Memory Simulation

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INTRODUCTION

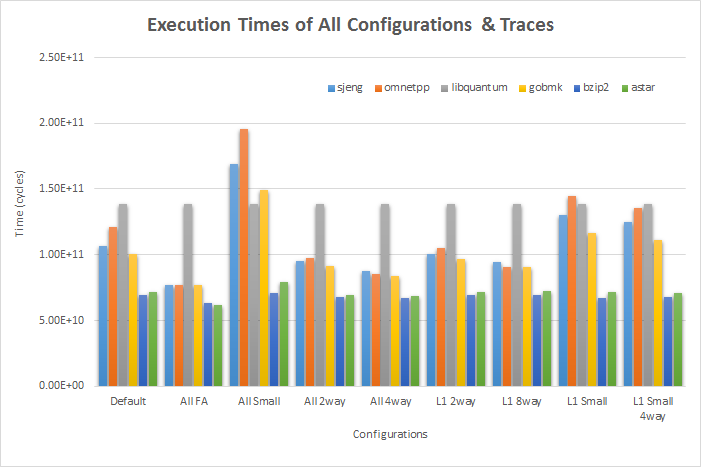
The objective of this project was to develop and implement a memory simulator capable of evaluating two levels of cache memory (write-allocated and write-back) and a main memory. 8-entry victim caches were included to reduce the degree of associativity, and each was implemented with a Least Recently Used (LRU) replacement policy.

A set of six production traces were used to output data with regards to the memory simulator’s cache configuration respective performance. Additionally, simulations were run for the following sizes of bandwidth to main memory: 8, 16, 32, and 64. Comparisons between cost and performance were made in order to determine the most efficient main memory system model, in terms of both cost and performance.

RESULTS

As is evident from Figure 1, execution times for the different configurations and traces show little variance, with the major exceptions being the All Small configuration and the libquantum trace. The libquantum trace exhibits the same execution time for all configurations, and this is due to (CPI being the same?) JEFF EXPLAIN THINGS. Mention that bzip2 also doesn’t change very much?

The omnetpp, gobmk, and sjeng traces have a markedly greater execution time for L1 Small and L1 Small 4way, and a significantly greater execution time for All Small. THIS IS BECAUSE REASONS

  
Figure 1

CPI comparison of all configurations and traces (see Figure 2) again highlights

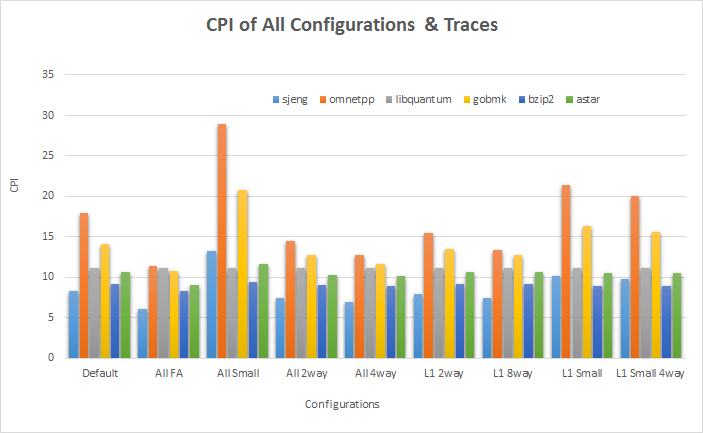


Figure 2

DISCUSSION

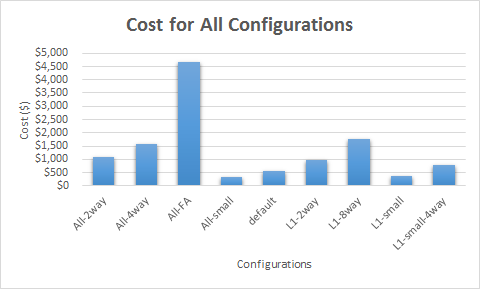


Figure 3

Observation of Fig. # shows a sharp decrease in performance from 8 and 16 bytes. Performance increases slightly as chunksize is increased from 16 bytes, but it is questionable whether or not the increase in cost is worth the larger bandwidth to main memory.

CONCLUSION

SIMULATOR CODE

PRODUCTION TRACE SIMULATION RESULTS

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astar.All-2way Simulation Results

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Memory system:

Dcache size = 8192 : ways = 2 : block size = 32

Icache size = 8192 : ways = 2 : block size = 32

L2-cache size = 32768 : ways = 2 : block size = 64

Memory ready time = 50 : chunksize = 8 : chunktime = 15

Execute time = 69678890572; Total refs = 10000000882

Inst refs = 6792328181; Data refs = 3207672701

Number of reference types: [Percentage]

Reads = 2570967807 [25.7%]

Writes = 636704894 [ 6.4%]

Inst. = 6792328181 [67.9%]

Total = 10000000882

Total cycles for activities: [Percentage]

Reads = 33906948328 [48.7%]

Writes = 17659870255 [25.3%]

Inst. = 18112071989 [26.0%]

Total = 69678890572

CPI = 10.3

Ideal: Exec. Time = 16792329063; CPI = 2.5

Ideal mis-aligned: Exec. Time = 22633347554; CPI = 3.3

Memory Level: L1i

Hit Count = 11304267758 Miss Count = 239347

Total Requests = 11304507105

Hit Rate = 100.0% Miss Rate = 0.0%

Kickouts = 83648; Dirty kickouts = 0; Transfers = 83912

VC Hit count = 155435

Memory Level: L1d

Hit Count = 4323107977 Miss Count = 213404291

Total Requests = 4536512268

Hit Rate = 95.3% Miss Rate = 4.7%

Kickouts = 199310538; Dirty kickouts = 84243336; Transfers = 199310802

VC Hit count = 14093489

Memory Level: L2

Hit Count = 139108988 Miss Count = 144529062

Total Requests = 283638050

Hit Rate = 49.0% Miss Rate = 51.0%

Kickouts = 139172090; Dirty kickouts = 68853742; Transfers = 139172610

VC Hit count = 5356452

L1 cache cost (Icache $400) + (Dcache $400) = $800

L2 cache cost = $200; Memory cost = $75 Total cost = $1075

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astar.All-4way Simulation Results

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Memory system:

Dcache size = 8192 : ways = 4 : block size = 32

Icache size = 8192 : ways = 4 : block size = 32

L2-cache size = 32768 : ways = 4 : block size = 64

Memory ready time = 50 : chunksize = 8 : chunktime = 15

Execute time = 68567566925; Total refs = 10000000882

Inst refs = 6792328181; Data refs = 3207672701

Number of reference types: [Percentage]

Reads = 2570967807 [25.7%]

Writes = 636704894 [ 6.4%]

Inst. = 6792328181 [67.9%]

Total = 10000000882

Total cycles for activities: [Percentage]

Reads = 33040878920 [48.2%]

Writes = 17424618315 [25.4%]

Inst. = 18102069690 [26.4%]

Total = 68567566925

CPI = 10.1

Ideal: Exec. Time = 16792329063; CPI = 2.5

Ideal mis-aligned: Exec. Time = 22633347554; CPI = 3.3

Memory Level: L1i

Hit Count = 11304448123 Miss Count = 58982

Total Requests = 11304507105

Hit Rate = 100.0% Miss Rate = 0.0%

Kickouts = 22485; Dirty kickouts = 0; Transfers = 22749

VC Hit count = 36233

Memory Level: L1d

Hit Count = 4337127391 Miss Count = 199384877

Total Requests = 4536512268

Hit Rate = 95.6% Miss Rate = 4.4%

Kickouts = 194964024; Dirty kickouts = 82953812; Transfers = 194964288

VC Hit count = 4420589

Memory Level: L2

Hit Count = 138950267 Miss Count = 138990582

Total Requests = 277940849

Hit Rate = 50.0% Miss Rate = 50.0%

Kickouts = 134637532; Dirty kickouts = 68487092; Transfers = 134638052

VC Hit count = 4352530

L1 cache cost (Icache $600) + (Dcache $600) = $1200

L2 cache cost = $300; Memory cost = $75 Total cost = $1575

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astar.All-FA Simulation Results

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Memory system:

Dcache size = 8192 : ways = 256 : block size = 32

Icache size = 8192 : ways = 256 : block size = 32

L2-cache size = 32768 : ways = 512 : block size = 64

Memory ready time = 50 : chunksize = 8 : chunktime = 15

Execute time = 61417825660; Total refs = 10000000882

Inst refs = 6792328181; Data refs = 3207672701

Number of reference types: [Percentage]

Reads = 2570967807 [25.7%]

Writes = 636704894 [ 6.4%]

Inst. = 6792328181 [67.9%]

Total = 10000000882

Total cycles for activities: [Percentage]

Reads = 26832135633 [43.7%]

Writes = 16488133847 [26.8%]

Inst. = 18097556180 [29.5%]

Total = 61417825660

CPI = 9.0

Ideal: Exec. Time = 16792329063; CPI = 2.5

Ideal mis-aligned: Exec. Time = 22633347554; CPI = 3.3

Memory Level: L1i

Hit Count = 11304502787 Miss Count = 4318

Total Requests = 11304507105

Hit Rate = 100.0% Miss Rate = 0.0%

Kickouts = 3968; Dirty kickouts = 0; Transfers = 4232

VC Hit count = 86

Memory Level: L1d

Hit Count = 4354819762 Miss Count = 181692506

Total Requests = 4536512268

Hit Rate = 96.0% Miss Rate = 4.0%

Kickouts = 179928510; Dirty kickouts = 79848713; Transfers = 179928774

VC Hit count = 1763732

Memory Level: L2

Hit Count = 155260644 Miss Count = 104521075

Total Requests = 259781719

Hit Rate = 59.8% Miss Rate = 40.2%

Kickouts = 104085385; Dirty kickouts = 64156775; Transfers = 104085905

VC Hit count = 435170

L1 cache cost (Icache $1800) + (Dcache $1800) = $3600

L2 cache cost = $1000; Memory cost = $75 Total cost = $4675

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astar.All-small Simulation Results

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Memory system:

Dcache size = 4096 : ways = 1 : block size = 32

Icache size = 4096 : ways = 1 : block size = 32

L2-cache size = 16384 : ways = 1 : block size = 64

Memory ready time = 50 : chunksize = 8 : chunktime = 15

Execute time = 79303684099; Total refs = 10000000882

Inst refs = 6792328181; Data refs = 3207672701

Number of reference types: [Percentage]

Reads = 2570967807 [25.7%]

Writes = 636704894 [ 6.4%]

Inst. = 6792328181 [67.9%]

Total = 10000000882

Total cycles for activities: [Percentage]

Reads = 41687468211 [52.6%]

Writes = 19342697220 [24.4%]

Inst. = 18273518668 [23.0%]

Total = 79303684099

CPI = 11.7

Ideal: Exec. Time = 16792329063; CPI = 2.5

Ideal mis-aligned: Exec. Time = 22633347554; CPI = 3.3

Memory Level: L1i

Hit Count = 11303198813 Miss Count = 1308292

Total Requests = 11304507105

Hit Rate = 100.0% Miss Rate = 0.0%

Kickouts = 1109964; Dirty kickouts = 0; Transfers = 1110100

VC Hit count = 198192

Memory Level: L1d

Hit Count = 4027596117 Miss Count = 508916151

Total Requests = 4536512268

Hit Rate = 88.8% Miss Rate = 11.2%

Kickouts = 230578556; Dirty kickouts = 92441707; Transfers = 230578692

VC Hit count = 278337459

Memory Level: L2

Hit Count = 137117862 Miss Count = 187012637

Total Requests = 324130499

Hit Rate = 42.3% Miss Rate = 57.7%

Kickouts = 175211060; Dirty kickouts = 75979408; Transfers = 175211324

VC Hit count = 11801313

L1 cache cost (Icache $100) + (Dcache $100) = $200

L2 cache cost = $50; Memory cost = $75 Total cost = $325

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astar.default Simulation Results

