Abstract: Client-side data caching plays an important role of enhancing data availability and improving the query response time in wireless and mobile environments. In this presentation, we present CS Cache Engine suitable for Location-Based Services, one of the killer applications for mobile and pervasive computing environments. The CS Cache Engine implements Complementary Space Caching model that preserves a global view of the database by capturing those objects not in the cache but in the server as Complementary Region (CRs) in addition to cached data objects in the cache. With the CS Cache Engine implementing CS caching, various kinds of location-based queries can be supported and client assertiveness on their own answered queries is enhanced, greatly reducing unnecessary requests over the wireless channel.

Constraints of mobile environment:
- Limited bandwidth and weak connectivity, and
- Short battery life

Our solution – Complementary Space (CS) Caching (at client):
- Support multiple kinds of location-dependent queries
- Maximize the cache answerability

System Architecture

Client/Server Model:
- Server: Query Processor, R-tree, and Spatial Database
- Client: Query Processor, Cache Manager, and Cache Table

System Prototype

TouristGuide
- Searching facilities in New York City

Reference


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