## Caching Strategies for DBS-based Internet

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### Project background and goals

- **Architecture:** DBS-based system, consisting of the NOC, the satellite link, and two types of HH.
- **Caches hierarchy:** tree-structured, with users requests being directed to the cache, and cache misses in lower levels percolating up through higher levels until the requested document is found in a cache or retrieved from an Internet Server.
- **Goal:** Analytically compare different caching strategies and choose the one that minimizes client latency.

### Methodology/Procedure

#### Strategies considered:
- passive caching
- active caching with local prefetching
- server-hint active caching

#### Metrics:
- hit/miss rate;
- response/access time;
- bandwidth utilization

### Significance

- Results obtained by several researchers suggest that the reduction in latency will be significant.
- Approaching the problem analytically, the results will have a greater generality, as opposed to the results obtained via simulation, which are highly dependent on the traces used.

### Project Results

- Studied caching algorithms and special issues regarding caching in a DBS-based architecture
- Researched literature for work regarding caching in computer systems, database materialization, and distributed file systems
- Collected some models for factors influencing the caching (document sizes, traffic, loss on satellite link, cache access time, etc.)
- Made preliminary steps in developing the passive caching model (assumptions and some delays)

### Future Work

- Analytically model the parts of the DBS-based system influencing the caching
- Model the different caching strategies
- Determine probable bound in latency reduction for each caching strategy and compare the results with the results obtained through simulation
- Extend the problem to the case of transparent caching between several NOC caches