which is not only costly in terms of server bandwidth and storage but also not scalable with the soaring amount of users and video content . The peer-assisted Video-on-Demand (VoD) technique, in which participating peers assist the server in delivering video content has been proposed recently. Unfortunately, videos can only be disseminated through friends in OSNs. Therefore, current VoD works that explore clustering nodes with similar interests or close location for high performance are suboptimal, if not entirely inapplicable, in OSNs. Based on our long-term real-world measurement of over 1,000,000 users and 2,500 videos on Facebook, we propose SocialTube, a novel peer-assisted video sharing system that explores social relationship, interest similarity, and physical location between peers in OSNs.**

Keywords: Video on demand (VOD), Content delivery networks (CDN), Peer-assisted video on-demand (PA-VoD).

I. INTRODUCTION:

Online social networks (OSNs) (e.g., Facebook, Twitter) are now among the most popular sites on the Web. An OSN provides a powerful means of establishing social connections and sharing, organizing, and finding content. OSN users establish friendship relations with real world friends or virtual friends, and post their profiles and content such as photos, videos, and notes to their personal pages. Video sharing has been an increasingly popular application in online social networks (OSNs). Facebook is now the second-largest online video viewing platform. The total time spent on video viewing on Facebook increased 1,840% year-over-year, from 34.9 million minutes in October 2008 to 677.0 million minutes in October 2009 [1]. For example, Facebook presently has over 500 million users. Unlike current file or video sharing systems (e.g., BitTorrent and YouTube), [8] which are mainly organized around content, OSNs are organized around users. OSN users establish friendship relations [10] with real world friends or virtual friends, and post their profiles and content such as photos, videos, and notes to their personal pages.

OSNs are transforming from a platform for catching up with friends to a venue for personal expression and for sharing a full variety of content and information. However, OSN's further advancement is severely hindered by the intrinsic limits [4] of the conventional client/server architecture of its video sharing system, which is not only costly in terms of server storage and bandwidth but also not scalable with the soaring amount of users and video content in OSNs.

II. EXPERIMENTAL INVESTIGATION:

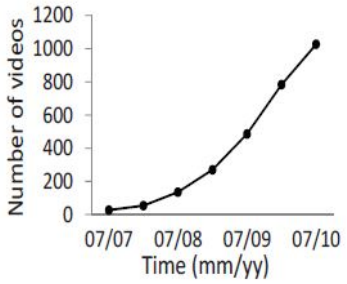


Fig.1 Numbers of Video uploaded

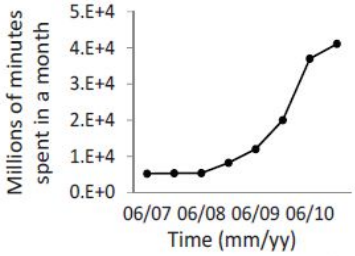


Fig.2 Time spend on Facebook

A. The most popular application on Facebook

we investigate [1] the popularity of videos on Facebook over the years. It show from Fig.1 that the number of videos uploaded to Facebook increases sharply along with time. Since Facebook launched its video service in 2007, the increasing trend of video uploading has never slowed down, making it one of most popular applications on Facebook.

From Fig.2 It is clear that the total time users spent on Facebook has been increasing quickly users on average spent 9.9% of their total online time on Facebook [3]. It was reported that web users spend more time on Facebook than Google sites. On average, more than 8 billion minutes are spent on Facebook every day. As long as a user is online, his/her cached videos can be fetched for P2P video sharing.

This makes a P2P video sharing [6] system very suitable for Facebook since a fundamental prerequisite of P2P video sharing systems is that there are enough peers online to participate in video sharing.