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Memory system:

Dcache size = 8192 : ways = 1 : block size = 32

Icache size = 8192 : ways = 1 : block size = 32

L2-cache size = 32768 : ways = 1 : block size = 64

Memory ready time = 50 : chunksize = 8 : chunktime = 15

Execute time = 71752044381; Total refs = 10000000882

Inst refs = 6792328181; Data refs = 3207672701

Number of reference types: [Percentage]

Reads = 2570967807 [25.7%]

Writes = 636704894 [ 6.4%]

Inst. = 6792328181 [67.9%]

Total = 10000000882

Total cycles for activities: [Percentage]

Reads = 35358301275 [49.3%]

Writes = 18227281281 [25.4%]

Inst. = 18166461825 [25.3%]

Total = 71752044381

CPI = 10.6

Ideal: Exec. Time = 16792329063; CPI = 2.5

Ideal mis-aligned: Exec. Time = 22633347554; CPI = 3.3

Memory Level: L1i

Hit Count = 11303848034 Miss Count = 659071

Total Requests = 11304507105

Hit Rate = 100.0% Miss Rate = 0.0%

Kickouts = 421517; Dirty kickouts = 0; Transfers = 421781

VC Hit count = 237290

Memory Level: L1d

Hit Count = 4276756770 Miss Count = 259755498

Total Requests = 4536512268

Hit Rate = 94.3% Miss Rate = 5.7%

Kickouts = 205412869; Dirty kickouts = 86399517; Transfers = 205413133

VC Hit count = 54342365

Memory Level: L2

Hit Count = 134971398 Miss Count = 157263033

Total Requests = 292234431

Hit Rate = 46.2% Miss Rate = 53.8%

Kickouts = 147644858; Dirty kickouts = 69593999; Transfers = 147645378

VC Hit count = 9617655

L1 cache cost (Icache $200) + (Dcache $200) = $400

L2 cache cost = $100; Memory cost = $75 Total cost = $575

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astar.L1-2way Simulation Results

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Memory system:

Dcache size = 8192 : ways = 2 : block size = 32

Icache size = 8192 : ways = 2 : block size = 32

L2-cache size = 32768 : ways = 1 : block size = 64

Memory ready time = 50 : chunksize = 8 : chunktime = 15

Execute time = 71893575882; Total refs = 10000000882

Inst refs = 6792328181; Data refs = 3207672701

Number of reference types: [Percentage]

Reads = 2570967807 [25.7%]

Writes = 636704894 [ 6.4%]

Inst. = 6792328181 [67.9%]

Total = 10000000882

Total cycles for activities: [Percentage]

Reads = 35600756858 [49.5%]

Writes = 18180786925 [25.3%]

Inst. = 18112032099 [25.2%]

Total = 71893575882

CPI = 10.6

Ideal: Exec. Time = 16792329063; CPI = 2.5

Ideal mis-aligned: Exec. Time = 22633347554; CPI = 3.3

Memory Level: L1i

Hit Count = 11304267758 Miss Count = 239347

Total Requests = 11304507105

Hit Rate = 100.0% Miss Rate = 0.0%

Kickouts = 83648; Dirty kickouts = 0; Transfers = 83912

VC Hit count = 155435

Memory Level: L1d

Hit Count = 4323107977 Miss Count = 213404291

Total Requests = 4536512268

Hit Rate = 95.3% Miss Rate = 4.7%

Kickouts = 199310538; Dirty kickouts = 84243336; Transfers = 199310802

VC Hit count = 14093489

Memory Level: L2

Hit Count = 128014809 Miss Count = 155623241

Total Requests = 283638050

Hit Rate = 45.1% Miss Rate = 54.9%

Kickouts = 149667456; Dirty kickouts = 70045840; Transfers = 149667976

VC Hit count = 5955265

L1 cache cost (Icache $400) + (Dcache $400) = $800

L2 cache cost = $100; Memory cost = $75 Total cost = $975

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astar.L1-8way Simulation Results

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Memory system:

Dcache size = 8192 : ways = 8 : block size = 32

Icache size = 8192 : ways = 8 : block size = 32

L2-cache size = 32768 : ways = 1 : block size = 64

Memory ready time = 50 : chunksize = 8 : chunktime = 15

Execute time = 72063482373; Total refs = 10000000882

Inst refs = 6792328181; Data refs = 3207672701

Number of reference types: [Percentage]

Reads = 2570967807 [25.7%]

Writes = 636704894 [ 6.4%]

Inst. = 6792328181 [67.9%]

Total = 10000000882

Total cycles for activities: [Percentage]

Reads = 35759677909 [49.6%]

Writes = 18205725889 [25.3%]

Inst. = 18098078575 [25.1%]

Total = 72063482373

CPI = 10.6

Ideal: Exec. Time = 16792329063; CPI = 2.5

Ideal mis-aligned: Exec. Time = 22633347554; CPI = 3.3

Memory Level: L1i

Hit Count = 11304476062 Miss Count = 31043

Total Requests = 11304507105

Hit Rate = 100.0% Miss Rate = 0.0%

Kickouts = 5788; Dirty kickouts = 0; Transfers = 6052

VC Hit count = 24991

Memory Level: L1d

Hit Count = 4338980044 Miss Count = 197532224

Total Requests = 4536512268

Hit Rate = 95.6% Miss Rate = 4.4%

Kickouts = 192466167; Dirty kickouts = 82337101; Transfers = 192466431

VC Hit count = 5065793

Memory Level: L2

Hit Count = 119032564 Miss Count = 155777020

Total Requests = 274809584

Hit Rate = 43.3% Miss Rate = 56.7%

Kickouts = 152021853; Dirty kickouts = 70089477; Transfers = 152022373

VC Hit count = 3754647

L1 cache cost (Icache $800) + (Dcache $800) = $1600

L2 cache cost = $100; Memory cost = $75 Total cost = $1775

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astar.L1-small Simulation Results

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Memory system:

Dcache size = 4096 : ways = 1 : block size = 32

Icache size = 4096 : ways = 1 : block size = 32

L2-cache size = 32768 : ways = 1 : block size = 64

Memory ready time = 50 : chunksize = 8 : chunktime = 15

Execute time = 71347308869; Total refs = 10000000882

Inst refs = 6792328181; Data refs = 3207672701

Number of reference types: [Percentage]

Reads = 2570967807 [25.7%]

Writes = 636704894 [ 6.4%]

Inst. = 6792328181 [67.9%]

Total = 10000000882

Total cycles for activities: [Percentage]

Reads = 35660283211 [50.0%]

Writes = 17426674510 [24.4%]

Inst. = 18260351148 [25.6%]

Total = 71347308869

CPI = 10.5

Ideal: Exec. Time = 16792329063; CPI = 2.5

Ideal mis-aligned: Exec. Time = 22633347554; CPI = 3.3

Memory Level: L1i

Hit Count = 11303198813 Miss Count = 1308292

Total Requests = 11304507105

Hit Rate = 100.0% Miss Rate = 0.0%

Kickouts = 1109964; Dirty kickouts = 0; Transfers = 1110100

VC Hit count = 198192

Memory Level: L1d

Hit Count = 4027596117 Miss Count = 508916151

Total Requests = 4536512268

Hit Rate = 88.8% Miss Rate = 11.2%

Kickouts = 230578556; Dirty kickouts = 92441707; Transfers = 230578692

VC Hit count = 278337459

Memory Level: L2

Hit Count = 177176963 Miss Count = 146953536

Total Requests = 324130499

Hit Rate = 54.7% Miss Rate = 45.3%

Kickouts = 139281176; Dirty kickouts = 69932457; Transfers = 139281696

VC Hit count = 7671840

L1 cache cost (Icache $100) + (Dcache $100) = $200

L2 cache cost = $100; Memory cost = $75 Total cost = $375

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astar.L1-small-4way Simulation Results

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Memory system:

Dcache size = 4096 : ways = 4 : block size = 32

Icache size = 4096 : ways = 4 : block size = 32

L2-cache size = 32768 : ways = 1 : block size = 64

Memory ready time = 50 : chunksize = 8 : chunktime = 15

Execute time = 70987210560; Total refs = 10000000882

Inst refs = 6792328181; Data refs = 3207672701

Number of reference types: [Percentage]

Reads = 2570967807 [25.7%]

Writes = 636704894 [ 6.4%]

Inst. = 6792328181 [67.9%]

Total = 10000000882

Total cycles for activities: [Percentage]

Reads = 35526487154 [50.0%]

Writes = 17287830794 [24.4%]

Inst. = 18172892612 [25.6%]

Total = 70987210560

CPI = 10.5

Ideal: Exec. Time = 16792329063; CPI = 2.5

Ideal mis-aligned: Exec. Time = 22633347554; CPI = 3.3

Memory Level: L1i

Hit Count = 11303728781 Miss Count = 778324

Total Requests = 11304507105

Hit Rate = 100.0% Miss Rate = 0.0%

Kickouts = 490903; Dirty kickouts = 0; Transfers = 491039

VC Hit count = 287285

Memory Level: L1d

Hit Count = 4302603636 Miss Count = 233908632

Total Requests = 4536512268

Hit Rate = 94.8% Miss Rate = 5.2%

Kickouts = 221374917; Dirty kickouts = 86690773; Transfers = 221375053

VC Hit count = 12533579

Memory Level: L2

Hit Count = 162759002 Miss Count = 145797863

Total Requests = 308556865

Hit Rate = 52.7% Miss Rate = 47.3%

Kickouts = 141078993; Dirty kickouts = 70151627; Transfers = 141079513

VC Hit count = 4718350

L1 cache cost (Icache $300) + (Dcache $300) = $600

L2 cache cost = $100; Memory cost = $75 Total cost = $775

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bzip2.All-2way Simulation Results

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Memory system:

Dcache size = 8192 : ways = 2 : block size = 32

Icache size = 8192 : ways = 2 : block size = 32

L2-cache size = 32768 : ways = 2 : block size = 64

Memory ready time = 50 : chunksize = 8 : chunktime = 15

Execute time = 68181000434; Total refs = 10000001164

Inst refs = 7566121173; Data refs = 2433879991

Number of reference types: [Percentage]

Reads = 1881417428 [18.8%]

Writes = 552462563 [ 5.5%]

Inst. = 7566121173 [75.7%]

Total = 10000001164

Total cycles for activities: [Percentage]

Reads = 24115444613 [35.4%]

Writes = 24400881099 [35.8%]

Inst. = 19664674722 [28.8%]

Total = 68181000434

CPI = 9.0

Ideal: Exec. Time = 17566122337; CPI = 2.3

Ideal mis-aligned: Exec. Time = 22200012564; CPI = 2.9

Memory Level: L1i

Hit Count = 12096913205 Miss Count = 11111

Total Requests = 12096924316

Hit Rate = 100.0% Miss Rate = 0.0%

Kickouts = 9100; Dirty kickouts = 0; Transfers = 9364

VC Hit count = 1747

Memory Level: L1d

Hit Count = 2376700760 Miss Count = 160266315

Total Requests = 2536967075

Hit Rate = 93.7% Miss Rate = 6.3%

Kickouts = 158933953; Dirty kickouts = 63191897; Transfers = 158934217

VC Hit count = 1332098

Memory Level: L2

Hit Count = 65935568 Miss Count = 156199910

Total Requests = 222135478

Hit Rate = 29.7% Miss Rate = 70.3%

Kickouts = 154403557; Dirty kickouts = 56923245; Transfers = 154404077

VC Hit count = 1795833

L1 cache cost (Icache $400) + (Dcache $400) = $800

L2 cache cost = $200; Memory cost = $75 Total cost = $1075

-------------------------------------------------------------------------

bzip2.All-4way Simulation Results

-------------------------------------------------------------------------

Memory system:

