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TRUST-BASED VIDEO MANAGEMENT FRAMEWORK FOR SOCIAL MULTIMEDIA NETWORKS

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Abstract —In this paper,Social Multimedia Networks (SMNs) have attracted much attention from both academia and industry due to their impact on our daily lives. The requirements of SMN users are increasing along with time, which make the satisfaction of those requirements a very challenging process. One important challenge facing SMNs consists of their internal users that can upload and manipulate insecure, untrusted and unauthorized contents.For this purpose, controlling and verifying content delivered to end-users is becoming a highly challenging process. So far, many researchers have investigated the possibilities of implementing a trustworthy SMN. In this vein, the aim of this paper is to propose a framework that allows collaboration between humans and machines to ensure secure delivery of trusted videos content over SMNs while ensuring an optimal deployment cost in the form of CPU, RAM, and storage. The key concepts beneath the proposed framework consist in i) assigning to each user a level of trust based on his/her history, ii) creating an intelligent agent that decides which content can be automatically published on the network and which content should be reviewed or rejected, and iii) checking the videos' integrity and delivery during the streaming process. Accordingly, we ensure that the trust level of the SMNs increases. Simultaneously, efficient Capital Expenditure (CAPEX) and Operational Expenditures (OPEX) can be achieved.

Index Terms—Social multimedia network, video streaming,trust model, and trust management.

INTRODUCTION

A distributed system may have a common goal, such as solving a large computational problem.] Alternatively, each computer may have its own user with individual needs, and the purpose of the distributed system is to coordinate the use of shared resources or provide communication services to the users.

Other typical properties of distributed systems include the following:

- The system has to tolerate failures in individual computers.

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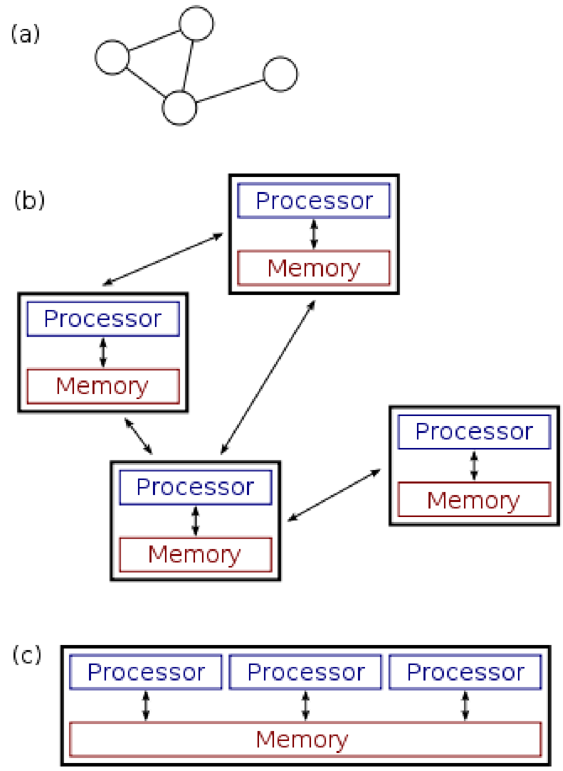
- The structure of the system (network topology, network latency, number of computers) is not known in advance, the system may consist of different kinds of computers and network links, and the system may change during the execution of a distributed program.
- Each computer has only a limited, incomplete view of the system. Each computer may know only one part of the input.

Distributed systems are groups of networked computers, which have the same goal for their work. The terms "concurrent computing", "parallel computing", and "distributed computing" have a lot of overlap, and no clear distinction exists between them. The same system may be characterised both as "parallel" and "distributed"; the processors in a typical distributed system run concurrently in parallel. Parallel computing may be seen as a particular tightly coupled form of distributed computing, and distributed computing may be seen as a loosely coupled form of parallel computing. Nevertheless, it is possible to roughly classify concurrent systems as "parallel" or "distributed" using the following criteria:

- In parallel computing, all processors may have access to a shared memory to exchange information between processors.
- In distributed computing, each processor has its own private memory (distributed memory). Information is exchanged by passing messages between the processors.



