The design and implementation of TV live broadcast and replay recording system

In recent years, with the popularity of the Internet and the development of streaming media technology, network television has become a new Internet culture. Watching live TV programs on the Internet, and watching the recorded programs and video files become an increasingly strong. Based on years of accumulated experience in technology and product development, National data broadcasting Research Center actively participate in Nansha Reef IPTV System. This paper designs and implements the TV program live and The replay recording system in Nansha Reef IPTV System.

Firstly, this paper introduces RTMP protocol, HLS protocol, TS format and FFmpeg open source program, of the streaming media technology, and compares the advantages and disadvantages of the two protocols.

In order to meet the LAN users’ demand of using the Internet to watch live TV programs and replay the corresponding TV show, this paper uses the Linux system to build up the Streaming media live server and replay recording system, which is based on the HLS protocol and RTMP protocol. The specific steps are as follows:1) Compile and deploy a simple and reliable streaming server over the Linux system. make it possible to change the television program signal into a streaming media for network users to watch. 2)Using Python language to achieve a set of replay recording system, which is based on EPG TV live broadcast source recorded into a video file and stored in the local HTTP server for the client to watch.

For the client, this paper realized multiplatform client player. These platforms include Windows/Linux PC machine, iOS/Android phone, a variety of Android boxes. To ensure the compatibility of the player, this paper Use FFmpeg for video decoding and playback on Android platform.

The RTMP protocol has small delay and weak compatibility, while the HLS protocol has large delay and good compatibility. This paper selects the RTMP protocol for PC side to play and the HLS protocol for mobile to play. And choose the scheme of using UDP to transmit TS stream for replay recording system.

TV program live and The replay recording system built in this paper is already applied in optical network system of Nansha Reef IPTV System and the laboratory of Engineering center support unit. After more than a month of testing and improvement, the system runs stably and achieves the expected goal. Furthermore, comparing with the existing recording program, the replay recording system improves the efficiency of program operation greatly.