Chapter 8

CONCLUSION AND FUTURE RESEARCH

In this thesis, we had investigated extensively and explored all the possible justifications for the optimal multi facets approach for peer to peer video on demand system.

We have first proposed revived p2pVoD architecture to improve the overall performance ratings of the p2pVoD system. We have projected a panoramic view of the architectural framework and categorized it into two different activity zones. For the sake of simplicity, the centralized zone was modelled based on the server farm, and the centrical zone was modelled based on the peer to peer cooperative network. The problem herein was to supplement the peer as a miniature server. Hereby, we have successfully achieved the objective of resuscitation of the archaic p2pVoD architectural design without having any new additional or modification or upgrading the existential infrastructure. By utilizing the idle peer resources, actually it decreases the abasement of the global resource utilization. Thereby, it also unifies the social cause and effect under this proposed p2pVoD architecture. The future work of our p2pVoD architecture is to advocate the support for the multimedia enabled electronic gadgets. The predicted gadgets are smart phone, mobile laptop, personal digital assistant, tablet computer, coffee table computer, and innovative mobile phone wrist watches.

Initially, we have created a deterministic video chapter file for the video data files, which are stored in the streaming server. The objective herein was to reduce the average seeking time for the VCR operations. This was achieved by introducing a key-frame search mechanism, so that the video blocks are reached on time. We have successfully implemented a framework using Markov Chain Monte Carlo method for the creation of the video chapter file. Wherein, the framework includes our proposed M-Segmentation technique. The performance of the M-Segmentation technique has excelled comparatively higher than the temporal, manifold, spectral, and dual precision segmentation techniques. The incitation of the quicker VCR operations for the users actually diminishes the reneging patterns completely. The future work of the M-Segmentation technique is to further refine the granularity of identifying the scene boundary locations into shot boundary locations.
Consequently, a novel dynamic pricing scheme was proposed for the selection process of contributing peers. The objective herein was to maximize the profit generation for the contributing peers, which was successfully done by the resource usage measurements. We have devised an efficient dynamic pricing algorithm, which optimally calculates the utilization factor. The outcome of the optimality brings out the optimal quantity of the video blocks that are required to store in the contributing peers’ chaining buffer. Also, the optimality proponents the utilization factor under a highly stochastic demanding environment. Thereon, the performance evaluation result shows that our proposed dynamic pricing scheme generates more profits than the altruism, cost model, and game theory perspective pricing schemes. Thereby, we have successfully achieved the objective of maximizing the generation of profits for the contributing peers. The future work of our dynamic pricing scheme is to further speculate on the incorporation of game theory perspective to earn more possible amount of profits.

One of the major concerns of the p2pVoD system for the content owners was the susceptibility of the movies to piracies. By intellection, the contents of the video can be easily copied and redistributed without any restrictions. Hence, we had proposed a modified Balanced Incomplete Block Design for the construction of video fingerprint-IDS. Therefore, the procedures for the construction of the video fingerprint-IDS and the embedding technique were apprehensible in depth. Thereon, we have derived the formulae for the efficiency, effectivity, and performance. The efficiency, effectivity, and performance test proved that our MC-BIBD was better in identifying the traitors than the MR-BIBD, GO-BIBD, TC-BIBD, and GD-BIBD block designs. Thereby, we have successfully achieved the objective of implementing an indispensable video fingerprint mechanism. But, the videos are not completely protected because the video contents are not encrypted. As a case of further reinvestigation, this will be taken as the future work, wherein elliptic curve cryptography will be promoted thereon to encrypt the contents of the video.

The quality of service in our p2pVoD system is the collective performances of the contributing peers’ services. For ensuring the higher level of QoS for the peers, we have considered two important parameters, namely, streaming server bandwidth and peers’ chaining buffer. The objective herein was to minimize the utilization of streaming server’s bandwidth by maximizing the utilization of peers’ buffer. Thereby, we have proposed M-Chaining technique, wherein the peers’ buffer is utilized to its
maxima and the streaming server’s bandwidth was preserved to its maxima. This was successfully achieved by implementing a dispersion algorithm in our M-Chaining technique, which ensured the higher level of QoS. The result of M-Chaining technique facilitated more number of peers than the basic, extended, adaptive, and optimal chaining techniques. The future work of the M-Chaining technique is to extend the chaining capabilities to other kinds of multimedia enabled electronic gadgets.

As the scope and scale of p2pVoD system continues to grow, it is important to develop a comprehensive design principle for the state of reliability. Hence, we have proposed a new replication technique called as M-Replication. Herewith, we have ensured that the reliable state of the movie is maintained during individual or multiple failures of the peers. The achievement of the long-term availability of the movies in the video chain was done through M-Replication technique. Wherein, this technique creates the functional replicas along the ongoing video chaining session and the non-functional replicas around the auxiliary video chaining session. The result shown was that the peers using M-Replication were virtuously utilizing the bandwidth, which was inversely proportional to the bandwidth utilization at the streaming server. It was also shown that M-Replication technique efficiently utilized the chaining buffer space than the dynamic, square-root, proactive, and optimal replication techniques. The future work of the M-Replication is to further place the non-functional in an inter-clustered cooperation.

In conclusion, we have successfully streamlined the smoother playback of the video blocks by using a simplistic unicast transmission mechanism. In the environment of dynamics and uncertainties, the users’ quality of viewership is greatly increased. We have also successfully achieved the objective of virtually reordering of the streaming channels through practicable case studies.