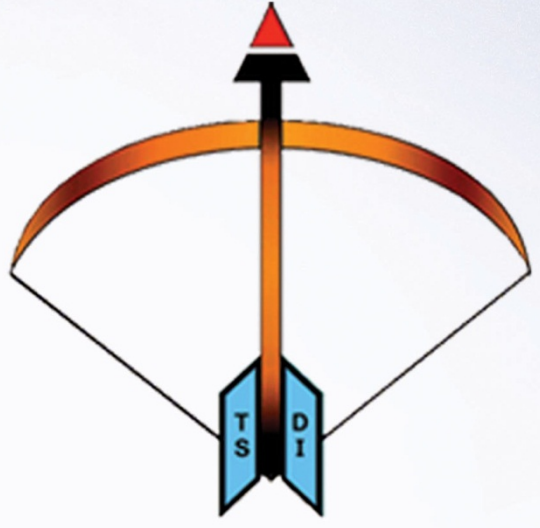




Mobility and Cloud – Operating in Intermittent, Austere Network Conditions

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Objectives

Our goal is to develop solutions to the challenges created by mobile-cloud interactions. These challenges arise due to wildly fluctuating wireless bandwidth, intermittent connectivity, and unreliable connectedness of mobile clients.

Benefits of study / Relevance to the navy

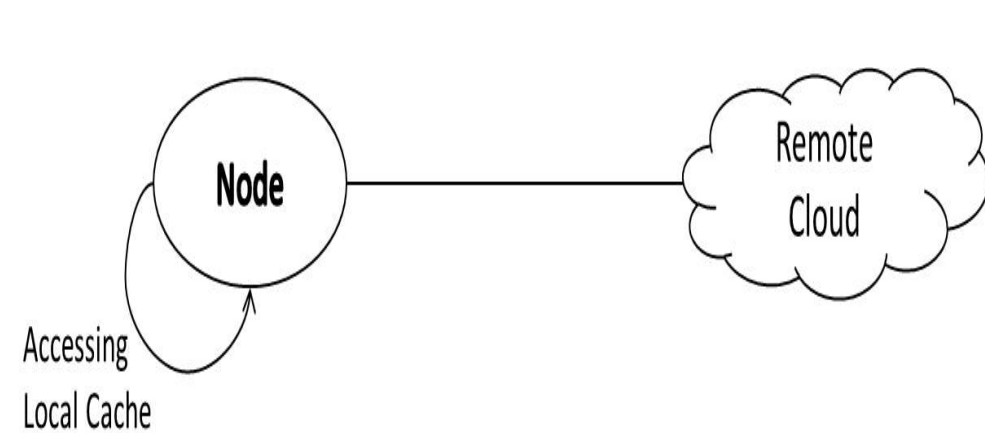
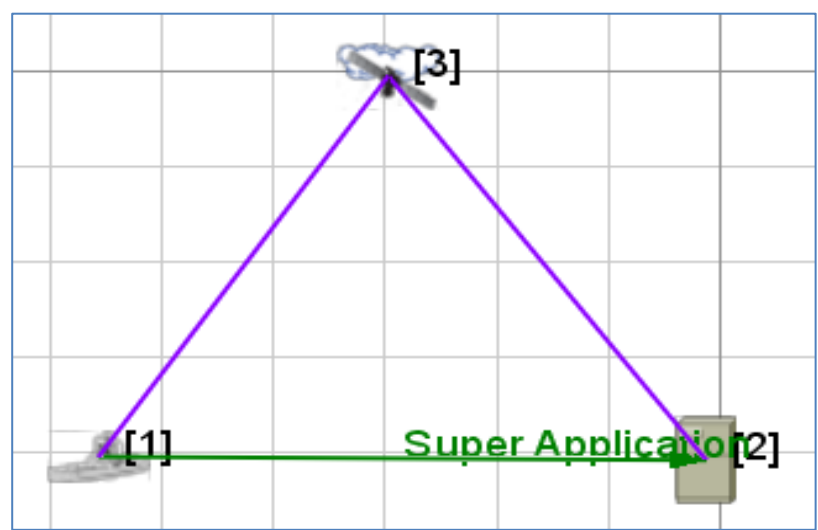
The scenarios and models developed in this thesis are useful not only to overcome the challenges of a disconnected, intermittent, limited (DIL) network, but also for the analysis of existing and future data requirements on navy ships. Benefits from the proposed strategies could be extended to the other land based platforms, as well as enterprise systems.

