Social Inclusion and Communications A Review of The Literature

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Abstract— The social interactions within the users who use such live streaming service needs to be spontaneous. The cloud computing technology has triggered enormous opportunities to facilitate the mobile live streaming of the multimedia contents with an extended support to interact with the users. The quality of service (QOS), storage and sharing are some of the issues that have to be addressed in order to provide a mobile social television in a cloud environment. The cloud technology effectively handles some of these issues by assigning proxies for the mobile users. These proxies (surrogates) for the users, operates on the base of trans-coding mechanism. Also the PAAS and IAAS cloud services are keys in providing such an effective interaction based live streaming.

Key words: Social TV, security, Quality Of Service(QOS)

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I. INTRODUCTION

Technology is changing television practices also, through integration of computing capabilities as in the case of digital video recorders such as TiVo1.Our Social TV project is about leveraging this kind of computing integration to remove the barriers to sociable interaction around video content. In focusing on the direct form of sociable viewing we will be talking about design for *distributed, shared* television viewing. While this necessarily changes the television experience, our concern is to preserve the 'natural', familiar social atmosphere of watching television in a collocated group. This goal of enhancing social opportunity while fitting existing practice frames the central design challenge.

In fact, television can even foster multiple forms of Sociability: direct (e.g. when chatting with friend sand family during a "movie night" at home) or indirect (e.g. when discussing previously viewed programs with colleagues at the office water cooler), and both are equally worthy of attention. There is, however, a lack of research on this Relationship between television and sociability, and in particular on the question of how to redesign viewing to support sociability among the viewers in light of the potential of emerging technologies. In this paper, we report on an investigation of this design question focused on the direct form of sociable television viewing.

Intermediary is the use of social TV and trans media. The intermediate strategy helps TV producers better know the needs of audiences through interaction. Then, the TV producers can create the content in which audiences are interested; and in turn, the interest in content drives the TV ratings and reputations. It seems like a virtuous circle for TV industry. The intermediate strategy has been recognized in industry. Take the recent successful cases for example, ESPN integrates Twitter, Face book, and YouTube with its NFL32 programming; Spike TV is powering a live feedback loop for Deadliest Warrior, in which the audience's interactions with the show's hosts will alter the show's outcome.

Social networks have their drawbacks. In the face of the specific security risks related to their normal usage (information disclosure and privacy issues), they have become an attack vector for phishers, fraudsters and sexual predators. Cyber criminals are adapting their strategies and tools to target social network users and are improving their attack technologies to target Web 2.0 applications. From the user perspective, trust and privacy on the social Web remains a hot, yet unresolved topic. As the web progress into the semantic web, there are more and more possibilities for security breaches as we introduce new technologies. Therefore, it is critical that security is considered right from the beginning of development of the semantic web.

II. ISSUES AND CHALLENGES IN USING SOCIAL MEDIA

The term social media (sometimes also referred to as Web 2.0) is an umbrella term used to describe a suite of tools. Most of these tools are typically free, simple to use and also support global collaboration. Social media tools are becoming very important because of the following reasons: To allow to seek input from customers on product, service To allow to get technology developments /updates To help to interact and develop new relationships with the customers, partners and suppliers To improve customer experience To accelerate problem solving To facilitate innovation through collaboration with third parties and industry experts To manage the brand and reputation Interact in new ways with their employees. Today, social-networking platforms like Face book, Twitter, LinkedIn, Blogs etc. need no introduction to employees in their day-to-day work. Social media tools are becoming very important because they help the IT organization and its workers to seek inputs, to interact, to develop new relationships, to improve experience, to accelerate problem solving, and innovations through collaboration. It is also important to note that the social media tools and the user community should be managed and regulated by the user community itself and not the provider of the tool or third party institution.Wiki's such as Wikipedia are systems for collaborative publishing. They allow many authors to contribute to an online document or discussion.

A. Web Services;

Web Services are software systems that make it easier for different systems, to communicate with another system in an automatic way to pass information or perform transactions.

B. Social Networking:

Refer to system, which allow members of a specific site to learn about skills, talents, knowledge or preferences. Some of the popular ones are FACEBOOK, LINKEDIN and

MySpace. This can be helpful to companies to identify experts.

C. Really Simple Syndication(RSS) :

This allows people to subscribe to online distributions of news, blogs, podcasts or other information.

D. Peer-to-peer networking:

Technique for efficiently sharing files (music, videos or text) either over the internet or intranet within a closed set of users. P2P distributes files across many Machines or retrieve files by gathering and assembling pieces of them from many machines.

E. Mash-ups:

These are aggregations of content from different online sources to create a new service. An example would be a program that pulls apartment listings from one site and displays them on a Google map to show where the apartments are located.

