ABSTRACT

This research work concentrates on the development of new Distributed VoD architectures, development of efficient resource management strategies for these architectures. The agent technology is used in this research work to support the resource management methodologies.

Chapter one presents an introduction to multimedia applications and in particular Video on Demand. The needs and the present challenges in Video on Demand systems are introduced. The functionalities, properties and advantages of agents are discussed. The motivation, objective of this research work and the problem statement are presented.

Chapter two presents the literature review related to the research work. A survey on the bandwidth and channel management approaches investigated by researchers is discussed. A detailed study on the buffer management approaches presented in different papers is made. The related work in the area of VoD architectures is presented and discussed. A review of the agent technology, their advantages, adaptability and their usage in the VoD systems is also discussed.

Chapter three presents the system architecture of a VoD system. The concept of centralized VoD and Distributed VoD is introduced. The VoD system network for the communication between the clients and the server along with a storage hierarchy is presented. The components of the user set-up box are discussed. Some of the techniques developed to enhance the performance of the VoD server like admission control, disk striping, data replication, data blocking and rearrangement etc are presented. A brief summary on several efficiency improving systems like batching, patching, piggybacking, periodic broadcasting and internal caching is given. Some of the batching techniques like FCFS, MQL, MFQL, IML, IMQ and GGSC are introduced. Some of the periodic broadcasting techniques like staggered broadcasting, harmonic broadcasting, fast broadcasting, pagoda broadcasting, pyramid broadcasting, permutation-based broadcasting and skyscraper broadcasting are briefly discussed.

Chapter four introduces the proposed architectures, Video Caching Brother Network [VCBN] VoD architecture, Proxy Server Group [PSG] VoD architecture and the Tracker based VoD architecture. Dynamic bandwidth management and algorithms are proposed for the VCBN VoD architecture and the Tracker based VoD architecture. Dynamic buffer management algorithms are proposed for the VCBN VoD architecture and the Tracker based VoD architecture.
Chapter five proposes agent architecture for the proposed VoD architectures. The channel management algorithms for the traditional Distributed VoD architecture, the proposed VCBN VoD architecture and the PSG VoD architecture are presented.

Chapter six discusses the results of the algorithms presented in chapter four and chapter five.

Chapter seven presents a conclusion summary and discusses the scope for further research work.

Finally, a list of references and a list of publications made are presented.