International Journal of Engineering Research & Technology (IJERT)
ISSN: 2278-0181
Vol. 2 Issue 3, March - 2013

Cloud Movie: Cloud Based Dynamic Resources Allocation And Parallel Execution On Vod Loading Virtualization

Akshatha K T [#1]
[#1] *M.Tech 4th sem (CSE), VTU*
East West Institute of Technology
India.

Prasad M R [*2]
[*2] *Assistant professor Department of CSE*
East West Institute of Technology
India.

Abstract

Cloud computing is the use of hardware and software resources that are delivered as a service over a network. Nowadays IP based video delivery has become more popular. A system through which, Internet Television services are delivered using the architecture and networking of internet protocol suite over a packet switched network infrastructure is called IPTV (Internet Protocol Television), which is a mean of transporting Audio/Video and Data Information across a digital IP based network. This could include Ethernet, LAN, Internet, or WAN. Audio and Video source can be streamed across existing networks to PC's or TV's with the addition of STB. IP based TV technology can be one too many (Multicast) or one to one (Unicast). Multicast streams offer the most efficient form of transmission as the bandwidth can be shared amongst all the users wishing to view the particular stream, if the channel is not being viewed no bandwidth is consumed. In this paper we seek to handle the ICC workload by using virtualized cloud computing infrastructure, to remove the queuing techniques and removing buffering technique and enhancing the QOS of a particular VoD file.

1. Introduction

With the recent advances in communication and computer technology [1], television has gone through many changes over the years. Nowadays IP based video delivery became more popular (IPTV). Internet protocol television is defined as a multimedia services such as television/video/audio/text/graphics/data delivered using the internet protocol suite over IP based networks managed to provide the required level of quality of service and experience, security, interactivity and reliability like- Internet, instead of being delivered through traditional satellite signal and cable TV formats [2].

IPTV services can be classified into three main groups a) Live Television: with or without interactivity related to the current TV show, b) Time shifted Television: catch up TV (replays a TV show that was broadcast hours or days ago), start–over TV (replays the current TV shows from its beginning) and c) Video-On-Demand (VoD): browse a catalog of videos, not related to TV programming.

In IPTV, Live TV is typically Multicast from servers using IP Multicast; with one group per TV channel, there are typically several hundred Channels.

The consumer's Set-Top Box "tunes" to a particular TV "channel" by joining the Multicast group for that channel [3]. Video-on- Demand (VoD) is also supported by the service provider, with each request being served by a server using a Unicast stream. When users change channels while watching live TV, we need to provide additional functionality to so that the channel change takes effect quickly. For each channel change, the user has to join the Multicast group associated with the channel, and wait for enough data to be buffered before the video is displayed; this can take some time. As a result, there have been many attempts to support Instant Channel Change by mitigating the user perceived channel switching latency [3]. With the typical ICC implemented on IPTV systems, the content is delivered at an accelerated rate using a Unicast stream from the server. The playout buffer is filled quickly, and thus keeps switching latency small. Once the playout buffer is filled up to the playout point, the Set-Top Box reverts back to receiving the Multicast stream.

In contrast, with traditional over-the-air broadcasting, or cable-based analog systems that do

not utilize a packetized video distribution, the Set-Top Box (STB) receives all the channels simultaneously. When the user changes channels, the STB immediately "tunes" to the new channel and begins displaying it on the screen. Hence the channel change time in such a system is minimal. But such systems are dramatically wasteful in the use of network resources [3].

1.1. Objective of the study

- The main objective is to support multiple services, without missing the deadline for any service.
- Save time by providing ICC workload by using virtual cloud infrastructure, removing queuing and buffering technique.
- Reducing money by cost optimization problem.
- Enable the required bandwidth to support a reliable IPTV Service delivered to the end user.
- Reduces the necessary bandwidth to transmit multimedia content.
- Allowing the media producers to safely distribute multimedia contents.

1.2. Scope

- The service providers can have more access options over which to deliver high bandwidth, high revenue IPTV and video services to subscribers, including previously expensive access technologies that are now available at comparable prices from multiple manufactures.
- VoD enables consumers to choose the content they want using an on-screen GUI menu and control the secessions by using Set-Top-Box functions like- Stop, Freeze, Fast forward and Rewind. The consumer can watch the video at any time with VoD, the consumer has complete control over the session.