Areas of research / Related Work

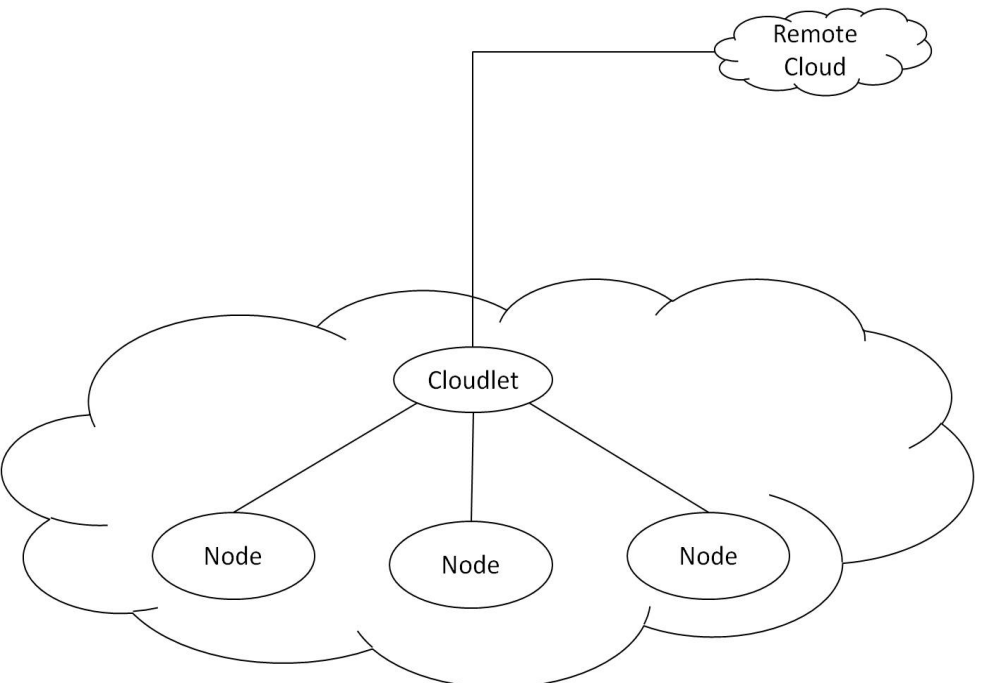
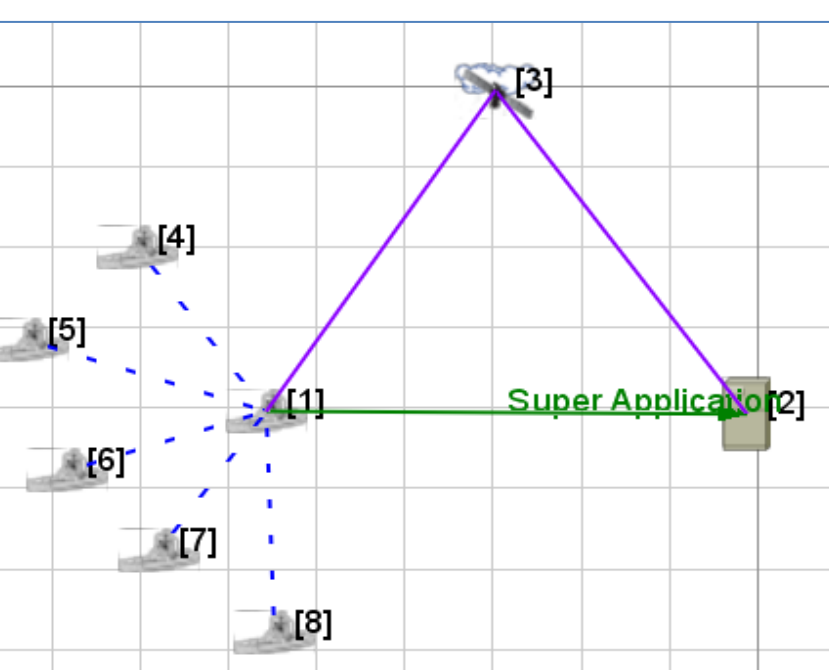
- Cache – similar to the concept of caching in Internet browser.
- Pre-fetching – algorithm to predict and bring data to the cache before they are needed.
- Cloudlets – think of it like a cache/mini-cloud, but located in another platform nearer to you as compared to the remote cloud.

