Project Overview

Objective is to analyze which co-operative caching algorithm works well with pre-fetching

- In distributed networks, collaborative or co-operative caching between clients helps in mobility and caching more blocks.
- Prefetching is the process of loading the client cache with the memory block ahead of time to reduce latency.

Co-Operative Caching Algorithm

- In co-operative caching system, a client uses its peer’s cache as an extension of its own.
- A single copy cached block or singlet is handled differently in each algorithm.

Evaluation Metrics

Evaluation to prove pre-fetching works:

- Local, Global and Server Cache Hits for client requests
- Cumulative Tick costs for client requests

Pre-fetching Algorithm

To prefetch blocks we have two approaches:

- Prefetch those blocks that are frequently requested but due to the volume of request it is replaced.
- Prefetch blocks which are frequently missed in the client.

Results

- Cache Hit Rates for all algorithms improved with 12% margin using prefetching
- Prefetching works better with Greedy algorithms and has very moderate effect on n-Chance and Robinhood algorithms.
- Tick Cost have reduced with prefetching.

References

- Steven Wardwell and Dr. Hans-Peter Bischof. Distributed collaborative caching. Proceedings of The 2016 International Conference, July 2016.