Dcache size = 8192 : ways = 4 : block size = 32

Icache size = 8192 : ways = 4 : block size = 32

L2-cache size = 32768 : ways = 4 : block size = 64

Memory ready time = 50 : chunksize = 8 : chunktime = 15

Execute time = 67383440400; Total refs = 10000001164

Inst refs = 7566121173; Data refs = 2433879991

Number of reference types: [Percentage]

Reads = 1881417428 [18.8%]

Writes = 552462563 [ 5.5%]

Inst. = 7566121173 [75.7%]

Total = 10000001164

Total cycles for activities: [Percentage]

Reads = 23796803209 [35.3%]

Writes = 23922001955 [35.5%]

Inst. = 19664635236 [29.2%]

Total = 67383440400

CPI = 8.9

Ideal: Exec. Time = 17566122337; CPI = 2.3

Ideal mis-aligned: Exec. Time = 22200012564; CPI = 2.9

Memory Level: L1i

Hit Count = 12096914953 Miss Count = 9363

Total Requests = 12096924316

Hit Rate = 100.0% Miss Rate = 0.0%

Kickouts = 8989; Dirty kickouts = 0; Transfers = 9253

VC Hit count = 110

Memory Level: L1d

Hit Count = 2378622038 Miss Count = 158345037

Total Requests = 2536967075

Hit Rate = 93.8% Miss Rate = 6.2%

Kickouts = 157884316; Dirty kickouts = 62729069; Transfers = 157884580

VC Hit count = 460457

Memory Level: L2

Hit Count = 68248784 Miss Count = 152374118

Total Requests = 220622902

Hit Rate = 30.9% Miss Rate = 69.1%

Kickouts = 150923686; Dirty kickouts = 56430744; Transfers = 150924206

VC Hit count = 1449912

L1 cache cost (Icache $600) + (Dcache $600) = $1200

L2 cache cost = $300; Memory cost = $75 Total cost = $1575

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bzip2.All-FA Simulation Results

-------------------------------------------------------------------------

Memory system:

Dcache size = 8192 : ways = 256 : block size = 32

Icache size = 8192 : ways = 256 : block size = 32

L2-cache size = 32768 : ways = 512 : block size = 64

Memory ready time = 50 : chunksize = 8 : chunktime = 15

Execute time = 62913989994; Total refs = 10000001164

Inst refs = 7566121173; Data refs = 2433879991

Number of reference types: [Percentage]

Reads = 1881417428 [18.8%]

Writes = 552462563 [ 5.5%]

Inst. = 7566121173 [75.7%]

Total = 10000001164

Total cycles for activities: [Percentage]

Reads = 22732621180 [36.1%]

Writes = 20516738334 [32.6%]

Inst. = 19664630480 [31.3%]

Total = 62913989994

CPI = 8.3

Ideal: Exec. Time = 17566122337; CPI = 2.3

Ideal mis-aligned: Exec. Time = 22200012564; CPI = 2.9

Memory Level: L1i

Hit Count = 12096914907 Miss Count = 9409

Total Requests = 12096924316

Hit Rate = 100.0% Miss Rate = 0.0%

Kickouts = 9045; Dirty kickouts = 0; Transfers = 9309

VC Hit count = 100

Memory Level: L1d

Hit Count = 2379495474 Miss Count = 157471601

Total Requests = 2536967075

Hit Rate = 93.8% Miss Rate = 6.2%

Kickouts = 157210497; Dirty kickouts = 62437590; Transfers = 157210761

VC Hit count = 260840

Memory Level: L2

Hit Count = 90769890 Miss Count = 128887770

Total Requests = 219657660

Hit Rate = 41.3% Miss Rate = 58.7%

Kickouts = 128035659; Dirty kickouts = 55948289; Transfers = 128036179

VC Hit count = 851591

L1 cache cost (Icache $1800) + (Dcache $1800) = $3600

L2 cache cost = $1000; Memory cost = $75 Total cost = $4675

-------------------------------------------------------------------------

bzip2.All-small Simulation Results

-------------------------------------------------------------------------

Memory system:

Dcache size = 4096 : ways = 1 : block size = 32

Icache size = 4096 : ways = 1 : block size = 32

L2-cache size = 16384 : ways = 1 : block size = 64

Memory ready time = 50 : chunksize = 8 : chunktime = 15

Execute time = 70910807217; Total refs = 10000001164

Inst refs = 7566121173; Data refs = 2433879991

Number of reference types: [Percentage]

Reads = 1881417428 [18.8%]

Writes = 552462563 [ 5.5%]

Inst. = 7566121173 [75.7%]

Total = 10000001164

Total cycles for activities: [Percentage]

Reads = 25852929583 [36.5%]

Writes = 25387078192 [35.8%]

Inst. = 19670799442 [27.7%]

Total = 70910807217

CPI = 9.4

Ideal: Exec. Time = 17566122337; CPI = 2.3

Ideal mis-aligned: Exec. Time = 22200012564; CPI = 2.9

Memory Level: L1i

Hit Count = 12096123209 Miss Count = 801107

Total Requests = 12096924316

Hit Rate = 100.0% Miss Rate = 0.0%

Kickouts = 33226; Dirty kickouts = 0; Transfers = 33362

VC Hit count = 767745

Memory Level: L1d

Hit Count = 2333607763 Miss Count = 203359312

Total Requests = 2536967075

Hit Rate = 92.0% Miss Rate = 8.0%

Kickouts = 169325300; Dirty kickouts = 67486415; Transfers = 169325436

VC Hit count = 34033876

Memory Level: L2

Hit Count = 67699778 Miss Count = 169145435

Total Requests = 236845213

Hit Rate = 28.6% Miss Rate = 71.4%

Kickouts = 164138659; Dirty kickouts = 59102821; Transfers = 164138923

VC Hit count = 5006512

L1 cache cost (Icache $100) + (Dcache $100) = $200

L2 cache cost = $50; Memory cost = $75 Total cost = $325

-------------------------------------------------------------------------

bzip2.default Simulation Results

-------------------------------------------------------------------------

Memory system:

Dcache size = 8192 : ways = 1 : block size = 32

Icache size = 8192 : ways = 1 : block size = 32

L2-cache size = 32768 : ways = 1 : block size = 64

Memory ready time = 50 : chunksize = 8 : chunktime = 15

Execute time = 69414271706; Total refs = 10000001164

Inst refs = 7566121173; Data refs = 2433879991

Number of reference types: [Percentage]

Reads = 1881417428 [18.8%]

Writes = 552462563 [ 5.5%]

Inst. = 7566121173 [75.7%]

Total = 10000001164

Total cycles for activities: [Percentage]

Reads = 24692333956 [35.6%]

Writes = 25053604538 [36.1%]

Inst. = 19668333212 [28.3%]

Total = 69414271706

CPI = 9.2

Ideal: Exec. Time = 17566122337; CPI = 2.3

Ideal mis-aligned: Exec. Time = 22200012564; CPI = 2.9

Memory Level: L1i

Hit Count = 12096136739 Miss Count = 787577

Total Requests = 12096924316

Hit Rate = 100.0% Miss Rate = 0.0%

Kickouts = 21573; Dirty kickouts = 0; Transfers = 21837

VC Hit count = 765740

Memory Level: L1d

Hit Count = 2358684140 Miss Count = 178282935

Total Requests = 2536967075

Hit Rate = 93.0% Miss Rate = 7.0%

Kickouts = 160892153; Dirty kickouts = 63990996; Transfers = 160892417

VC Hit count = 17390518

Memory Level: L2

Hit Count = 61694563 Miss Count = 163210687

Total Requests = 224905250

Hit Rate = 27.4% Miss Rate = 72.6%

Kickouts = 159485691; Dirty kickouts = 57767871; Transfers = 159486211

VC Hit count = 3724476

L1 cache cost (Icache $200) + (Dcache $200) = $400

L2 cache cost = $100; Memory cost = $75 Total cost = $575

-------------------------------------------------------------------------

bzip2.L1-2way Simulation Results

-------------------------------------------------------------------------

Memory system:

Dcache size = 8192 : ways = 2 : block size = 32

Icache size = 8192 : ways = 2 : block size = 32

L2-cache size = 32768 : ways = 1 : block size = 64

Memory ready time = 50 : chunksize = 8 : chunktime = 15

Execute time = 69420214024; Total refs = 10000001164

Inst refs = 7566121173; Data refs = 2433879991

Number of reference types: [Percentage]

Reads = 1881417428 [18.8%]

Writes = 552462563 [ 5.5%]

Inst. = 7566121173 [75.7%]

Total = 10000001164

Total cycles for activities: [Percentage]

Reads = 24662798843 [35.5%]

Writes = 25092747689 [36.1%]

Inst. = 19664667492 [28.3%]

Total = 69420214024

CPI = 9.2

Ideal: Exec. Time = 17566122337; CPI = 2.3

Ideal mis-aligned: Exec. Time = 22200012564; CPI = 2.9

Memory Level: L1i

Hit Count = 12096913205 Miss Count = 11111

Total Requests = 12096924316

Hit Rate = 100.0% Miss Rate = 0.0%

Kickouts = 9100; Dirty kickouts = 0; Transfers = 9364

VC Hit count = 1747

Memory Level: L1d

Hit Count = 2376700760 Miss Count = 160266315

Total Requests = 2536967075

Hit Rate = 93.7% Miss Rate = 6.3%

Kickouts = 158933953; Dirty kickouts = 63191897; Transfers = 158934217

VC Hit count = 1332098

Memory Level: L2

Hit Count = 59835459 Miss Count = 162300019

Total Requests = 222135478

Hit Rate = 26.9% Miss Rate = 73.1%

Kickouts = 160206029; Dirty kickouts = 57666398; Transfers = 160206549

VC Hit count = 2093470

L1 cache cost (Icache $400) + (Dcache $400) = $800

L2 cache cost = $100; Memory cost = $75 Total cost = $975

-------------------------------------------------------------------------

bzip2.L1-8way Simulation Results

-------------------------------------------------------------------------

Memory system:

Dcache size = 8192 : ways = 8 : block size = 32

Icache size = 8192 : ways = 8 : block size = 32

L2-cache size = 32768 : ways = 1 : block size = 64

Memory ready time = 50 : chunksize = 8 : chunktime = 15

Execute time = 69413909594; Total refs = 10000001164

Inst refs = 7566121173; Data refs = 2433879991

Number of reference types: [Percentage]

Reads = 1881417428 [18.8%]

Writes = 552462563 [ 5.5%]

Inst. = 7566121173 [75.7%]

Total = 10000001164

Total cycles for activities: [Percentage]

Reads = 24586776122 [35.4%]

Writes = 25162511042 [36.2%]

Inst. = 19664622430 [28.3%]

Total = 69413909594

CPI = 9.2

Ideal: Exec. Time = 17566122337; CPI = 2.3

Ideal mis-aligned: Exec. Time = 22200012564; CPI = 2.9

Memory Level: L1i

Hit Count = 12096914965 Miss Count = 9351

Total Requests = 12096924316

Hit Rate = 100.0% Miss Rate = 0.0%

Kickouts = 8981; Dirty kickouts = 0; Transfers = 9245

VC Hit count = 106

Memory Level: L1d

Hit Count = 2379130706 Miss Count = 157836369

Total Requests = 2536967075

Hit Rate = 93.8% Miss Rate = 6.2%

Kickouts = 157495828; Dirty kickouts = 62564308; Transfers = 157496092

VC Hit count = 340277

Memory Level: L2

Hit Count = 58131594 Miss Count = 161938051

Total Requests = 220069645

Hit Rate = 26.4% Miss Rate = 73.6%

Kickouts = 160940504; Dirty kickouts = 57251869; Transfers = 160941024

VC Hit count = 997027

L1 cache cost (Icache $800) + (Dcache $800) = $1600

L2 cache cost = $100; Memory cost = $75 Total cost = $1775

-------------------------------------------------------------------------

bzip2.L1-small Simulation Results

-------------------------------------------------------------------------

Memory system:

