Research on Key Technologies of Edge Cache in Virtual Data Space across WAN

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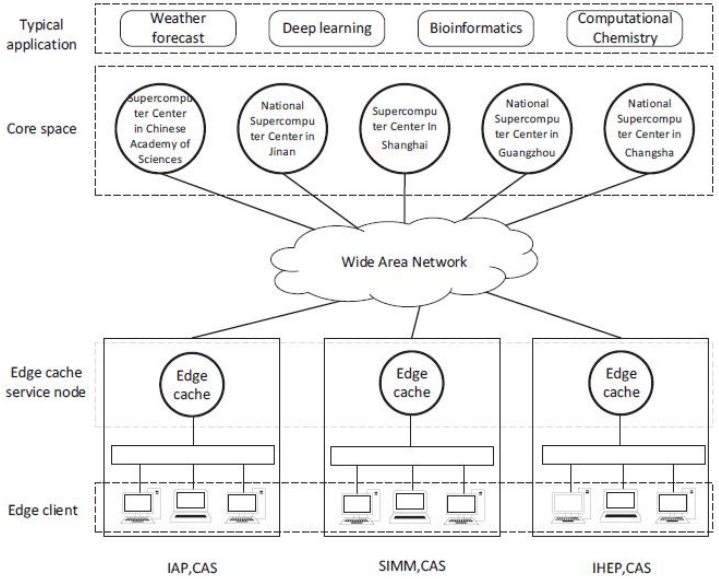
Problems & Ideas

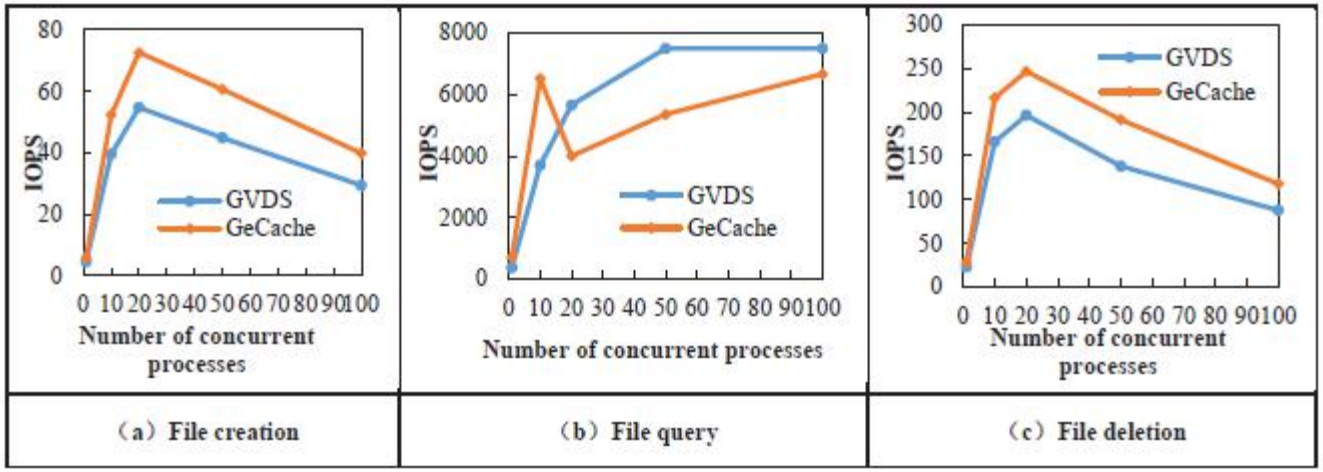
- Problems of GVDS accessing and sharing remote data.:
  - when accessing and sharing remote data in the WAN, the GVDS will cause redundant transmission of data and waste a lot of network bandwidth resources.
- Ideas: The edge cache system as a supplementary system of the GVDS can improve the performance of upper-level applications accessing and sharing remote data.



The edge cache system is a supplement to the GVDS, which mainly includes the edge client and the edge service node. The edge client is at the edge of the network and loads the edge client module, which can sense the existence of the edge cache system. The edge service node is the main component of the edge cache system, and multiple service nodes can form an edge cache cluster to provide services to edge clients.

Main Contributions

- Contributions:
  - The edge cache system uses a two-tier index to index and cache files. The metadata of the edge cache system is stored in the distributed Key-Value database system for persistent preservation;
  - The edge cache replacement strategy based on the cost/value model is proposed to improve cache performance;
  - A edge cache cluster scheme is proposed to improve the service capabilities of the edge cache system.



Metadata access performance comparison between GVDS and GeCache (proposed in this paper) in the case of multi-process concurrency.