**Peer-to-Peer Video-on-Demand System Over the Internet**

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**Abstract**

In recent years, internet video applications, such as video communication and video on demand, have become highly demanded. As video streaming occupies a large fraction of internet traffic, it is necessary to find proper approaches to deliver video content to a large amount of clients. With the development of distributed computing, peer-to-peer [P2P] based video on demand (VoD) systems have been widely employed to meet the increasing demand.

This project aims to develop a peer-to-peer system, which supports the video on demand services, it allows peers to watch videos with small delay. Moreover, with the P2P structure, the network could achieve a sustainable decentralization. Thus, the combination of VoD media server and P2P network is the core of this project.

**System Overview**

This system consists of three functional parts, which are server, bootstrap nodes and clients.

**System Components**

**Server Side**

- VLC Central Streaming Block: Where a new bootstrap node joins the network, it will use VLC centralized video to receive media files from the bootstrap node assigned.
- Client Communication Block: It will collect clients’ information and send program information and bootstrap information to them.
- Bootstrap Communication Block: It will communicate with bootstrap node to record its detailed information, such as IP address and port number. It will also deliver the mapping between bootstrap node and program information.

**Bootstrap Nodes**

- Server Communication Block: It collects media information and peer information from server side and report server the client’s information.
- Client Communication Block: It will maintain the clients’ information, so that to construct the network.
- P2P Communication Block: It will distribute and receive TCP packets within the subnet.

**Conclusion**

This peer-to-peer architecture and video on demand service have been studied. VLC player has been employed as the streaming tool. The peer-to-peer architecture has been actualized by PeerTo overlay in each subnet. Each subnet can support a large number of viewers watching at the same time. The video-on-demand service is implemented by the hybrid structure, which dramatically reduces the workload of system server side. Various coding schemes are supported by this system.