Dcache size = 4096 : ways = 1 : block size = 32

Icache size = 4096 : ways = 1 : block size = 32

L2-cache size = 32768 : ways = 1 : block size = 64

Memory ready time = 50 : chunksize = 8 : chunktime = 15

Execute time = 67322658707; Total refs = 10000001164

Inst refs = 7566121173; Data refs = 2433879991

Number of reference types: [Percentage]

Reads = 1881417428 [18.8%]

Writes = 552462563 [ 5.5%]

Inst. = 7566121173 [75.7%]

Total = 10000001164

Total cycles for activities: [Percentage]

Reads = 24450460023 [36.3%]

Writes = 23201599972 [34.5%]

Inst. = 19670598712 [29.2%]

Total = 67322658707

CPI = 8.9

Ideal: Exec. Time = 17566122337; CPI = 2.3

Ideal mis-aligned: Exec. Time = 22200012564; CPI = 2.9

Memory Level: L1i

Hit Count = 12096123209 Miss Count = 801107

Total Requests = 12096924316

Hit Rate = 100.0% Miss Rate = 0.0%

Kickouts = 33226; Dirty kickouts = 0; Transfers = 33362

VC Hit count = 767745

Memory Level: L1d

Hit Count = 2333607763 Miss Count = 203359312

Total Requests = 2536967075

Hit Rate = 92.0% Miss Rate = 8.0%

Kickouts = 169325300; Dirty kickouts = 67486415; Transfers = 169325436

VC Hit count = 34033876

Memory Level: L2

Hit Count = 86094651 Miss Count = 150750562

Total Requests = 236845213

Hit Rate = 36.4% Miss Rate = 63.6%

Kickouts = 146883618; Dirty kickouts = 57445385; Transfers = 146884138

VC Hit count = 3866424

L1 cache cost (Icache $100) + (Dcache $100) = $200

L2 cache cost = $100; Memory cost = $75 Total cost = $375

-------------------------------------------------------------------------

bzip2.L1-small-4way Simulation Results

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Memory system:

Dcache size = 4096 : ways = 4 : block size = 32

Icache size = 4096 : ways = 4 : block size = 32

L2-cache size = 32768 : ways = 1 : block size = 64

Memory ready time = 50 : chunksize = 8 : chunktime = 15

Execute time = 67472679640; Total refs = 10000001164

Inst refs = 7566121173; Data refs = 2433879991

Number of reference types: [Percentage]

Reads = 1881417428 [18.8%]

Writes = 552462563 [ 5.5%]

Inst. = 7566121173 [75.7%]

Total = 10000001164

Total cycles for activities: [Percentage]

Reads = 24376440930 [36.1%]

Writes = 23427204277 [34.7%]

Inst. = 19669034433 [29.2%]

Total = 67472679640

CPI = 8.9

Ideal: Exec. Time = 17566122337; CPI = 2.3

Ideal mis-aligned: Exec. Time = 22200012564; CPI = 2.9

Memory Level: L1i

Hit Count = 12096892362 Miss Count = 31954

Total Requests = 12096924316

Hit Rate = 100.0% Miss Rate = 0.0%

Kickouts = 29104; Dirty kickouts = 0; Transfers = 29240

VC Hit count = 2714

Memory Level: L1d

Hit Count = 2370047161 Miss Count = 166919914

Total Requests = 2536967075

Hit Rate = 93.4% Miss Rate = 6.6%

Kickouts = 165602663; Dirty kickouts = 65475972; Transfers = 165602799

VC Hit count = 1317115

Memory Level: L2

Hit Count = 80478473 Miss Count = 150629538

Total Requests = 231108011

Hit Rate = 34.8% Miss Rate = 65.2%

Kickouts = 148851165; Dirty kickouts = 57417179; Transfers = 148851685

VC Hit count = 1777853

L1 cache cost (Icache $300) + (Dcache $300) = $600

L2 cache cost = $100; Memory cost = $75 Total cost = $775

-------------------------------------------------------------------------

gobmk.All-2way Simulation Results

-------------------------------------------------------------------------

Memory system:

Dcache size = 8192 : ways = 2 : block size = 32

Icache size = 8192 : ways = 2 : block size = 32

L2-cache size = 32768 : ways = 2 : block size = 64

Memory ready time = 50 : chunksize = 8 : chunktime = 15

Execute time = 91112175253; Total refs = 10000000628

Inst refs = 7146163623; Data refs = 2853837005

Number of reference types: [Percentage]

Reads = 1921584739 [19.2%]

Writes = 932252266 [ 9.3%]

Inst. = 7146163623 [71.5%]

Total = 10000000628

Total cycles for activities: [Percentage]

Reads = 17207873551 [18.9%]

Writes = 15849868867 [17.4%]

Inst. = 58054432835 [63.7%]

Total = 91112175253

CPI = 12.7

Ideal: Exec. Time = 17146164251; CPI = 2.4

Ideal mis-aligned: Exec. Time = 23357690826; CPI = 3.3

Memory Level: L1i

Hit Count = 11734181234 Miss Count = 425398952

Total Requests = 12159580186

Hit Rate = 96.5% Miss Rate = 3.5%

Kickouts = 409319349; Dirty kickouts = 0; Transfers = 409319613

VC Hit count = 16079339

Memory Level: L1d

Hit Count = 3895270880 Miss Count = 156676137

Total Requests = 4051947017

Hit Rate = 96.1% Miss Rate = 3.9%

Kickouts = 145063307; Dirty kickouts = 90603197; Transfers = 145063571

VC Hit count = 11612566

Memory Level: L2

Hit Count = 430546692 Miss Count = 214439689

Total Requests = 644986381

Hit Rate = 66.8% Miss Rate = 33.2%

Kickouts = 209189538; Dirty kickouts = 51745463; Transfers = 209190058

VC Hit count = 5249631

L1 cache cost (Icache $400) + (Dcache $400) = $800

L2 cache cost = $200; Memory cost = $75 Total cost = $1075

-------------------------------------------------------------------------

gobmk.All-4way Simulation Results

-------------------------------------------------------------------------

Memory system:

Dcache size = 8192 : ways = 4 : block size = 32

Icache size = 8192 : ways = 4 : block size = 32

L2-cache size = 32768 : ways = 4 : block size = 64

Memory ready time = 50 : chunksize = 8 : chunktime = 15

Execute time = 83531333324; Total refs = 10000000628

Inst refs = 7146163623; Data refs = 2853837005

Number of reference types: [Percentage]

Reads = 1921584739 [19.2%]

Writes = 932252266 [ 9.3%]

Inst. = 7146163623 [71.5%]

Total = 10000000628

Total cycles for activities: [Percentage]

Reads = 14863345345 [17.8%]

Writes = 15099405797 [18.1%]

Inst. = 53568582182 [64.1%]

Total = 83531333324

CPI = 11.7

Ideal: Exec. Time = 17146164251; CPI = 2.4

Ideal mis-aligned: Exec. Time = 23357690826; CPI = 3.3

Memory Level: L1i

Hit Count = 11743083509 Miss Count = 416496677

Total Requests = 12159580186

Hit Rate = 96.6% Miss Rate = 3.4%

Kickouts = 408872203; Dirty kickouts = 0; Transfers = 408872467

VC Hit count = 7624210

Memory Level: L1d

Hit Count = 3919972896 Miss Count = 131974121

Total Requests = 4051947017

Hit Rate = 96.7% Miss Rate = 3.3%

Kickouts = 126261957; Dirty kickouts = 80507672; Transfers = 126262221

VC Hit count = 5711900

Memory Level: L2

Hit Count = 431382038 Miss Count = 184260322

Total Requests = 615642360

Hit Rate = 70.1% Miss Rate = 29.9%

Kickouts = 179227868; Dirty kickouts = 46019292; Transfers = 179228388

VC Hit count = 5031934

L1 cache cost (Icache $600) + (Dcache $600) = $1200

L2 cache cost = $300; Memory cost = $75 Total cost = $1575

-------------------------------------------------------------------------

gobmk.All-FA Simulation Results

-------------------------------------------------------------------------

Memory system:

Dcache size = 8192 : ways = 256 : block size = 32

Icache size = 8192 : ways = 256 : block size = 32

L2-cache size = 32768 : ways = 512 : block size = 64

Memory ready time = 50 : chunksize = 8 : chunktime = 15

Execute time = 77100149273; Total refs = 10000000628

Inst refs = 7146163623; Data refs = 2853837005

Number of reference types: [Percentage]

Reads = 1921584739 [19.2%]

Writes = 932252266 [ 9.3%]

Inst. = 7146163623 [71.5%]

Total = 10000000628

Total cycles for activities: [Percentage]

Reads = 13693199200 [17.8%]

Writes = 15023525602 [19.5%]

Inst. = 48383424471 [62.8%]

Total = 77100149273

CPI = 10.8

Ideal: Exec. Time = 17146164251; CPI = 2.4

Ideal mis-aligned: Exec. Time = 23357690826; CPI = 3.3

Memory Level: L1i

Hit Count = 11743282458 Miss Count = 416297728

Total Requests = 12159580186

Hit Rate = 96.6% Miss Rate = 3.4%

Kickouts = 410857789; Dirty kickouts = 0; Transfers = 410858053

VC Hit count = 5439675

Memory Level: L1d

Hit Count = 3933989664 Miss Count = 117957353

Total Requests = 4051947017

Hit Rate = 97.1% Miss Rate = 2.9%

Kickouts = 115457628; Dirty kickouts = 74259657; Transfers = 115457892

VC Hit count = 2499461

Memory Level: L2

Hit Count = 444563313 Miss Count = 156012289

Total Requests = 600575602

Hit Rate = 74.0% Miss Rate = 26.0%

Kickouts = 152235194; Dirty kickouts = 41275195; Transfers = 152235714

VC Hit count = 3776575

L1 cache cost (Icache $1800) + (Dcache $1800) = $3600

L2 cache cost = $1000; Memory cost = $75 Total cost = $4675

-------------------------------------------------------------------------

gobmk.All-small Simulation Results

-------------------------------------------------------------------------

Memory system:

Dcache size = 4096 : ways = 1 : block size = 32

Icache size = 4096 : ways = 1 : block size = 32

L2-cache size = 16384 : ways = 1 : block size = 64

Memory ready time = 50 : chunksize = 8 : chunktime = 15

Execute time = 148938059328; Total refs = 10000000628

Inst refs = 7146163623; Data refs = 2853837005

Number of reference types: [Percentage]

Reads = 1921584739 [19.2%]

Writes = 932252266 [ 9.3%]

Inst. = 7146163623 [71.5%]

Total = 10000000628

Total cycles for activities: [Percentage]

Reads = 34048330526 [22.9%]

Writes = 23787912214 [16.0%]

Inst. = 91101816588 [61.2%]

Total =148938059328

CPI = 20.8

Ideal: Exec. Time = 17146164251; CPI = 2.4

Ideal mis-aligned: Exec. Time = 23357690826; CPI = 3.3

Memory Level: L1i

Hit Count = 11545777533 Miss Count = 613802653

Total Requests = 12159580186

Hit Rate = 95.0% Miss Rate = 5.0%

Kickouts = 581682891; Dirty kickouts = 0; Transfers = 581683027

VC Hit count = 32119626

Memory Level: L1d

Hit Count = 3733996342 Miss Count = 317950675

Total Requests = 4051947017

Hit Rate = 92.2% Miss Rate = 7.8%

Kickouts = 246020298; Dirty kickouts = 141853497; Transfers = 246020434

VC Hit count = 71930241

Memory Level: L2

Hit Count = 533126775 Miss Count = 436430183

Total Requests = 969556958

Hit Rate = 55.0% Miss Rate = 45.0%

Kickouts = 422519238; Dirty kickouts = 94906712; Transfers = 422519502

VC Hit count = 13910681

L1 cache cost (Icache $100) + (Dcache $100) = $200

L2 cache cost = $50; Memory cost = $75 Total cost = $325

-------------------------------------------------------------------------

gobmk.default Simulation Results

-------------------------------------------------------------------------

Memory system:

Dcache size = 8192 : ways = 1 : block size = 32

Icache size = 8192 : ways = 1 : block size = 32

L2-cache size = 32768 : ways = 1 : block size = 64

Memory ready time = 50 : chunksize = 8 : chunktime = 15

Execute time = 100855222203; Total refs = 10000000628

Inst refs = 7146163623; Data refs = 2853837005

Number of reference types: [Percentage]

Reads = 1921584739 [19.2%]

Writes = 932252266 [ 9.3%]

Inst. = 7146163623 [71.5%]

Total = 10000000628

Total cycles for activities: [Percentage]

Reads = 21249426994 [21.1%]

Writes = 17212820777 [17.1%]

Inst. = 62392974432 [61.9%]

Total =100855222203

CPI = 14.1

Ideal: Exec. Time = 17146164251; CPI = 2.4

Ideal mis-aligned: Exec. Time = 23357690826; CPI = 3.3

Memory Level: L1i

Hit Count = 11708085009 Miss Count = 451495177

Total Requests = 12159580186

Hit Rate = 96.3% Miss Rate = 3.7%

Kickouts = 429513323; Dirty kickouts = 0; Transfers = 429513587

VC Hit count = 21981590

Memory Level: L1d

Hit Count = 3837245587 Miss Count = 214701430

Total Requests = 4051947017

Hit Rate = 94.7% Miss Rate = 5.3%

Kickouts = 172054301; Dirty kickouts = 105609028; Transfers = 172054565

VC Hit count = 42646865

Memory Level: L2

Hit Count = 455069403 Miss Count = 252107777

Total Requests = 707177180

Hit Rate = 64.4% Miss Rate = 35.6%

Kickouts = 242306410; Dirty kickouts = 60522492; Transfers = 242306930

VC Hit count = 9800847

L1 cache cost (Icache $200) + (Dcache $200) = $400

L2 cache cost = $100; Memory cost = $75 Total cost = $575

-------------------------------------------------------------------------

gobmk.L1-2way Simulation Results

-------------------------------------------------------------------------

Memory system:

Dcache size = 8192 : ways = 2 : block size = 32

Icache size = 8192 : ways = 2 : block size = 32

L2-cache size = 32768 : ways = 1 : block size = 64

Memory ready time = 50 : chunksize = 8 : chunktime = 15

Execute time = 96366209773; Total refs = 10000000628

Inst refs = 7146163623; Data refs = 2853837005

Number of reference types: [Percentage]

Reads = 1921584739 [19.2%]

Writes = 932252266 [ 9.3%]

Inst. = 7146163623 [71.5%]

Total = 10000000628

Total cycles for activities: [Percentage]

Reads = 18715919321 [19.4%]

Writes = 16815519867 [17.4%]

Inst. = 60834770585 [63.1%]

Total = 96366209773

CPI = 13.5

Ideal: Exec. Time = 17146164251; CPI = 2.4

Ideal mis-aligned: Exec. Time = 23357690826; CPI = 3.3

Memory Level: L1i

Hit Count = 11734181234 Miss Count = 425398952

Total Requests = 12159580186

Hit Rate = 96.5% Miss Rate = 3.5%

Kickouts = 409319349; Dirty kickouts = 0; Transfers = 409319613

VC Hit count = 16079339

Memory Level: L1d

Hit Count = 3895270880 Miss Count = 156676137

Total Requests = 4051947017

Hit Rate = 96.1% Miss Rate = 3.9%

Kickouts = 145063307; Dirty kickouts = 90603197; Transfers = 145063571

VC Hit count = 11612566

Memory Level: L2

Hit Count = 406468620 Miss Count = 238517761

Total Requests = 644986381

Hit Rate = 63.0% Miss Rate = 37.0%

Kickouts = 232707915; Dirty kickouts = 56078496; Transfers = 232708435

VC Hit count = 5809326

L1 cache cost (Icache $400) + (Dcache $400) = $800

L2 cache cost = $100; Memory cost = $75 Total cost = $975

-------------------------------------------------------------------------

gobmk.L1-8way Simulation Results

-------------------------------------------------------------------------

Memory system:

Dcache size = 8192 : ways = 8 : block size = 32

Icache size = 8192 : ways = 8 : block size = 32

L2-cache size = 32768 : ways = 1 : block size = 64

Memory ready time = 50 : chunksize = 8 : chunktime = 15

Execute time = 90787682371; Total refs = 10000000628

Inst refs = 7146163623; Data refs = 2853837005

Number of reference types: [Percentage]

Reads = 1921584739 [19.2%]

Writes = 932252266 [ 9.3%]

Inst. = 7146163623 [71.5%]

Total = 10000000628

Total cycles for activities: [Percentage]

Reads = 15403593361 [17.0%]

Writes = 15874844369 [17.5%]

Inst. = 59509244641 [65.5%]

Total = 90787682371

CPI = 12.7

Ideal: Exec. Time = 17146164251; CPI = 2.4

Ideal mis-aligned: Exec. Time = 23357690826; CPI = 3.3

Memory Level: L1i

Hit Count = 11743485158 Miss Count = 416095028

Total Requests = 12159580186

Hit Rate = 96.6% Miss Rate = 3.4%

Kickouts = 407983919; Dirty kickouts = 0; Transfers = 407984183

VC Hit count = 8110845

Memory Level: L1d

Hit Count = 3928282406 Miss Count = 123664611

Total Requests = 4051947017

Hit Rate = 96.9% Miss Rate = 3.1%

Kickouts = 119775183; Dirty kickouts = 77066252; Transfers = 119775447

VC Hit count = 3889164

Memory Level: L2

Hit Count = 383914125 Miss Count = 220911757

Total Requests = 604825882

Hit Rate = 63.5% Miss Rate = 36.5%

Kickouts = 217013449; Dirty kickouts = 48241529; Transfers = 217013969

VC Hit count = 3897788

L1 cache cost (Icache $800) + (Dcache $800) = $1600

L2 cache cost = $100; Memory cost = $75 Total cost = $1775

-------------------------------------------------------------------------

gobmk.L1-small Simulation Results

-------------------------------------------------------------------------

Memory system:

Dcache size = 4096 : ways = 1 : block size = 32

Icache size = 4096 : ways = 1 : block size = 32

L2-cache size = 32768 : ways = 1 : block size = 64

Memory ready time = 50 : chunksize = 8 : chunktime = 15

Execute time = 116679259078; Total refs = 10000000628

Inst refs = 7146163623; Data refs = 2853837005

Number of reference types: [Percentage]

Reads = 1921584739 [19.2%]

Writes = 932252266 [ 9.3%]

Inst. = 7146163623 [71.5%]

Total = 10000000628

Total cycles for activities: [Percentage]

Reads = 26101645336 [22.4%]

Writes = 19289948924 [16.5%]

Inst. = 71287664818 [61.1%]

Total =116679259078

CPI = 16.3

Ideal: Exec. Time = 17146164251; CPI = 2.4

Ideal mis-aligned: Exec. Time = 23357690826; CPI = 3.3

Memory Level: L1i

Hit Count = 11545777533 Miss Count = 613802653

Total Requests = 12159580186

Hit Rate = 95.0% Miss Rate = 5.0%

Kickouts = 581682891; Dirty kickouts = 0; Transfers = 581683027

VC Hit count = 32119626

Memory Level: L1d

Hit Count = 3733996342 Miss Count = 317950675

Total Requests = 4051947017

Hit Rate = 92.2% Miss Rate = 7.8%

Kickouts = 246020298; Dirty kickouts = 141853497; Transfers = 246020434

VC Hit count = 71930241

Memory Level: L2

Hit Count = 680346776 Miss Count = 289210182

Total Requests = 969556958

Hit Rate = 70.2% Miss Rate = 29.8%

Kickouts = 275231307; Dirty kickouts = 71157719; Transfers = 275231827

VC Hit count = 13978355

L1 cache cost (Icache $100) + (Dcache $100) = $200

L2 cache cost = $100; Memory cost = $75 Total cost = $375

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gobmk.L1-small-4way Simulation Results

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Memory system:

Dcache size = 4096 : ways = 4 : block size = 32

Icache size = 4096 : ways = 4 : block size = 32

L2-cache size = 32768 : ways = 1 : block size = 64

Memory ready time = 50 : chunksize = 8 : chunktime = 15

Execute time = 111164437425; Total refs = 10000000628

Inst refs = 7146163623; Data refs = 2853837005

Number of reference types: [Percentage]

Reads = 1921584739 [19.2%]

Writes = 932252266 [ 9.3%]

Inst. = 7146163623 [71.5%]

Total = 10000000628

Total cycles for activities: [Percentage]

Reads = 22709779454 [20.4%]

Writes = 19387546707 [17.4%]

Inst. = 69067111264 [62.1%]

Total =111164437425

CPI = 15.6

Ideal: Exec. Time = 17146164251; CPI = 2.4

Ideal mis-aligned: Exec. Time = 23357690826; CPI = 3.3

Memory Level: L1i

Hit Count = 11613499635 Miss Count = 546080551

Total Requests = 12159580186

Hit Rate = 95.5% Miss Rate = 4.5%

Kickouts = 528200732; Dirty kickouts = 0; Transfers = 528200868

VC Hit count = 17879683

Memory Level: L1d

Hit Count = 3840153605 Miss Count = 211793412

Total Requests = 4051947017

Hit Rate = 94.8% Miss Rate = 5.2%

Kickouts = 201658370; Dirty kickouts = 122286013; Transfers = 201658506

VC Hit count = 10134906

Memory Level: L2

Hit Count = 575079363 Miss Count = 277066024

Total Requests = 852145387

Hit Rate = 67.5% Miss Rate = 32.5%

Kickouts = 268818958; Dirty kickouts = 66836864; Transfers = 268819478

VC Hit count = 8246546

L1 cache cost (Icache $300) + (Dcache $300) = $600

L2 cache cost = $100; Memory cost = $75 Total cost = $775

-------------------------------------------------------------------------

libquantum.All-2way Simulation Results

-------------------------------------------------------------------------

Memory system:

Dcache size = 8192 : ways = 2 : block size = 32

Icache size = 8192 : ways = 2 : block size = 32

L2-cache size = 32768 : ways = 2 : block size = 64

Memory ready time = 50 : chunksize = 8 : chunktime = 15

Execute time = 138261563722; Total refs = 16506492546

Inst refs = 12487578510; Data refs = 4018914036

Number of reference types: [Percentage]

Reads = 3526260463 [21.4%]

Writes = 492653573 [ 3.0%]

Inst. = 12487578510 [75.7%]

Total = 16506492546

Total cycles for activities: [Percentage]

Reads =107870165668 [78.0%]

Writes = 1280994626 [ 0.9%]

Inst. = 29110403428 [21.1%]

Total =138261563722

CPI = 11.1

Ideal: Exec. Time = 28994071056; CPI = 2.3

Ideal mis-aligned: Exec. Time = 35948584560; CPI = 2.9

Memory Level: L1i

Hit Count = 16621376882 Miss Count = 12171

Total Requests = 16621389053

Hit Rate = 100.0% Miss Rate = 0.0%

Kickouts = 7184; Dirty kickouts = 0; Transfers = 7448

VC Hit count = 4723

Memory Level: L1d

Hit Count = 6262734512 Miss Count = 576882485

Total Requests = 6839616997

Hit Rate = 91.6% Miss Rate = 8.4%

Kickouts = 576837953; Dirty kickouts = 237725652; Transfers = 576838217

VC Hit count = 44268

Memory Level: L2

Hit Count = 525629688 Miss Count = 288941629

Total Requests = 814571317

Hit Rate = 64.5% Miss Rate = 35.5%

Kickouts = 288903228; Dirty kickouts = 133533315; Transfers = 288903748

VC Hit count = 37881

L1 cache cost (Icache $400) + (Dcache $400) = $800

L2 cache cost = $200; Memory cost = $75 Total cost = $1075

-------------------------------------------------------------------------

libquantum.All-4way Simulation Results

-------------------------------------------------------------------------

Memory system:

