Peer-to-Peer IPTV System over the Internet (TD1a-08)

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Introduction

Internet Protocol Television (IPTV) is a system where a digital television service is delivered using Internet Protocol over a network infrastructure, which may include delivery by a broadband connection, and all the contents are received through computer networks. IPTV is often provided in conjunction with Video on Demand, but requires real time data transmission, which is sensitive to packet loss and delays if the bandwidth is not wide enough. Hence, according to the requirements of IPTV and the advantages of P2P technology, P2P IPTV model become a solution to people.

This project aims to implement an IPTV system based on P2P technology by using Microsoft C++, which enables multiple users to watch live multimedia videos synchronously through the Internet. As a result, all the peers can play the video even the bandwidth of the server side is limited. Meanwhile, with more and more users connected to the system, the overall performance of the system can be more stable and smooth.

Methodology

Server side:

- Peer manager
  - Function: 1. Handle the request from the clients
  - 2. Track and save the peer information

- Data handler
  - Function: 1. Create header file for media streaming
  - 2. Pass it to buffer, waiting for transmission

Client side:

Peer manager and Data handler have similar function as the server's, the only difference is that the data handler in the client side is responsible for decoding the data, by using VLC, and pass it to the virtual server. Virtual server is responsible for reorder the video segments so that the final complete file can be played by media player.

Result

The MFC client/server file transfer system and the VLC are the major components in the whole system. The VLC acted as a streaming server as well as media player at the client side, while MFC client/server file transfer system perform the network protocol part, which ensure the stable and accurate transmission.

MFC client/server file transfer system user interface:

VLC create the header file in the server side and send it to the client by using MFC client/server file transfer system for media streaming.

Complete procedure for running the system:

1. The client subscribe the channel, and the server create a particular header file according to client’s IP address.
2. The client downloads the header file by using the MFC client/server file transfer system. By using VLC, the client can play the media stream with the header.