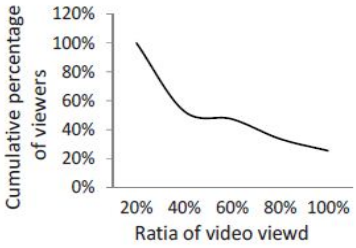


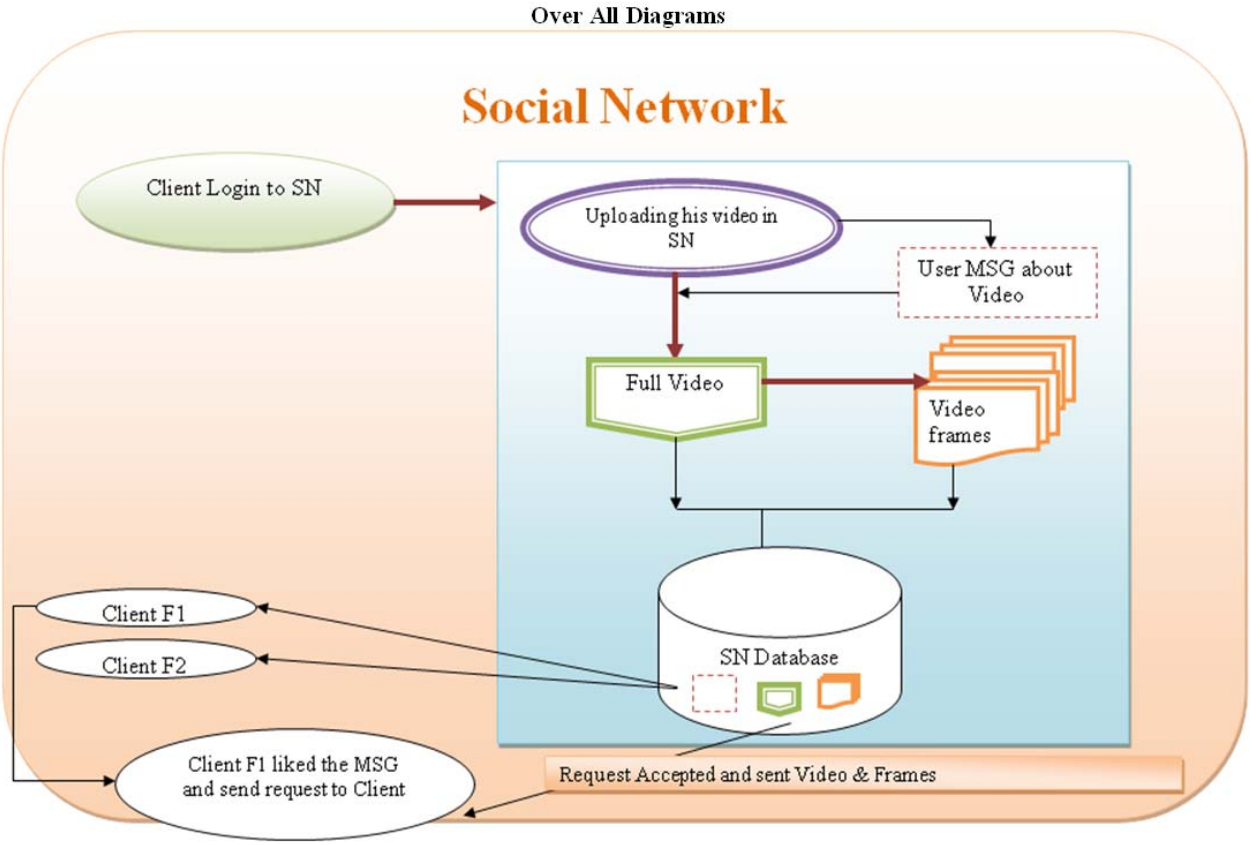
Fig.3 Different viewer types

B. Effect of Interest on Video Viewing Pattern

From Fig.3 we have explore that the correlation between user interests and video viewing patterns [3]. We selected a sample of 118 distinct users that watched more than one video from our dataset and manually classified the videos they watched into 19 interest groups based on video content.The 19 interest groups were determined based on the video categories in YouTube [8] such as gaming, rock music and action movie. For each user, we calculated the percentage of viewed videos of each interest group. Then, we ranked these 19 interest groups in descending order of the percentage values. The result implies that the videos each user watches are generally orientated towards his/her few primary interests.

III. THE DESIGN OF SOCIAL TUBE

Our measurement reveals that most of the viewers of a user's videos are the user's close friends, most video views are driven by social relationships, and the rest are driven by interests, and viewers of the same video tend to reside in the same location. Based on our observations, we propose Social Tube, a system that explores the social relationship, interest similarity [3] and location to enhance the performance of video sharing in OSNs. Specifically, an OSN has a social network (SN)-based P2P overlay construction algorithm [1] that clusters peers based on their social relationships and interests. Within each cluster [2], nodes are connected by virtue of their physical location in order to reduce video transmission latency. Social Tube also incorporates an SN-based chunk prefetching algorithm to minimize video playback startup delay.



ALGORITHMS USED:

A social network (SN)-based P2P overlay construction algorithm

Definition: Peers are connected into a logical overlay structure [1] emulating a multicast network. Since data is replicated at the application layer through a set of uncast connections formed at each peer, such systems are undoubtedly less efficient than IP multicast in terms of network usage.

ASN-Based Chunk Prefetching Algorithm

*Definition:*In this algorithm, every peer node maintains the record of playback media chunks (video divided into media chunks) by other peers in the same session-interval. This information is obtained through mutual sharing basis. After collecting state information from all peers (in same session-interval), a table of available media chunks is constructed by each peer in that particular session interval.

Chunk Delivery and Scheduling Algorithm

Definition:The algorithm proceeds by steps, described as follows. At the i-th step the supplier node n takes a decision on:

1) Which chunk c(i) to upload, chosen among the received ones;
2) How many neighbors N(i) to upload simultaneously the chunk to;
3) Which neighbors {p1, p2, ..., pN(i) } to upload the chunk to.

Buffer Management Algorithm

Definition: In buffer management algorithms, how to control the buffer space occupation is very key. Here we define

$$\frac{C_i}{W_i} = \frac{C_j}{W_j}$$

Where *Ci* is the buffer space occupation, and *Wi* expresses the synthetic weight of the service flow *i*. When the cache is full, the service flow with the largest value of *Ci /Wi* will be dropped in order to guarantee fairness. Here the fairness is reflected in packets with different queue length. Assume that *ui* is the weight, and *vi* is the current queue length of the service flow *i.* The synthetic weight *Wi* can be calculated as described by

$$W_i = \alpha \times u_i + (1-\alpha) \times v_i$$

IV. CONCLUSION

Video sharing is an increasingly popular application in OSNs. However, the client/server architecture deployed by current video sharing systems in OSNs costs a large amount of resources (i.e. money, server storage) for the service provider and lacks scalability. Meanwhile, because of the privacy constraints in OSNs, the current peer-assisted Video-on-Demand (VoD) techniques [7] are suboptimal if not entirely applicable to the video sharing in OSNs. In this paper, we crawled video watching trace data in one of the largest online social network websites Facebook, from Jul. 2007 to Aug. 2010 and explored the users' video viewing patterns. We found that in a user's viewer group, 25% viewers watched all videos of the user driven by social relationship, [10] and the viewing pattern of the remaining nodes is driven by interest. Based on the observed social and interest relationship in video watching activities, we propose Social Tube, which provides efficient P2P-assisted video sharing services. Extensive simulation results show that Social Tube can provide a low video startup delay [4] and low server traffic demand.

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