Dcache size = 8192 : ways = 4 : block size = 32

Icache size = 8192 : ways = 4 : block size = 32

L2-cache size = 32768 : ways = 4 : block size = 64

Memory ready time = 50 : chunksize = 8 : chunktime = 15

Execute time = 138249947007; Total refs = 16506492546

Inst refs = 12487578510; Data refs = 4018914036

Number of reference types: [Percentage]

Reads = 3526260463 [21.4%]

Writes = 492653573 [ 3.0%]

Inst. = 12487578510 [75.7%]

Total = 16506492546

Total cycles for activities: [Percentage]

Reads =107858685657 [78.0%]

Writes = 1281028655 [ 0.9%]

Inst. = 29110232695 [21.1%]

Total =138249947007

CPI = 11.1

Ideal: Exec. Time = 28994071056; CPI = 2.3

Ideal mis-aligned: Exec. Time = 35948584560; CPI = 2.9

Memory Level: L1i

Hit Count = 16621380615 Miss Count = 8438

Total Requests = 16621389053

Hit Rate = 100.0% Miss Rate = 0.0%

Kickouts = 6389; Dirty kickouts = 0; Transfers = 6653

VC Hit count = 1785

Memory Level: L1d

Hit Count = 6262778660 Miss Count = 576838337

Total Requests = 6839616997

Hit Rate = 91.6% Miss Rate = 8.4%

Kickouts = 576837856; Dirty kickouts = 237725396; Transfers = 576838120

VC Hit count = 217

Memory Level: L2

Hit Count = 525712559 Miss Count = 288857610

Total Requests = 814570169

Hit Rate = 64.5% Miss Rate = 35.5%

Kickouts = 288845649; Dirty kickouts = 133531469; Transfers = 288846169

VC Hit count = 11441

L1 cache cost (Icache $600) + (Dcache $600) = $1200

L2 cache cost = $300; Memory cost = $75 Total cost = $1575

-------------------------------------------------------------------------

libquantum.All-FA Simulation Results

-------------------------------------------------------------------------

Memory system:

Dcache size = 8192 : ways = 256 : block size = 32

Icache size = 8192 : ways = 256 : block size = 32

L2-cache size = 32768 : ways = 512 : block size = 64

Memory ready time = 50 : chunksize = 8 : chunktime = 15

Execute time = 138248028359; Total refs = 16506492546

Inst refs = 12487578510; Data refs = 4018914036

Number of reference types: [Percentage]

Reads = 3526260463 [21.4%]

Writes = 492653573 [ 3.0%]

Inst. = 12487578510 [75.7%]

Total = 16506492546

Total cycles for activities: [Percentage]

Reads =107861475297 [78.0%]

Writes = 1276672179 [ 0.9%]

Inst. = 29109880883 [21.1%]

Total =138248028359

CPI = 11.1

Ideal: Exec. Time = 28994071056; CPI = 2.3

Ideal mis-aligned: Exec. Time = 35948584560; CPI = 2.9

Memory Level: L1i

Hit Count = 16621383227 Miss Count = 5826

Total Requests = 16621389053

Hit Rate = 100.0% Miss Rate = 0.0%

Kickouts = 5054; Dirty kickouts = 0; Transfers = 5318

VC Hit count = 508

Memory Level: L1d

Hit Count = 6262778712 Miss Count = 576838285

Total Requests = 6839616997

Hit Rate = 91.6% Miss Rate = 8.4%

Kickouts = 576837784; Dirty kickouts = 237725270; Transfers = 576838048

VC Hit count = 237

Memory Level: L2

Hit Count = 525731076 Miss Count = 288837560

Total Requests = 814568636

Hit Rate = 64.5% Miss Rate = 35.5%

Kickouts = 288836869; Dirty kickouts = 133530957; Transfers = 288837389

VC Hit count = 171

L1 cache cost (Icache $1800) + (Dcache $1800) = $3600

L2 cache cost = $1000; Memory cost = $75 Total cost = $4675

-------------------------------------------------------------------------

libquantum.All-small Simulation Results

-------------------------------------------------------------------------

Memory system:

Dcache size = 4096 : ways = 1 : block size = 32

Icache size = 4096 : ways = 1 : block size = 32

L2-cache size = 16384 : ways = 1 : block size = 64

Memory ready time = 50 : chunksize = 8 : chunktime = 15

Execute time = 138297748643; Total refs = 16506492546

Inst refs = 12487578510; Data refs = 4018914036

Number of reference types: [Percentage]

Reads = 3526260463 [21.4%]

Writes = 492653573 [ 3.0%]

Inst. = 12487578510 [75.7%]

Total = 16506492546

Total cycles for activities: [Percentage]

Reads =107904967657 [78.0%]

Writes = 1276386378 [ 0.9%]

Inst. = 29116394608 [21.1%]

Total =138297748643

CPI = 11.1

Ideal: Exec. Time = 28994071056; CPI = 2.3

Ideal mis-aligned: Exec. Time = 35948584560; CPI = 2.9

Memory Level: L1i

Hit Count = 16621282284 Miss Count = 106769

Total Requests = 16621389053

Hit Rate = 100.0% Miss Rate = 0.0%

Kickouts = 31651; Dirty kickouts = 0; Transfers = 31787

VC Hit count = 74982

Memory Level: L1d

Hit Count = 6246339741 Miss Count = 593277256

Total Requests = 6839616997

Hit Rate = 91.3% Miss Rate = 8.7%

Kickouts = 576863753; Dirty kickouts = 237729680; Transfers = 576863889

VC Hit count = 16413367

Memory Level: L2

Hit Count = 525194259 Miss Count = 289431097

Total Requests = 814625356

Hit Rate = 64.5% Miss Rate = 35.5%

Kickouts = 288963091; Dirty kickouts = 133547529; Transfers = 288963355

VC Hit count = 467742

L1 cache cost (Icache $100) + (Dcache $100) = $200

L2 cache cost = $50; Memory cost = $75 Total cost = $325

-------------------------------------------------------------------------

libquantum.default Simulation Results

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Memory system:

Dcache size = 8192 : ways = 1 : block size = 32

Icache size = 8192 : ways = 1 : block size = 32

L2-cache size = 32768 : ways = 1 : block size = 64

Memory ready time = 50 : chunksize = 8 : chunktime = 15

Execute time = 138307664954; Total refs = 16506492546

Inst refs = 12487578510; Data refs = 4018914036

Number of reference types: [Percentage]

Reads = 3526260463 [21.4%]

Writes = 492653573 [ 3.0%]

Inst. = 12487578510 [75.7%]

Total = 16506492546

Total cycles for activities: [Percentage]

Reads =107923473243 [78.0%]

Writes = 1272550513 [ 0.9%]

Inst. = 29111641198 [21.0%]

Total =138307664954

CPI = 11.1

Ideal: Exec. Time = 28994071056; CPI = 2.3

Ideal mis-aligned: Exec. Time = 35948584560; CPI = 2.9

Memory Level: L1i

Hit Count = 16621371498 Miss Count = 17555

Total Requests = 16621389053

Hit Rate = 100.0% Miss Rate = 0.0%

Kickouts = 13001; Dirty kickouts = 0; Transfers = 13265

VC Hit count = 4290

Memory Level: L1d

Hit Count = 6253546800 Miss Count = 586070197

Total Requests = 6839616997

Hit Rate = 91.4% Miss Rate = 8.6%

Kickouts = 576852561; Dirty kickouts = 237727424; Transfers = 576852825

VC Hit count = 9217372

Memory Level: L2

Hit Count = 524986509 Miss Count = 289607005

Total Requests = 814593514

Hit Rate = 64.4% Miss Rate = 35.6%

Kickouts = 289058809; Dirty kickouts = 133542361; Transfers = 289059329

VC Hit count = 547676

L1 cache cost (Icache $200) + (Dcache $200) = $400

L2 cache cost = $100; Memory cost = $75 Total cost = $575

-------------------------------------------------------------------------

libquantum.L1-2way Simulation Results

-------------------------------------------------------------------------

Memory system:

Dcache size = 8192 : ways = 2 : block size = 32

Icache size = 8192 : ways = 2 : block size = 32

L2-cache size = 32768 : ways = 1 : block size = 64

Memory ready time = 50 : chunksize = 8 : chunktime = 15

Execute time = 138315739242; Total refs = 16506492546

Inst refs = 12487578510; Data refs = 4018914036

Number of reference types: [Percentage]

Reads = 3526260463 [21.4%]

Writes = 492653573 [ 3.0%]

Inst. = 12487578510 [75.7%]

Total = 16506492546

Total cycles for activities: [Percentage]

Reads =107914515978 [78.0%]

Writes = 1290829516 [ 0.9%]

Inst. = 29110393748 [21.0%]

Total =138315739242

CPI = 11.1

Ideal: Exec. Time = 28994071056; CPI = 2.3

Ideal mis-aligned: Exec. Time = 35948584560; CPI = 2.9

Memory Level: L1i

Hit Count = 16621376882 Miss Count = 12171

Total Requests = 16621389053

Hit Rate = 100.0% Miss Rate = 0.0%

Kickouts = 7184; Dirty kickouts = 0; Transfers = 7448

VC Hit count = 4723

Memory Level: L1d

Hit Count = 6262734512 Miss Count = 576882485

Total Requests = 6839616997

Hit Rate = 91.6% Miss Rate = 8.4%

Kickouts = 576837953; Dirty kickouts = 237725652; Transfers = 576838217

VC Hit count = 44268

Memory Level: L2

Hit Count = 525009154 Miss Count = 289562163

Total Requests = 814571317

Hit Rate = 64.5% Miss Rate = 35.5%

Kickouts = 289159022; Dirty kickouts = 133544022; Transfers = 289159542

VC Hit count = 402621

L1 cache cost (Icache $400) + (Dcache $400) = $800

L2 cache cost = $100; Memory cost = $75 Total cost = $975

-------------------------------------------------------------------------

libquantum.L1-8way Simulation Results

-------------------------------------------------------------------------

Memory system:

Dcache size = 8192 : ways = 8 : block size = 32

Icache size = 8192 : ways = 8 : block size = 32

L2-cache size = 32768 : ways = 1 : block size = 64

Memory ready time = 50 : chunksize = 8 : chunktime = 15

Execute time = 138319542285; Total refs = 16506492546

Inst refs = 12487578510; Data refs = 4018914036

Number of reference types: [Percentage]

Reads = 3526260463 [21.4%]

Writes = 492653573 [ 3.0%]

Inst. = 12487578510 [75.7%]

Total = 16506492546

Total cycles for activities: [Percentage]

Reads =107920187547 [78.0%]

Writes = 1289268611 [ 0.9%]

Inst. = 29110086127 [21.0%]

Total =138319542285

CPI = 11.1

Ideal: Exec. Time = 28994071056; CPI = 2.3

Ideal mis-aligned: Exec. Time = 35948584560; CPI = 2.9

Memory Level: L1i

Hit Count = 16621382623 Miss Count = 6430

Total Requests = 16621389053

Hit Rate = 100.0% Miss Rate = 0.0%

Kickouts = 5749; Dirty kickouts = 0; Transfers = 6013

VC Hit count = 417

Memory Level: L1d

Hit Count = 6262778716 Miss Count = 576838281

Total Requests = 6839616997

Hit Rate = 91.6% Miss Rate = 8.4%

Kickouts = 576837849; Dirty kickouts = 237725332; Transfers = 576838113

VC Hit count = 168

Memory Level: L2

Hit Count = 525022709 Miss Count = 289546749

Total Requests = 814569458

Hit Rate = 64.5% Miss Rate = 35.5%

Kickouts = 289191880; Dirty kickouts = 133533715; Transfers = 289192400

VC Hit count = 354349

L1 cache cost (Icache $800) + (Dcache $800) = $1600

L2 cache cost = $100; Memory cost = $75 Total cost = $1775

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libquantum.L1-small Simulation Results