2. System Analysis

2.1. Existing System

- In media streaming, the Internet's intrinsic heterogeneity continues a challenging problem. End users may have different edge bandwidth for data receiving or forwarding, especially in large-scale streaming with hundreds of thousands of users.
- Description coding rates have straightforward impact to the delivery performance. If a description has a high coding rate, some network paths may not have enough bandwidth to support its delivery.
- The loss rate of the description will be high. On the other hand, if descriptions have low coding rates, the number of descriptions and accordingly the coding cost will be high.
- There are mainly three threads of related work, namely cloud computing, scheduling with deadline constraints [4], and optimization.
- Cloud computing has recently changed the landscape of Internet based computing, whereby a shared pool of configurable computing resources (networks, servers, storage) can be rapidly provisioned and released to support multiple services within the same infrastructure .
- Due to its nature of serving computationally intensive applications, cloud infrastructure is particularly suitable for content delivery applications.
- Typically Live TV and VoD services are operated using dedicated servers, while this paper considers the option of operating multiple services by careful rebalancing of resources in real time within the same cloud infrastructure.

2.2. Proposed System

- We represent a Server as a Service Provider, called the VoD Server, fed by multimedia Resources and handling the request that is incoming from the Remote User in which IPTV is constructed as described in a local media player.
- As the multimedia file is divided into 'N' Number of packets from each sub-stream arrive at the VoD Server, they are stored in the Cloud for reassembly to reconstruct the full stream to the remote user.
- Portions of the stream that have been reconstructed from the VoD Server are then played back to the user as IPTV Services. In addition to providing a reassembly area, the VoD Server also enhances the user to absorb some variability's in available network bandwidth and network delay (VoD Server will enhance the Bandwidth as per the multimedia file request).
- This System provides a generalized framework for computing the amount of resources needed to support multiple services, without missing the deadline for any service.
- This System implements a simple mechanism for time-shifting scheduled jobs in a Real Time VoD Server and study the reduction in server load using real traces from an operational IPTV network.

2.3. System Specification

It specifies the hardware and software requirements that are required in order to run the application properly. The Software Requirement Specification (SRS) is explained in detail, which includes overview of this dissertation as well as the functional and non-functional requirement of this dissertation.

Table: 2.1 Summaries of SRS

Functional	Control the file access at cloud server, Data Integrity Proof at TPA. Multimedia File Management
Non- Functional	Cloud servers never monitors and controls the TPA, Remote user never uploads the file
External interface	LAN , Routers
Performance	Maintaining the multimedia File Access between the remote user and the cloud server, Finds the hackers in the cloud
Attributes	Multimedia File Management, IPTV Services, Maintain VoD Servers, multimedia File Virtualization

Functional Requirement defines a function of a software system and how the system must behave when presented with specific inputs or conditions. These may include calculations, data manipulation and processing and other specific functionality. In this system following are the functional requirements:-

- The Owner will upload the multimedia Files To the cloud servers.
- The Cloud server has to authorize the valid Remote users. If the Remote user is hacker and doesn't have the account then he has to block in the cloud server. The Third party auditor has to maintain the data integrity and has to monitor the Cloud Server multimedia File Transaction.
- The Remote user has to create the account in the cloud server and has to pay the amount to download the multimedia files and use the IPTV Services through Virtualization.
- TPA has to maintain the IPTV multimedia File transactions and finds the hackers in the cloud server and provides the public auditing from the data owner.
- The Attributes are multimedia File Management, TPA, cloud server, owner, Remote user and blocked user.

Non Functional Requirements / Qualities of a System.NFR are a requirement that specifies the operation of a system, rather than behavior.

- Security : Cloud Server doesn't provide unauthorized access
- Audit & Control: TPA monitors and controls the Cloud Server.
- Integrity: VoD Server stores the contents, multimedia files and allows data Integrity.

2.4. System Modules

This contains four modules

- Data Owner module,
- VoD server module,
- TPA server module and
- Remote user module.

2.5. System Architecture

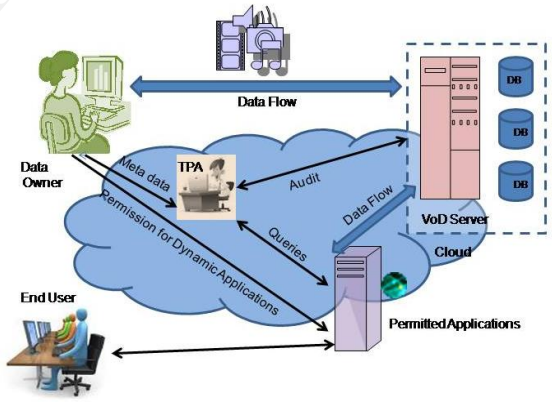

Figure 2.1 Architecture Diagram

3. Module description

- Data Owner, the Remote users who have data to be stored in the cloud and rely on the cloud for data computation, consists of both individual consumers and organizations.
- VoD Server contains news, films, sports, other video clips which can be rendered on demand on most Web media outlets. The VoD Server contains the following information.