The figure on the right illustrates the difference between distributed and parallel systems. Figure (a) is a schematic view of a typical distributed system; as usual, the system is represented as a network topology in which each node is a computer and each line connecting the nodes is a communication link. Figure (b) shows the same distributed system in more detail: each computer has its own local memory, and information can be exchanged only by passing messages from one node to another by using the available communication links. Figure (c) shows a parallel system in which each processor has a direct access to a shared memory.

LITERATURE SURVEY

1) Insight into the P2P-VoD system: Performance modeling and analysis

AUTHORS: K. Wang and C. Lin

P2P-based video-on-demand (P2P-VoD) streaming service has recently emerged as a new paradigm of Internet application. Unlike streaming live content, P2P-VoD system require each user to contribute a small amount of storage since it has less synchrony in the users sharing video content. At the same time, new mechanisms for peer service scheduling are carefully designed. On briefly describing the architectural design based on the real system deployed by PPLive, we develop a stochastic model that seeks to expose the essential behavior of the PPLive P2P-VoD system. The performance evaluation followed shows that the system design of PPLive P2P-VoD system could guarantee good viewing quality, and sheds insight on the fundamental characteristics and limitations of the system quantitatively. Such theoretical analysis on P2P-VoD could help to improve the viewing quality and make such system more robust and scalable.

2) Challenges, design and analysis of a large-scale P2P VoD system.

AUTHORS: Y. Huang, Z. Fu, D. Chiu, C. Lui, and C. Huang

P2P file downloadig and streaming have already become very popular Internet applications. These systems dramatically reduce the server loading, and provide a platform for scalable content distribution, as long as there is interest for the content. P2P-based video-on-demand (P2P-VoD) is a new challenge for the P2P technology. Unlike streaming live content, P2P-VoD has less synchrony in the users sharing video content, therefore it is much more difficult to alleviate the server loading and at the same time maintaining the streaming performance. To compensate, a small storage is contributed by every peer, and new mechanisms for coordinating content replication, content discovery, and peer scheduling are carefully designed. In this paper, we describe and discuss the challenges and the architectural design issues of a large-scale P2P-VoD system based on the experiences of a real system deployed by PPLive. The system is also designed and instrumented with monitoring capability to measure both system and component specific performance metrics (for design improvements) as well as user satisfaction. After analyzing a large amount of collected data, we present a number of results on user behavior, various system performance metrics, including user satisfaction, and discuss what we observe based on the system design. The study of a real life system provides valuable insights for the future development of P2P-VoD technology.

PROPOSED SYSTEM

a system that explores the social relationship, interest similarity and location to enhance the performance of video sharing in OSNs. Specifically, an OSN has a social network (SN)-based P2P overlay construction algorithm that clusters peers based on their social relationships and interests. Within each cluster, nodes are connected by virtue of their physical location in order to reduce video transmission latency. SocialTube also incorporates an SN-based chunk prefetching algorithm to minimize video playback startup delay.

ADVANTAGES OF PROPOSED SYSTEM:

To our knowledge, this work is the first that studies the distinct characteristics of OSN video sharing that vary from other content-based system-wide video sharing, and builds a P2P-based video sharing system in an OSN by leveraging those characteristics for higher performance.

IMPLEMENTATION

MODULES DESCRIPTION:

1. OSN Server Module:

In this module, first implement the basic concepts and strategies used in SocialTube. In Facebook, each node can upload a video to the Facebook video server or an external link to a video from an external server. In this paper, we use server to represent all video source servers, including both Facebook and external video servers. Similar to current peer-assisted content delivery mechanisms, the peers in SocialTube store videos they have watched previously for video re-distribution. In SocialTube, a video is divided into small chunks with a fixed size. Thus, a video viewer only needs to download the corresponding chunks of the video segment (s)he wants to watch.