Proposed Strategies

- Local cache helps to minimize the number of access to the remote cloud.



- Cloudlet helps to bring the cloud closer to the end nodes.

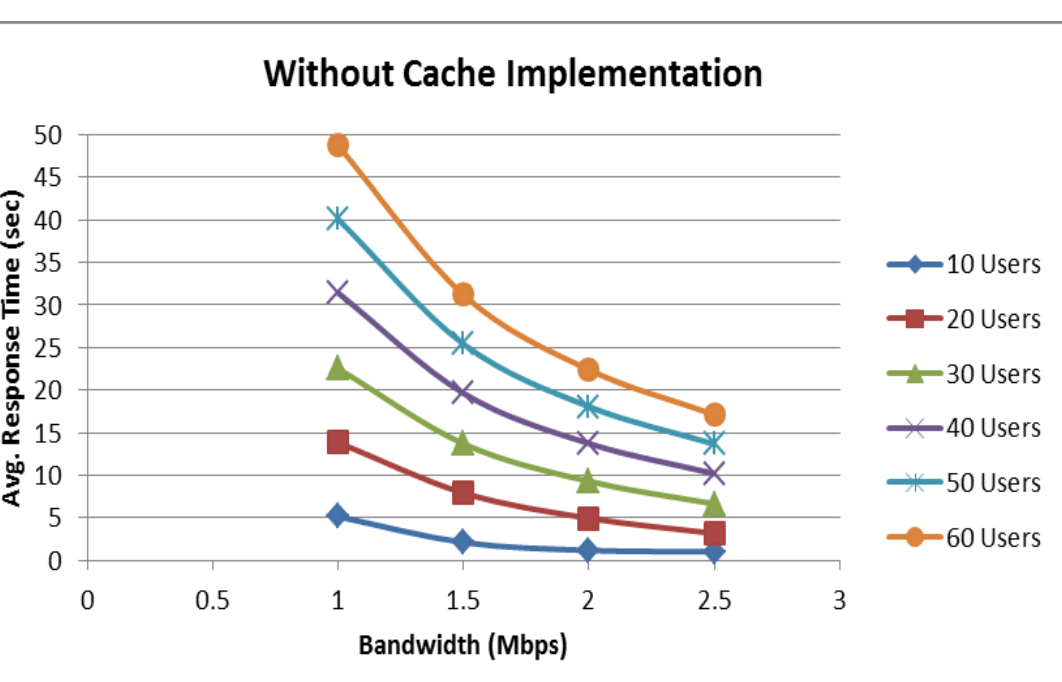


Measure of Effectiveness

Performance → Response time for the remote server to reply after source node initiates a request.