- Client/Server, the video content is stored at the server. Each client connects to the server and plays the requested video from the server, independently from other clients' transactions. The server workload may be heavy if there are many client requests. Proxy servers can be deployed to reduce this load. Alternatively, clients requesting the same video can be grouped into a single multicast sent by the server. The Client/Server approach is used in most commercial VoD products nowadays because of its simplicity and central management.
- Remote User, The remote user requests the multimedia file to the VoD server. Based on the multimedia File the VoD Server sends the corresponding file to the Remote User. Before this process, the User authorization step is involved. In the VoD server side, it checks the User's multimedia File and its corresponding secret key for security process. If it is satisfied and then the file will send to the remote user. Or else the remote user detects as a file hacker in the VoD server. Remote User Accounts, The user those who want to stream Live TV from the VoD server needs the account. Then the user will pay the bill online to get the IPTV services through virtualization. The remote user will be considering as a resource hacker if they don't have account with the VoD server.
- TPA The main role of the TPA server is to enhance data integrity on the files being stored on to the cloud server. Audit and control the information.

4. System Implementation

4.1. Basic Theory

The data owner is to store or upload the files on the cloud or VoD server. As a first step for enhancing security the data owner goes for encrypting the file that is needed to be stored on VoD server after encryption Data Owner goes for generating Metadata. Upload the generated Meta data to TPA to enhance the security. The VoD server is to provide a space for the data owner to store the files and provides service to the requesting clients and generates a hacker's alert to the mobile. TPA server enhance data integrity on the files being stored on to the cloud server, and remote user access the information from cloud server weather he may be a valid user or a hacker.

4.2. Implementation Algorithm

- VoD Cost Optimization, The main objective of Cost Optimization is the creation of a unified and efficient structure of Accessing multimedia Resources from VoD Server and getting the IPTV Services through virtualization. Cost Management and Optimization has always been acknowledged as a way to increase profitability between the VoD Server and the Remote users for getting IPTV Services [5]. Yet, the efficiency and the coherence of cost management techniques and approaches are not easily ensured in a constantly evolving economic and financial environment for getting Live TV from the VoD Server.
- RSA Algorithm for Public Key
  RSA key generation by using key pair generator instant method, convert the RSA key into encoder format using by Cypher class. Generate key pair for public and private key and convert the public and private key in terms of bytes which is in the encoded format.
- Randomized Key Generation Algorithm
  Key generation is the process of generating keys for cryptography. A key is used to encrypt and decrypt whatever data is being encrypted or decrypted.

5. Conclusion

IPTV is ready for prime time. Telecommunication is at the confluence of technical and market forces. The technology of most IPTV components is mature and the cost of equipment is far more reasonable than it was ten years ago. IPTV allows the service provider to deliver only those channels that the consumer wants at any given time- Unlike traditional television broadcasting, where every channel is delivered to every home on the network. Video delivered over IP networks in all of its flavors is a huge opportunity as well as a challenge facing telecom service providers. The "personal cast" method of delivery means reduced opportunities for theft of content.

Here we learn how to lower a provider's costs of real time IPTV services through a virtualization IPTV Architecture and through intelligent time shifting of services delivery.

Traditional ICC techniques reduce latency by having a separate unicast channel for each and every user changing channels. In order to lower bandwidth consumption, display latency, variability of network and server load. Moving forward for another approach called Multicasting based approach. Due to the jitter arising from protocols that have to recover from packet loss and the possible delay variation in the IP network there is a need to have a playout buffer at the receiver (STB) to prevent

underflows. The STB receives all the channels, the STB immediately "tunes" to the new channel and begins displaying it on the screen.

6. Future Work

Here we observed the different forms of cost functions and solved for the reduction in number of servers which are required to support these services without missing any deadlines. Mechanisms to predict the relative load of each service can yield further improvements.

Designing such mechanisms, generating the node details in handheld mobile devices and applying the ECC Cryptography for enhancing the security on the multimedia files is an opportunity for interesting future work.

7. References

[1] A. Dan, D. Sitaram, and P. Shahabuddin, "Scheduling Policies for an On-Demand Video Server with Batching," in *Proc. of ACM Multimedia*, San Francisco, CA, October 1994, pp. 15–23.

[2] IPTV, Wikipedia (URL:http://en.wikipedia.org/wiki/IPTV)

[3] D. Banodkar, K. K. Ramakrishnan, S. Kalyanaraman, A. Gerber, and O. Spatscheck, "Multicast instant channel change in IPTV system," in *Proceedings of IEEE COMSWARE*, January 2008.

[4] J. A. Stankovic, M. Spuri, K. Ramamritham, and G. C. Buttazzo, *Deadline Scheduling for Real-Time Systems: Edf and Related Algorithms*. Norwell, MA, USA: Kluwer Academic Publishers, 1998.

[5] D. P. Bertsekas, "Dynamic Programming and Optimal Control," in *Athena Scientific, Blemont, Massachusetts*, 2007.