

ABSTRACT

Edge computing, as a new computing paradigm, brings cloud computing and storage capacities to network edge for providing low latency services for users. The networked edge servers in a specific area constitute edge storage systems (ESSs), where popular data can be stored to serve the users in the area. The novel ESSs raise many new opportunities as well as unprecedented challenges. Files can also be dynamically created, deleted, and appended. This results in load imbalance in a distributed file system (i.e., the file chunks are not distributed as uniformly as possible among the nodes). Emerging distributed file systems in production systems strongly depend on a central node for chunk reallocation and data security. This dependence is clearly inadequate in a large-scale, failure-prone environment because the central load balancer is put under considerable workload that is linearly scaled with the system size, and may thus become the performance bottleneck and the single point of failure. In this project, a fully distributed load rebalancing algorithm using AES-Hash functions are presented to cope with the load imbalance problem and to access data and information. This proposed work is compared against a centralized approach in a production system and a competing distributed solution presented in the literature. The simulation results are comparable with the existing centralized approach and considerably out performs the prior distributed algorithm in terms of load imbalance factor, movement cost, and algorithmic overhead.

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