Simulation and Result Analysis

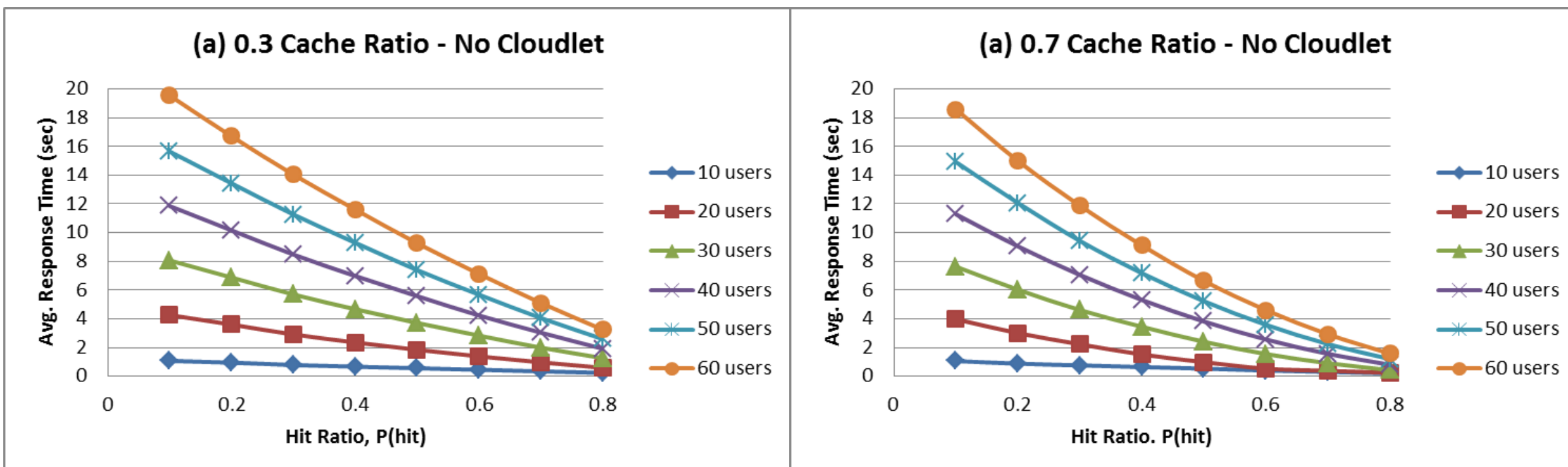
Base Case – NO cache & cloudlet



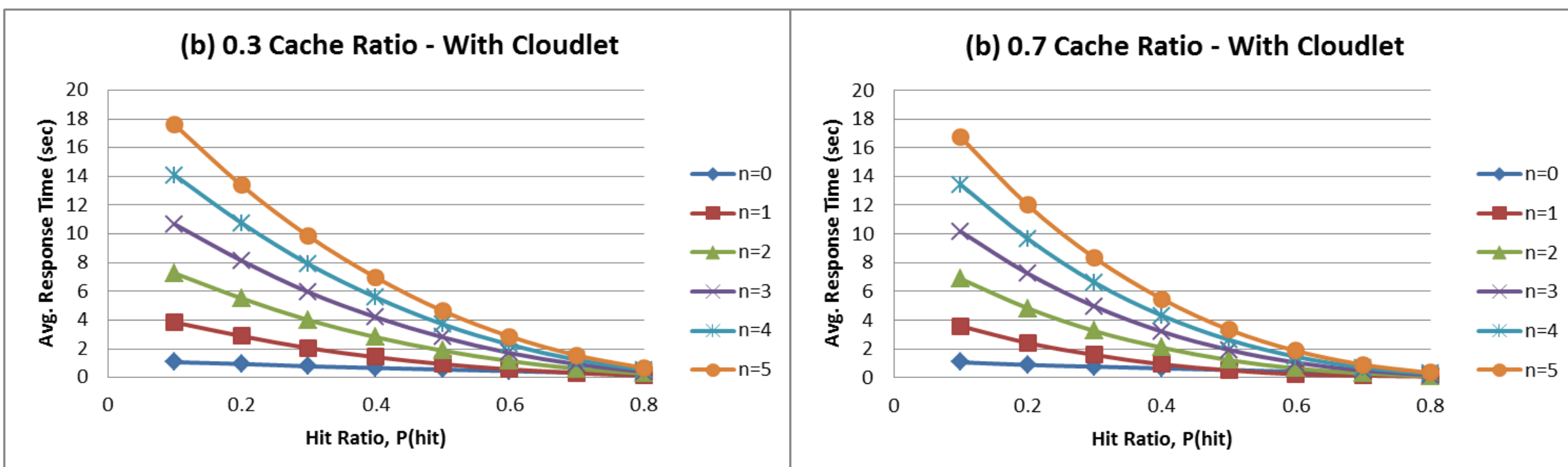
Parameters varied to test the effect on performance:

- Cache ratio
- No. of users
- Hit ratio

Case 1 – WITH cache



Case 2 – WITH cloudlet



Conclusion

- Proposed strategies have proved to be useful in overcoming challenges caused by DIL network conditions.
- Results from simulation have shown that cache and cloudlet can improve the performance → response time for the remote server to reply after source node initiates a request.

Future Work

- Practical evaluation on proposed strategies.
- Implementation of more than one cloudlet node
- Optimization of proposed strategies.
- Integration of pre-fetching algorithms.