Performance comparison of cache replacement algorithms onvarious internet traffic

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Abstract	Internet users tend to skip and look for alternative websites if they have slow response times. For cloud network managers, implementing a caching strategy on the edge network can help lighten the workload of databases and application servers. The caching strategy is carried out by storing frequently accessed data objects in cache memory. Through this strategy, the speed of access to the same data becomes faster. Cache replacement is the main mechanism of the caching strategy. There are seven cache replacement algorithms with good performance that can be used, namely LRU, LFU, LFUDA, GDS, GDSF, SIZE, and FIFO. The algorithm is developed uniquely according to the internet traffic patterns encountered. Therefore, a particular cache replacement algorithm cannot be superior to other algorithms. This paper presents a performance comparison simulation of the seven cache replacement algorithms on various internet traffic extracted from the public IRcache dataset. The results of this study indicate that the hit ratio performance is strongly influenced by cache size, cacheable and unique requests. The smaller the unique request that occurs, the greater the hit ratio performance obtained. The LRU algorithm shows an excellent hit ratio performance to perform cache replacement work under normal internet conditions. However, when the access impulse phenomenon occurs, the GDSF algorithm is superior in obtaining hit ratios with limited cache memory capacity. The simulation results show that GDSF reaches a 50.75% hit ratio while LRU is only 49.17% when access anomalies occur.
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