-------------------------------------------------------------------------

Memory system:

Dcache size = 4096 : ways = 1 : block size = 32

Icache size = 4096 : ways = 1 : block size = 32

L2-cache size = 32768 : ways = 1 : block size = 64

Memory ready time = 50 : chunksize = 8 : chunktime = 15

Execute time = 138278154943; Total refs = 16506492546

Inst refs = 12487578510; Data refs = 4018914036

Number of reference types: [Percentage]

Reads = 3526260463 [21.4%]

Writes = 492653573 [ 3.0%]

Inst. = 12487578510 [75.7%]

Total = 16506492546

Total cycles for activities: [Percentage]

Reads =107888959367 [78.0%]

Writes = 1272785168 [ 0.9%]

Inst. = 29116410408 [21.1%]

Total =138278154943

CPI = 11.1

Ideal: Exec. Time = 28994071056; CPI = 2.3

Ideal mis-aligned: Exec. Time = 35948584560; CPI = 2.9

Memory Level: L1i

Hit Count = 16621282284 Miss Count = 106769

Total Requests = 16621389053

Hit Rate = 100.0% Miss Rate = 0.0%

Kickouts = 31651; Dirty kickouts = 0; Transfers = 31787

VC Hit count = 74982

Memory Level: L1d

Hit Count = 6246339741 Miss Count = 593277256

Total Requests = 6839616997

Hit Rate = 91.3% Miss Rate = 8.7%

Kickouts = 576863753; Dirty kickouts = 237729680; Transfers = 576863889

VC Hit count = 16413367

Memory Level: L2

Hit Count = 525338563 Miss Count = 289286793

Total Requests = 814625356

Hit Rate = 64.5% Miss Rate = 35.5%

Kickouts = 288874864; Dirty kickouts = 133534663; Transfers = 288875384

VC Hit count = 411409

L1 cache cost (Icache $100) + (Dcache $100) = $200

L2 cache cost = $100; Memory cost = $75 Total cost = $375

-------------------------------------------------------------------------

libquantum.L1-small-4way Simulation Results

-------------------------------------------------------------------------

Memory system:

Dcache size = 4096 : ways = 4 : block size = 32

Icache size = 4096 : ways = 4 : block size = 32

L2-cache size = 32768 : ways = 1 : block size = 64

Memory ready time = 50 : chunksize = 8 : chunktime = 15

Execute time = 138279697471; Total refs = 16506492546

Inst refs = 12487578510; Data refs = 4018914036

Number of reference types: [Percentage]

Reads = 3526260463 [21.4%]

Writes = 492653573 [ 3.0%]

Inst. = 12487578510 [75.7%]

Total = 16506492546

Total cycles for activities: [Percentage]

Reads =107876228024 [78.0%]

Writes = 1290156787 [ 0.9%]

Inst. = 29113312660 [21.1%]

Total =138279697471

CPI = 11.1

Ideal: Exec. Time = 28994071056; CPI = 2.3

Ideal mis-aligned: Exec. Time = 35948584560; CPI = 2.9

Memory Level: L1i

Hit Count = 16621364736 Miss Count = 24317

Total Requests = 16621389053

Hit Rate = 100.0% Miss Rate = 0.0%

Kickouts = 18519; Dirty kickouts = 0; Transfers = 18655

VC Hit count = 5662

Memory Level: L1d

Hit Count = 6262759871 Miss Count = 576857126

Total Requests = 6839616997

Hit Rate = 91.6% Miss Rate = 8.4%

Kickouts = 576855191; Dirty kickouts = 237726434; Transfers = 576855327

VC Hit count = 1799

Memory Level: L2

Hit Count = 525322638 Miss Count = 289277778

Total Requests = 814600416

Hit Rate = 64.5% Miss Rate = 35.5%

Kickouts = 288971961; Dirty kickouts = 133542197; Transfers = 288972481

VC Hit count = 305297

L1 cache cost (Icache $300) + (Dcache $300) = $600

L2 cache cost = $100; Memory cost = $75 Total cost = $775

-------------------------------------------------------------------------

omnetpp.All-2way Simulation Results

-------------------------------------------------------------------------

Memory system:

Dcache size = 8192 : ways = 2 : block size = 32

Icache size = 8192 : ways = 2 : block size = 32

L2-cache size = 32768 : ways = 2 : block size = 64

Memory ready time = 50 : chunksize = 8 : chunktime = 15

Execute time = 97670412128; Total refs = 10000000913

Inst refs = 6748282688; Data refs = 3251718225

Number of reference types: [Percentage]

Reads = 2012001894 [20.1%]

Writes = 1239716331 [12.4%]

Inst. = 6748282688 [67.5%]

Total = 10000000913

Total cycles for activities: [Percentage]

Reads = 42652194785 [43.7%]

Writes = 9028294283 [ 9.2%]

Inst. = 45989923060 [47.1%]

Total = 97670412128

CPI = 14.5

Ideal: Exec. Time = 16748283601; CPI = 2.5

Ideal mis-aligned: Exec. Time = 24145878430; CPI = 3.6

Memory Level: L1i

Hit Count = 11118904476 Miss Count = 340257755

Total Requests = 11459162231

Hit Rate = 97.0% Miss Rate = 3.0%

Kickouts = 303109003; Dirty kickouts = 0; Transfers = 303109267

VC Hit count = 37148488

Memory Level: L1d

Hit Count = 5674968538 Miss Count = 263464973

Total Requests = 5938433511

Hit Rate = 95.6% Miss Rate = 4.4%

Kickouts = 241917926; Dirty kickouts = 97041173; Transfers = 241918190

VC Hit count = 21546783

Memory Level: L2

Hit Count = 393553105 Miss Count = 248515525

Total Requests = 642068630

Hit Rate = 61.3% Miss Rate = 38.7%

Kickouts = 234813094; Dirty kickouts = 56618242; Transfers = 234813614

VC Hit count = 13701911

L1 cache cost (Icache $400) + (Dcache $400) = $800

L2 cache cost = $200; Memory cost = $75 Total cost = $1075

-------------------------------------------------------------------------

omnetpp.All-4way Simulation Results

-------------------------------------------------------------------------

Memory system:

Dcache size = 8192 : ways = 4 : block size = 32

Icache size = 8192 : ways = 4 : block size = 32

L2-cache size = 32768 : ways = 4 : block size = 64

Memory ready time = 50 : chunksize = 8 : chunktime = 15

Execute time = 85553398132; Total refs = 10000000913

Inst refs = 6748282688; Data refs = 3251718225

Number of reference types: [Percentage]

Reads = 2012001894 [20.1%]

Writes = 1239716331 [12.4%]

Inst. = 6748282688 [67.5%]

Total = 10000000913

Total cycles for activities: [Percentage]

Reads = 37922183737 [44.3%]

Writes = 8521351154 [10.0%]

Inst. = 39109863241 [45.7%]

Total = 85553398132

CPI = 12.7

Ideal: Exec. Time = 16748283601; CPI = 2.5

Ideal mis-aligned: Exec. Time = 24145878430; CPI = 3.6

Memory Level: L1i

Hit Count = 11172290683 Miss Count = 286871548

Total Requests = 11459162231

Hit Rate = 97.5% Miss Rate = 2.5%

Kickouts = 226955754; Dirty kickouts = 0; Transfers = 226956018

VC Hit count = 59915530

Memory Level: L1d

Hit Count = 5715811077 Miss Count = 222622434

Total Requests = 5938433511

Hit Rate = 96.3% Miss Rate = 3.7%

Kickouts = 208418189; Dirty kickouts = 82285844; Transfers = 208418453

VC Hit count = 14203981

Memory Level: L2

Hit Count = 314561433 Miss Count = 203098882

Total Requests = 517660315

Hit Rate = 60.8% Miss Rate = 39.2%

Kickouts = 196001208; Dirty kickouts = 50512428; Transfers = 196001728

VC Hit count = 7097154

L1 cache cost (Icache $600) + (Dcache $600) = $1200

L2 cache cost = $300; Memory cost = $75 Total cost = $1575

-------------------------------------------------------------------------

omnetpp.All-FA Simulation Results

-------------------------------------------------------------------------

Memory system:

Dcache size = 8192 : ways = 256 : block size = 32

Icache size = 8192 : ways = 256 : block size = 32

L2-cache size = 32768 : ways = 512 : block size = 64

Memory ready time = 50 : chunksize = 8 : chunktime = 15

Execute time = 77007111629; Total refs = 10000000913

Inst refs = 6748282688; Data refs = 3251718225

Number of reference types: [Percentage]

Reads = 2012001894 [20.1%]

Writes = 1239716331 [12.4%]

Inst. = 6748282688 [67.5%]

Total = 10000000913

Total cycles for activities: [Percentage]

Reads = 33449862713 [43.4%]

Writes = 8144959406 [10.6%]

Inst. = 35412289510 [46.0%]

Total = 77007111629

CPI = 11.4

Ideal: Exec. Time = 16748283601; CPI = 2.5

Ideal mis-aligned: Exec. Time = 24145878430; CPI = 3.6

Memory Level: L1i

Hit Count = 11254252558 Miss Count = 204909673

Total Requests = 11459162231

Hit Rate = 98.2% Miss Rate = 1.8%

Kickouts = 189929492; Dirty kickouts = 0; Transfers = 189929756

VC Hit count = 14979917

Memory Level: L1d

Hit Count = 5757558159 Miss Count = 180875352

Total Requests = 5938433511

Hit Rate = 97.0% Miss Rate = 3.0%

Kickouts = 179068432; Dirty kickouts = 73717066; Transfers = 179068696

VC Hit count = 1806656

Memory Level: L2

Hit Count = 273601625 Miss Count = 169113893

Total Requests = 442715518

Hit Rate = 61.8% Miss Rate = 38.2%

Kickouts = 167226327; Dirty kickouts = 46041346; Transfers = 167226847

VC Hit count = 1887046

L1 cache cost (Icache $1800) + (Dcache $1800) = $3600

L2 cache cost = $1000; Memory cost = $75 Total cost = $4675

-------------------------------------------------------------------------

omnetpp.All-small Simulation Results

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Memory system:

Dcache size = 4096 : ways = 1 : block size = 32

Icache size = 4096 : ways = 1 : block size = 32

L2-cache size = 16384 : ways = 1 : block size = 64

Memory ready time = 50 : chunksize = 8 : chunktime = 15

Execute time = 195788892557; Total refs = 10000000913

Inst refs = 6748282688; Data refs = 3251718225

Number of reference types: [Percentage]

Reads = 2012001894 [20.1%]

Writes = 1239716331 [12.4%]

Inst. = 6748282688 [67.5%]

Total = 10000000913

Total cycles for activities: [Percentage]

Reads = 82618782936 [42.2%]

Writes = 14942804433 [ 7.6%]

Inst. = 98227305188 [50.2%]

Total =195788892557

CPI = 29.0

Ideal: Exec. Time = 16748283601; CPI = 2.5

Ideal mis-aligned: Exec. Time = 24145878430; CPI = 3.6

Memory Level: L1i

Hit Count = 10787088688 Miss Count = 672073543

Total Requests = 11459162231

Hit Rate = 94.1% Miss Rate = 5.9%

Kickouts = 632913461; Dirty kickouts = 0; Transfers = 632913597

VC Hit count = 39159946

Memory Level: L1d

Hit Count = 5430872993 Miss Count = 507560518

Total Requests = 5938433511

Hit Rate = 91.5% Miss Rate = 8.5%

Kickouts = 428758067; Dirty kickouts = 181205877; Transfers = 428758203

VC Hit count = 78802315

Memory Level: L2

Hit Count = 619689730 Miss Count = 623187947

Total Requests = 1242877677

Hit Rate = 49.9% Miss Rate = 50.1%

Kickouts = 594658876; Dirty kickouts = 124401558; Transfers = 594659140

VC Hit count = 28528807

L1 cache cost (Icache $100) + (Dcache $100) = $200

L2 cache cost = $50; Memory cost = $75 Total cost = $325

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omnetpp.default Simulation Results

