Project Milestone Report

What we have done so far

We have implemented a Simulator to simulate snooping and directory-based cache coherence. We decided to build a simulator from scratch, scope it down to what we wanted to simulate, and also as a good learning experience.

We have implemented snooping-based cache coherence for the following protocols.

1) MI
2) MSI
3) MESI
4) MOESI
5) MESIF

We have implemented a directory-based cache coherence equivalent to MOESI/MESIF.

We currently gather the following metrics in our simulator

1) Cache Hits
2) Cache Misses
3) Evictions (Coherence Evictions)
4) Interconnect traffic.

We have created basic traces and have tested the snooping protocols with the basic traces. However, we still want to create a proper testing framework and test with more traces before we mark the testing work item complete.

We have not yet tested the directory-based coherence implementation; we just completed it yesterday.

How well are we doing with respect to our goals and deliverables?

We are doing well with respect to our goals and believe we will be able to hit the 100% target we initially planned.

We are considering adding more metrics (capacity evictions, conflict evictions) as a 125% target if time permits. We are considering using the evictions as a proxy for the misses, as it's easier to measure evictions compared to misses.

What we plan to show in the poster session

We plan to show graphs of selected analyses we have done on various workloads.

Issues concerning

How can we generate traces from real-life workloads?

Upcoming Plan

Week 1 (March 25 - March 31):		Assignee
Set up project repository and documentation	Done	D/S
Implement a basic cache simulator framework	Done	D/S
Week 2 (April 1 - April 7)		
Implement MSI/MESI coherence protocol in the simulator	Done	D/O
Create test cases and a validation framework	Ongoing	D/O
Week 3 (April 8 - April 14)		
Implement MESIF/MOESI	Done	D/O
Implement a directory-based scheme	Done	D/O
Prepare milestone report	Done	D/O

Week 4 (April 15 - April 21)		
Wrap up any remaining implementation tasks	TODO	D/O
Develop a benchmark suite for performance evaluation.	TODO	D/O
Conduct initial performance measurements.	TODO	D/O
Week 5 (April 22 - April 28):		
Perform final optimizations based on performance analysis	TODO	D/O
Create visualizations for result presentation	TODO	D/O
Prepare final report and poster	TODO	D/O