F. Collective Intelligence:

Collaborative publishing and common database for sharing

Knowledge is common ways to achieve this. The decisions,

can be made through collective information prior to making

III. SECURITY

Social media sites potentially increased security risks, and if a security breach arises from social media activities, the organization may face liability. Security breaches may occur because of malware download do not an organization's website through the use of social media.

This can happen when an employee downloads an application, or is a victim of "phishing" or "click-jacking"

20 on a social media site while using a company computer. If the organization's social media-related security policies, procedures, and technical safeguards are inadequate, It may be held liable for a breach arising from the surreptitiously acquired malware. In addition, social engineering within social media sites, as well as "spoofed".

Social media profiles or pages provide other points of entry for attackers and pose more legal risks for organizations. A spoofed site is one where criminals have set up profiles or fan pages to look exactly like an organization's own page. If a customer or employee is tricked into providing company

Information, personal information, or sensitive information (such as usernames and passwords), it could pose legal liability risks to the organization whose profile or fan page was spoofed, or replicated in a fake version .

The aim of this master thesis is to identify risks of a Social TV application and at the same time to derive requirements for an IT-security system to derogate these risks. Therefore habits and models of utilization of a Social TV application shall at first be deduced from the existing theoretical literature on media usage of TV and online communication. These will then be combined with theories on data security and privacy to further substantiate the resulting requirements. These are then to be tested and evaluated in a series of qualitative lab and field tests. It has to be mentioned at this point that this thesis does not aim at developing an exhaustive catalogue of requirements for Social TV security systems. But rather shall the requirements found here be useful to further develop Social TV prototypes, like the one used for the empirical analysis part of the paper. Completeness cannot be achieved in this context.

Since on the one hand the field of IT-security is moving and differing constantly and on the other hand so far no routines of usage could be developed for Social TV applications, since they have not been dispersed on the market yet. Such routines can however potentially also pose a threat to personal data security, and may create situations, which could not be expected beforehand. However this master thesis wants to hint at a possible direction for the further development of Social TV application and the threats connected to it.

A. RELATED WORKS:

Cloud is a general idea of integrating the multimedia services with the cloud technologies, which enables the user to access the multimedia content through the cloud computing technology. Providing multimedia service through the cloud technology faces the scalability, Qos and heterogeneity challenges[5].However the Content Delivery Network (CDN) and the peer to peer multimedia computing have been worked out to alleviate the problems in multimedia computing by pushing the multimedia content to the edges and to the peers respectively [5][6]. Rings et al has proposed the idea of integrating the cloud computing with the multimedia services without the Qos provisioning.

Whereas Zhu et al proposed the multimedia cloud computing which provides Qos provisioning. The working of the cloud services for the multimedia content can be differentiated and explained mainly by two ways, they are: multimedia-aware cloud and cloud aware multimedia. Here the former idea pertains to the quality of service(QOS) services for multimedia content and the later concept deals about how well the sharing, retrieval and storage of the multimedia content can utilize the cloud-computing resources for achieving a better Quality Of experience More finer framework like as Cloud Assisted Live Media Streaming have been studied to utilize the cloud resources by leasing and adjusting the cloud servers for the dynamic user demands.

Basically the video streaming using the cloud technology relies on the trans coding mechanism, which has two mapping options like Hallsh-based and Lateness-first Mapping for reducing the jitter in the trans coding .Also the Scalable Video Coding framework has also been proposed to reduce the latencies in the trans coding and to adapt to the dynamically changing network conditions. The works of Satyanarayanan have suggested the implementation of the dynamic virtual machine in carrying out the offloading to the mobile devices computations.The work of the proxy servers in the cloud technology for the multimedia or video streaming service has effectively handled the issue of the storage,processing challenges faced by some mobile devices in accessing those services have seen the idea of interactive live streaming through the cloud computing technology,which provides a co-viewing experience to the users with their friends in different geographic locations. Thereby making the activity more socialable. The social activities of a human while viewing

different video contents have been inspiring but still those frameworks cannot be applied in to the mobile environments directly.The design proposed by the Coppens et al have been intended to elaborate the social interactions but it got constrained with the broadcast program channels.Reflex is a mechanism to enhance spontaneity in the interaction between the users,which makes use of the Google App Engine to achieve more scalable and quality service in the social network,taking the large amount users into consideration.These interactions can be handled by the messenger service through the cloud computing technology.

IV. CLOUD-BASED INTERACTIVE STREAMING

The live video streaming has took a whole new dimension with the evolution of cloud computing technology. In the case of live video streaming, the cloud computing extends its support for interaction within the users and for a better quality of experience. The architecture workflow has been given as below in figure. The proxy servers or surrogates are assigned to each user who gets logged in to the cloud. These servers are provided by the Infrastructure as a service cloud. The surrogates will efficiently provide the offloading, it will be enacting as a middleware between the mobile devices and the video sources. It will be encapsulating the trans coding, segmentation and content adaptation operations. In addition to these operations the messenger, will also be handled by these surrogates, which is a key component in delivering effective interaction between the users.

