CHAPTER 7

CONCLUSION AND FUTURE ENHANCEMENTS

7.1 CONCLUSION

The objective of the proposed proxy caching system is to maximize the number of clients that can be simultaneously supported, minimize the startup latency and to provide a smooth display of objects without any disruption or jitter. In order to meet the above QoS requirements of the user a multimedia framework with three new caching schemes have been proposed in this thesis. The proposed methods had been designed to reduce the user latency and to increase the cache benefit in terms of the byte hit ratio. Also the network bandwidth usage is reduced with the availability of data in the cache. The first two methods support the interactive VCR functionalities by caching the interleaved portion of the objects.

The proposed fragment level caching system divides the object into fragments where the individual caching entity is a block within a fragment. The system supports the interactive VCR functionalities of the user. A new decision parameter called ATPR (Average Arrival Time to APR ratio) has been proposed to improve the cache space management for multimedia objects.

The system had been analyzed in terms of the standard evaluation factors namely the BHR and DS. The optimal weightage for the AAT and APR of the requested object had been found to be 40:60. The proposed system performs better in terms of the BHR by an average of 10% and in
terms of the delayed starts by an average of 3% when compared to the existing system.

The proposed metafile-order caching system tries to reduce the required bandwidth and buffer size of the client by caching the object at the frame level. This scheme is suitable when the user’s seek mode is of random access in nature thus supporting the interactive VCR functionalities. The caching decision had been based on the metafile-order of objects.

The proposed metafile-order caching scheme showed an improvement of 3% in terms of the normalized beneficial value. The proposed scheme outperformed the existing caching schemes by a maximum of 11% in terms of the BHR. It was also found that there is an increase in the BHR with respect to individual object by a minimum of 2%.

The proposed Modified-MPR caching scheme is used to cache individual versions of the objects. The versions from low priority set had been also considered for caching. Dynamic transcoding decision had been taken while fetching the required version to reduce the user latency.

The proposed scheme had been analyzed in terms of the evaluation factors namely EHR, BHR and CDR. The proposed method outperformed the existing scheme by 2% in terms of EHR for different skewness and diversity values. The proposed scheme showed an improvement of 2% in terms of BHR when the NCS versions had been cached. While analyzing the system in terms of reduction in CDR, it had been found that the proposed method outperforms the existing scheme by 4%.
7.1.1 Comparative Analysis Of The Proposed Caching Schemes

The three proposed schemes in this proxy caching architecture had been compared in terms of the independent evaluation factor namely the Byte Hit Ratio (BHR). The first proposed method namely the fragment-based caching scheme produced on an average an improvement of 17% in terms of BHR when compared to the existing fragmental caching schemes. The second proposed method namely the metafile-order caching scheme showed an improvement of 12% as average when compared to the existing scalable caching schemes. The third proposed method namely the Modified-MPR caching scheme gave an improvement of 5% as an average when compared to the existing version based caching schemes. The performance improvement of the individual proposed schemes in terms of BHR is given in Figure 7.1.

![Average Percentage of Improvement in BHR](image)

**Figure 7.1 Improvement In BHR Of The Proposed Schemes**

7.2 FUTURE ENHANCEMENTS

Following are the observations that can be considered as the future enhancements to improve the system further:
• The frame-wise caching can be modified to a higher granularity entity so that the computation time needed for making the caching decision can be reduced.

• The version of the objects can be cached at segment level with interleaved storage to enable the interactive user access.

• The system can be extended to the multiple proxy environment to improve the user QoS by improving the availability of the service.