2. Social Distance and interest of video viewing:

Social distance between two users in the social network graph represents the closeness of their relationship. If two users are directly connected in the social network, their social distance is 1; if one user is a friend of another user's friend, then the social distance between them is 2, and so on. Note that a user may own more than one video. To further identify the impact of social relationships on video viewing patterns, we selected the users who have multiple videos from our dataset and inspected the viewer group of each video owner. We classified the viewers of a video owner based on the percentage of the owner's videos they watched and calculated the distribution of different viewer classes in a viewer group. And then next, we explore the correlation between user interests and video viewing patterns. 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 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.

3. Physical location of video viewing

In this module, we also analyze the geographical locations of users who view the same videos in

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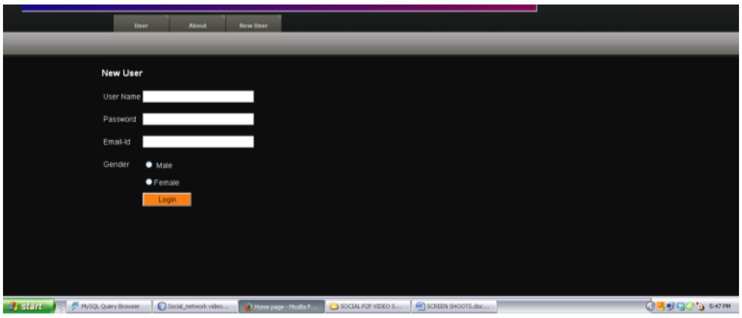
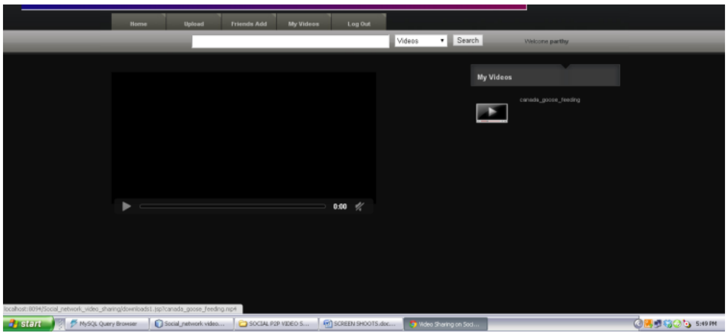
order to see whether location can also be leveraged for video sharing in OSNs. In Facebook, some users input their current resident city in their profiles. To investigate the location distribution of viewers, we calculated the percentage of viewers in each viewer group corresponding to different location distances between the viewer and video owner. We plot the average value of all viewer groups. We can see that most users watching the same video are physically close to each other. Because many friend relationships in Facebook are connected by offline relationship, such as classmates or colleagues, this produces a strong location clustering effect. This result conforms to the observation in that most of the wall posts are sent within local physical region. This effect could make P2P video sharing systems in OSNs more efficient by enabling geographically close nodes to share videos between each other.

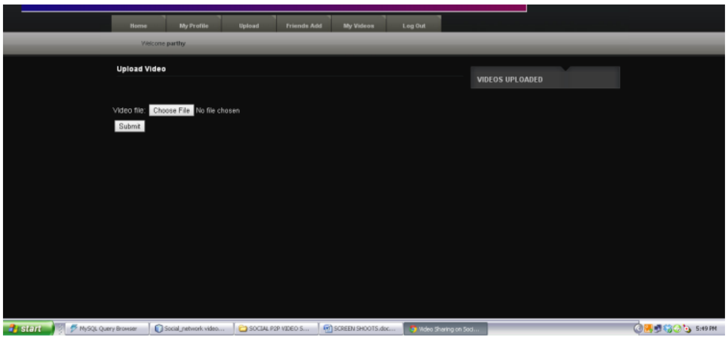
4. **Active life time of videos in OSN:**

In this module, we measured the percentage of views of a video in each month after the video is uploaded out of all views. We found that videos in Facebook have an active life period of about one month. Views in this period account for more than 90 percent of all views. After one month, there are only occasional views. The small figure inside more clearly shows the decreasing active life over days in the first month. We find that it follows a power-law distribution.

SAMPLE OUTPUT SCREENSHOTS







CONCLUSION

In this paper, 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, 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

SocialTube, which provides efficient P2P-assisted video sharing services. Extensive simulation results show that SocialTube can provide a low video startup delay and low server traffic demand.

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