

# COMP 526 HW6

Mo Tang mt60

## Experiment 1.

I.

MOESI		
NUM_PROCESSORS = 1		
delay	Total Execution Time	
0	223132	
2	255900	
4	288668	
6	321436	
8	354204	
10	386972	
12	419740	
14	452508	
16	485276	
18	518044	
20	550812	
MOESI		
NUM_PROCESSORS = 2		
delay	Total Execution Time	
0	206664	
2	206696	
4	206728	
6	206770	
8	206834	
10	206898	
12	210022	
14	226406	
16	242790	
18	259174	
20	275558	

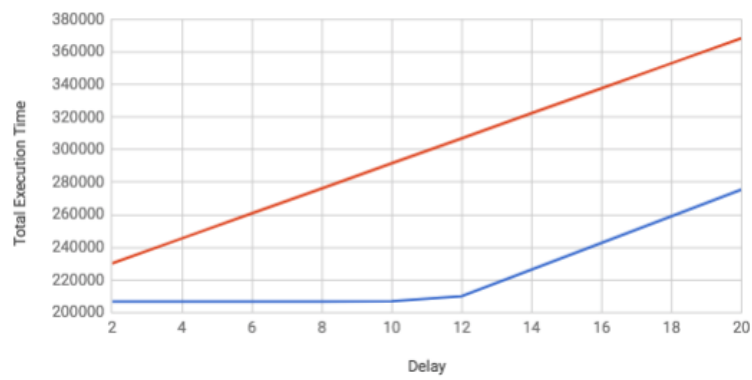
II.

MSI		
NUM_PROCESSORS = 1		
delay	Total Execution Time	
0	224156	
2	256924	
4	289692	
6	322460	
8	355228	
10	387996	
12	420764	
14	453532	
16	486300	
18	519068	
20	551836	
MOESI		
NUM_PROCESSORS = 2		
delay	Total Execution Time	
0	214842	
2	230203	
4	245565	
6	260927	
8	276289	
10	291651	
12	307013	
14	322375	
16	337737	
18	353099	
20	368461	

III.

PLOT 1A

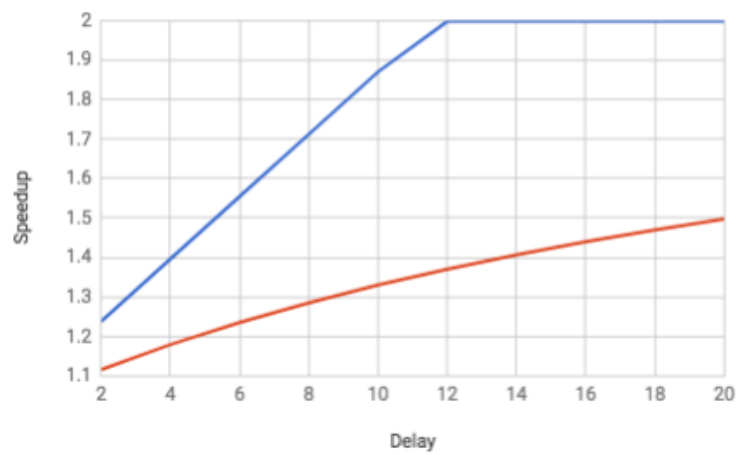
Red-MSI Blue-MOESI



IV.

PLOT 1B

Red-MSI Blue-MOESI



V.

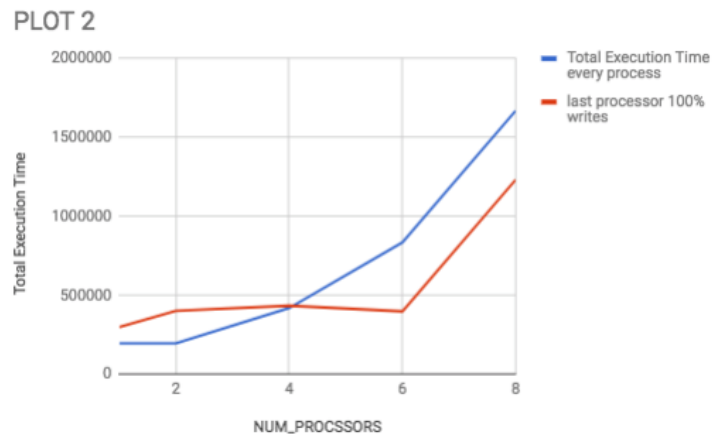
We can see from the plot that the execution time of MOESI protocol is longer than that of MSI protocol. And when it comes to speedup, MOESI goes to 2 quicker than MSI.

## Experiment 2.

III.

NUM_PROCSORS	Total Execution Time	
	every process	last processor 100% writes
1	194560	296860
2	194574	400284.01
4	417662	433145
6	835056	397487
8	1669936	1232367

IV.



V.

The execution time of blue curve is longer, as it will take 100 cycles to read from the memory, with no cache-to-cache the processor reads directly from memory. For the last processor 100% write, when it writes back to cache block, the state is M. For bus\_rd, the state is O. When num\_processors reach 8, the execution time will increase, because cache block has 8 integers.