EFFICIENT SEGMENT–BASED VIDEO TRANSCODING PROXY FOR MOBILE MULTIMEDIA SERVICES (ThuPmOR3)

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Abstract :
To support various bandwidth requirements for mobile multimedia services for future heterogeneous mobile environments, a transcoding video proxy is usually necessary to provide adapting video streams to mobile clients by not only transcoding videos to meet different needs on demand, but caching them for later use. Traditional proxy technology is not applicable to a video proxy because it is less cost–effective to cache the whole video objects to fit all kind of clients in the proxy server. Since transcoded video objects have inheritance dependency between different quality versions, we can use this property to trade off the transcoding overhead with caching of transcoded objects. The issue becomes a study of decision policy whether or not a requested video object is transcoded from an existing version or directly cached for later use. We propose an object relation graph (ORG) to manage the relationships between video versions, and utilizes a cached object relation tree (CORT) to manage video segments cached in the proxy. Experimental results show that the proposed algorithm significantly outperforms companion schemes in terms of the cache hit ratios and retransmission ratios.