The quality of experience for the users can be enhanced by the features like segmentation, zooming and content adaptations. The extensible messaging and presence protocol (XMPP), here plays a significant role in operating the transportation of the video segments and it is helpful in exchanging the metadata of these video streams like title, description.

A. Transcoding:

The surrogates assigned to the users, will be handling the transcoder, which decide the encoding format for the video stream dynamically. The bit rate and the dimension of the video stream will also be decided in this module. Since MPEG-4 has been the de-facto standard for the video delivery over lousy medium, this stream will be generally followed for the implementation. FFmpeg library is fundamentally utilized by this service for generating the thumbnails.

The transcoding frameworks splits the video contents into overlapping and non-overlapping group of pictures(GOP).These pictures may encircle different encoding qualities and resolutions, forming several layers.Such layers will be sliced as a coding-independent contents.Here 16x16 macro-blocks are framed for luma components and 8x8 MB is framed for chroma components.The granularity is decided with the parallelism in GOP level and MBs,which is divided into inter-parallelism and intra-parallelism.The simple diagramatic illustration in the fig [1] of the transcoding framework is given below will give a better understanding of the idea elloborated above.

1) Inter-node Parallelism:

The Inter-node parallelism manages the reduced picture nodes.The real-time transcoding is achieved through this inter-node parallelism,the transcoding jitter is an effect of the variatons in the time delay of the encoding of the GOP(Group Of Pictures). The encoding time is mainly estimated for the optimization problem .

(ii) Intra-node Parallelism:

The Intra-node parallelism manages the individual slice of the picture node. The Intra-node parallelism is very significant in the GOP encoding and it is vital in fixing the upper bound on the average computation time spent on the GOP encoding. Moreover this parallelism is not simply enough in reducing the access time

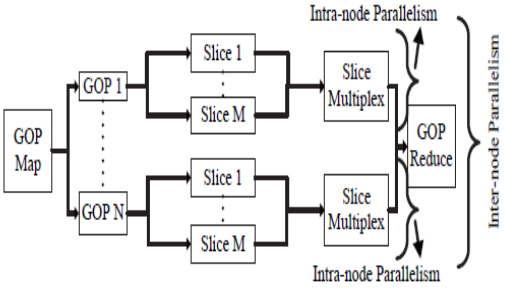

Fig. 1: Transcoding Framework

B. Segmentation:

The segmentation, is a feature to enhance the streamed videos, here this feature will create the list of points of scenes by identifying the scenes in the video. And by making use of the transcoding service the thumbnails for such segments will be created. Basically this feature is based on the OpenCV algorithms.

C. . Zooming:

This service will enable the users to zoom into the middle of the video stream. This will also be responsible in cropping of the streamed videos. This service fundamentally follows the object recognition service, which necessary in recognizing the objects in the video. The object recognizing service can enable to perform more complex zooming functionalities.

D. Messenger:

This service is responsible in delivering the asynchronous message to the user from the surrogates. User will make queries periodically to the social cloud through this service, which is in connection with the social cloud.This service is also responsible in processing the plain text data,which are in xml format.

E. Gateway:

The authentication of the users logged in are checked by this service,which also handles the logged in user list and maintains it in a separate database. The gateway is also responsible in reserving and destroying the surrogates based on the current work load.

F. Social Cloud Service:

The social cloud service will be maintaining the data stores like Big-Table in Google App Engine, for storing all the details regarding the user records, sessions and messages. A

data store interface is used to query and manipulate the Big-table which indeed a multi-dimensional maps, stores data object as an entity entitled with multiple properties. For the video streaming it fundamentally follows the RTP protocol. The XMPP handles the metadata of the video segments. The social cloud is basically extended by the PaaS services.

G. Architectural Framework:

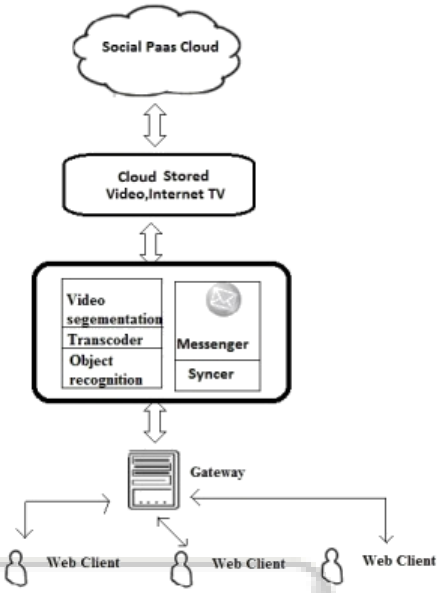

Fig. 2: Architectural Diagram

H. Synchronizer:

The synchronizer features the property of enabling the user to view the concerned video content in the same window as the other user in same session. This is achieved by retrieving current playback position and guides the user to adjust to that position. This is particularly concerned in providing the co-viewing experience to the users.

V. PERFORMANCE METRICS

In this proposed framework there are certain factors which affect its performance, where are here discussing some of the possible factors and the predicted performance improvements by this framework

A. Transcoding Latency:

The Transcoding latency can make an impact on the entire framework if had not handled carefully. Even with the modern day's multi core processors the process of encoding is highly complex in nature. The transcoding delay can cause the delay in the access of video content for the user and it could cause even the freezing of the particular video content.

B. Power Consumption:

The power consumption of the device, used for the access is significantly important, since that might well have a prime role in the working of this proposed framework in a considerable margin. The playback segment size of 10,which has been widely followed in streaming applications, was proposed by the Http Live Streaming protocol. However this segment has found to have drained the battery life significantly. Normally the power consumption factor is profiled by an Xcode tool called "Instruments".

C. Interaction Spontaneity:

In this proposed framework the spontaneity of the interaction between the connected users is measured by two levels of factors. The first is the latency in the sending of the message to the surrogates and the confirmation for the message being registered in the cloud. The other is the latency in query sent by the user to reach the assigned surrogates. Also the round-trip time between the surrogates and the GAE which also need to be taken into consideration for calculating the interaction latency in this framework.

VI. CONSEQUENCES FOR THE SOCIALTV USAGE AND DERIVATION OFREQUIEREMENTS FOR SUCH APPLICATIONS

As indicated above the theories on the usage of TV and internet shall serve as a basis to deviate theories about the usage situation of a Social TV application. Since this is not (yet) an established application in the household, conclusions about the usage – and in the end risks to data security resulting from this usage – have to be deduced theoretically. The usage situation of a Social TV application is expected to be coined concisely by routines. The regular patterns of the classic TV program offer a framework for periodic social interaction without any additional need for coordination of appointments. The social component of a Social TV application enhances the usage gratifications from the TV and differs the mixture of expectations raised by the technical device. The result of this is a shift of TV usage motifs towards more social tendencies. However this is not a surprising result with the social functionalities presenting the core asset of a Social TV application

VII. IMPROVEMENTS PREDICTED WITH THE FRAMEWORK

A. Efficiency:

To eliminate battery usage of the mobile devices this proposed architecture is aimed at providing an efficient burst transmission technique, which enables the mobile devices to operate on three states as High, Low and Intermediate. This technique fundamentally follows the Http Live streaming protocol, by which the video will be segmented by the surrogates and sent to the mobile devices on request. The mobile devices will be operating in High state when receiving the video segments and will be in Low state when remaining idle. The Intermediate state acts as the transition state between these two states.

B. User Experience:

Another important key aspect of this framework is the enhancement of the user experience by the features like zooming in and out the streamed video and the Scene by scene segmentation of the video stream. This enhancement is particularly achieved with the help of the XMPP protocol and RTP protocol which handles the video streaming, exchange of the metadata and video segments information. Here the metadata handler will be responsible in fetching the video segments and Playlist handler will be responsible in providing the preview thumbnails of the videos. The thumbnails, having a smaller resolution will get loaded very

fast. The object recognition service is a key part in providing the zooming feature on the streamed videos.

C. Spontaneous Interactivity:

Interaction is a key aspect of a social live streaming framework and this aspect is effectively handled in this proposed architecture by the means of the Messenger service, which being operated in a asynchronous way will provide spontaneous interactions between the connected users. A Big-table like data store will be made use to handle these data.

D. Scalability:

As this proposed framework takes the implementation phase, a challenge will be the ability of this entire system to handle the large amount users who gets too logged into the service (i.e.) the scalability measure of this framework. Being deployed on to the cloud network, it should effectively handle this problem as well but still this area has to be addressed in the future works.

VIII. REMARKS AND FUTURE WORKS

Our work has concerned primarily in suggesting a framework integrating the social interactive live streaming with the Quality enhanced user experience. The enhancement in the QoE of the user obviously shows great scope in the further feature enhancement with the streamed video contents, like as recording the live video contents to the device, noise removal and so on. On the other side the interactive aspect of the frame work has several areas to be more deeply addressed like applying memory cache support and more efficient transcoding mechanism.

IX. CONCLUSION

We conclude by proposing a framework for enriching the quality of experience to the users in an interactive live streaming, with the cloud computing as its backbone. And mobile users can import a live or on-demand video to watch from any video streaming site, invite their friends to watch the video concurrently, and chat with their friends while enjoying the video.

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