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Memory system:

Dcache size = 8192 : ways = 1 : block size = 32

Icache size = 8192 : ways = 1 : block size = 32

L2-cache size = 32768 : ways = 1 : block size = 64

Memory ready time = 50 : chunksize = 8 : chunktime = 15

Execute time = 120981145371; Total refs = 10000000913

Inst refs = 6748282688; Data refs = 3251718225

Number of reference types: [Percentage]

Reads = 2012001894 [20.1%]

Writes = 1239716331 [12.4%]

Inst. = 6748282688 [67.5%]

Total = 10000000913

Total cycles for activities: [Percentage]

Reads = 51828382023 [42.8%]

Writes = 10214008258 [ 8.4%]

Inst. = 58938755090 [48.7%]

Total =120981145371

CPI = 17.9

Ideal: Exec. Time = 16748283601; CPI = 2.5

Ideal mis-aligned: Exec. Time = 24145878430; CPI = 3.6

Memory Level: L1i

Hit Count = 11001944170 Miss Count = 457218061

Total Requests = 11459162231

Hit Rate = 96.0% Miss Rate = 4.0%

Kickouts = 411462916; Dirty kickouts = 0; Transfers = 411463180

VC Hit count = 45754881

Memory Level: L1d

Hit Count = 5568268231 Miss Count = 370165280

Total Requests = 5938433511

Hit Rate = 93.8% Miss Rate = 6.2%

Kickouts = 310498771; Dirty kickouts = 135067550; Transfers = 310499035

VC Hit count = 59666245

Memory Level: L2

Hit Count = 524507109 Miss Count = 332522656

Total Requests = 857029765

Hit Rate = 61.2% Miss Rate = 38.8%

Kickouts = 312030542; Dirty kickouts = 69556847; Transfers = 312031062

VC Hit count = 20491594

L1 cache cost (Icache $200) + (Dcache $200) = $400

L2 cache cost = $100; Memory cost = $75 Total cost = $575

-------------------------------------------------------------------------

omnetpp.L1-2way Simulation Results

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Memory system:

Dcache size = 8192 : ways = 2 : block size = 32

Icache size = 8192 : ways = 2 : block size = 32

L2-cache size = 32768 : ways = 1 : block size = 64

Memory ready time = 50 : chunksize = 8 : chunktime = 15

Execute time = 104823212948; Total refs = 10000000913

Inst refs = 6748282688; Data refs = 3251718225

Number of reference types: [Percentage]

Reads = 2012001894 [20.1%]

Writes = 1239716331 [12.4%]

Inst. = 6748282688 [67.5%]

Total = 10000000913

Total cycles for activities: [Percentage]

Reads = 45242835315 [43.2%]

Writes = 9447722683 [ 9.0%]

Inst. = 50132654950 [47.8%]

Total =104823212948

CPI = 15.5

Ideal: Exec. Time = 16748283601; CPI = 2.5

Ideal mis-aligned: Exec. Time = 24145878430; CPI = 3.6

Memory Level: L1i

Hit Count = 11118904476 Miss Count = 340257755

Total Requests = 11459162231

Hit Rate = 97.0% Miss Rate = 3.0%

Kickouts = 303109003; Dirty kickouts = 0; Transfers = 303109267

VC Hit count = 37148488

Memory Level: L1d

Hit Count = 5674968538 Miss Count = 263464973

Total Requests = 5938433511

Hit Rate = 95.6% Miss Rate = 4.4%

Kickouts = 241917926; Dirty kickouts = 97041173; Transfers = 241918190

VC Hit count = 21546783

Memory Level: L2

Hit Count = 363380347 Miss Count = 278688283

Total Requests = 642068630

Hit Rate = 56.6% Miss Rate = 43.4%

Kickouts = 268295016; Dirty kickouts = 61197838; Transfers = 268295536

VC Hit count = 10392747

L1 cache cost (Icache $400) + (Dcache $400) = $800

L2 cache cost = $100; Memory cost = $75 Total cost = $975

-------------------------------------------------------------------------

omnetpp.L1-8way Simulation Results

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Memory system:

Dcache size = 8192 : ways = 8 : block size = 32

Icache size = 8192 : ways = 8 : block size = 32

L2-cache size = 32768 : ways = 1 : block size = 64

Memory ready time = 50 : chunksize = 8 : chunktime = 15

Execute time = 90288143876; Total refs = 10000000913

Inst refs = 6748282688; Data refs = 3251718225

Number of reference types: [Percentage]

Reads = 2012001894 [20.1%]

Writes = 1239716331 [12.4%]

Inst. = 6748282688 [67.5%]

Total = 10000000913

Total cycles for activities: [Percentage]

Reads = 39029613281 [43.2%]

Writes = 9106978991 [10.1%]

Inst. = 42151551604 [46.7%]

Total = 90288143876

CPI = 13.4

Ideal: Exec. Time = 16748283601; CPI = 2.5

Ideal mis-aligned: Exec. Time = 24145878430; CPI = 3.6

Memory Level: L1i

Hit Count = 11196293866 Miss Count = 262868365

Total Requests = 11459162231

Hit Rate = 97.7% Miss Rate = 2.3%

Kickouts = 208082061; Dirty kickouts = 0; Transfers = 208082325

VC Hit count = 54786040

Memory Level: L1d

Hit Count = 5739490068 Miss Count = 198943443

Total Requests = 5938433511

Hit Rate = 96.6% Miss Rate = 3.4%

Kickouts = 191470956; Dirty kickouts = 77179796; Transfers = 191471220

VC Hit count = 7472223

Memory Level: L2

Hit Count = 247986832 Miss Count = 228746509

Total Requests = 476733341

Hit Rate = 52.0% Miss Rate = 48.0%

Kickouts = 224780583; Dirty kickouts = 53243647; Transfers = 224781103

VC Hit count = 3965406

L1 cache cost (Icache $800) + (Dcache $800) = $1600

L2 cache cost = $100; Memory cost = $75 Total cost = $1775

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omnetpp.L1-small Simulation Results

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Memory system:

Dcache size = 4096 : ways = 1 : block size = 32

Icache size = 4096 : ways = 1 : block size = 32

L2-cache size = 32768 : ways = 1 : block size = 64

Memory ready time = 50 : chunksize = 8 : chunktime = 15

Execute time = 144593654457; Total refs = 10000000913

Inst refs = 6748282688; Data refs = 3251718225

Number of reference types: [Percentage]

Reads = 2012001894 [20.1%]

Writes = 1239716331 [12.4%]

Inst. = 6748282688 [67.5%]

Total = 10000000913

Total cycles for activities: [Percentage]

Reads = 60414485056 [41.8%]

Writes = 11333834553 [ 7.8%]

Inst. = 72845334848 [50.4%]

Total =144593654457

CPI = 21.4

Ideal: Exec. Time = 16748283601; CPI = 2.5

Ideal mis-aligned: Exec. Time = 24145878430; CPI = 3.6

Memory Level: L1i

Hit Count = 10787088688 Miss Count = 672073543

Total Requests = 11459162231

Hit Rate = 94.1% Miss Rate = 5.9%

Kickouts = 632913461; Dirty kickouts = 0; Transfers = 632913597

VC Hit count = 39159946

Memory Level: L1d

Hit Count = 5430872993 Miss Count = 507560518

Total Requests = 5938433511

Hit Rate = 91.5% Miss Rate = 8.5%

Kickouts = 428758067; Dirty kickouts = 181205877; Transfers = 428758203

VC Hit count = 78802315

Memory Level: L2

Hit Count = 845952798 Miss Count = 396924879

Total Requests = 1242877677

Hit Rate = 68.1% Miss Rate = 31.9%

Kickouts = 370421868; Dirty kickouts = 76790491; Transfers = 370422388

VC Hit count = 26502491

L1 cache cost (Icache $100) + (Dcache $100) = $200

L2 cache cost = $100; Memory cost = $75 Total cost = $375

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omnetpp.L1-small-4way Simulation Results

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Memory system:

Dcache size = 4096 : ways = 4 : block size = 32

Icache size = 4096 : ways = 4 : block size = 32

L2-cache size = 32768 : ways = 1 : block size = 64

Memory ready time = 50 : chunksize = 8 : chunktime = 15

Execute time = 135840464412; Total refs = 10000000913

Inst refs = 6748282688; Data refs = 3251718225

Number of reference types: [Percentage]

Reads = 2012001894 [20.1%]

Writes = 1239716331 [12.4%]

Inst. = 6748282688 [67.5%]

Total = 10000000913

Total cycles for activities: [Percentage]

Reads = 54385528500 [40.0%]

Writes = 10394812197 [ 7.7%]

Inst. = 71060123715 [52.3%]

Total =135840464412

CPI = 20.1

Ideal: Exec. Time = 16748283601; CPI = 2.5

Ideal mis-aligned: Exec. Time = 24145878430; CPI = 3.6

Memory Level: L1i

Hit Count = 10796713031 Miss Count = 662449200

Total Requests = 11459162231

Hit Rate = 94.2% Miss Rate = 5.8%

Kickouts = 625743756; Dirty kickouts = 0; Transfers = 625743892

VC Hit count = 36705308

Memory Level: L1d

Hit Count = 5576768211 Miss Count = 361665300

Total Requests = 5938433511

Hit Rate = 93.9% Miss Rate = 6.1%

Kickouts = 335244705; Dirty kickouts = 127146836; Transfers = 335244841

VC Hit count = 26420459

Memory Level: L2

Hit Count = 718947978 Miss Count = 369187591

Total Requests = 1088135569

Hit Rate = 66.1% Miss Rate = 33.9%

Kickouts = 354196103; Dirty kickouts = 70863375; Transfers = 354196623

VC Hit count = 14990968

L1 cache cost (Icache $300) + (Dcache $300) = $600

L2 cache cost = $100; Memory cost = $75 Total cost = $775

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sjeng.All-2way Simulation Results

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Memory system:

Dcache size = 8192 : ways = 2 : block size = 32

Icache size = 8192 : ways = 2 : block size = 32

L2-cache size = 32768 : ways = 2 : block size = 64

Memory ready time = 50 : chunksize = 8 : chunktime = 15

Execute time = 95029042658; Total refs = 17300001933

Inst refs = 12741056222; Data refs = 4558945711

Number of reference types: [Percentage]

Reads = 3299993836 [19.1%]

Writes = 1258951875 [ 7.3%]

Inst. = 12741056222 [73.6%]

Total = 17300001933

Total cycles for activities: [Percentage]

Reads = 20486721843 [21.6%]

Writes = 13316370331 [14.0%]

Inst. = 61225950484 [64.4%]

Total = 95029042658

CPI = 7.5

Ideal: Exec. Time = 30041058155; CPI = 2.4

Ideal mis-aligned: Exec. Time = 40161444400; CPI = 3.2

Memory Level: L1i

Hit Count = 21334634694 Miss Count = 380922410

Total Requests = 21715557104

Hit Rate = 98.2% Miss Rate = 1.8%

Kickouts = 358005322; Dirty kickouts = 0; Transfers = 358005586

VC Hit count = 22916824

Memory Level: L1d

Hit Count = 5498545462 Miss Count = 206285612

Total Requests = 5704831074

Hit Rate = 96.4% Miss Rate = 3.6%

Kickouts = 175673830; Dirty kickouts = 83889252; Transfers = 175674094

VC Hit count = 30611518

Memory Level: L2

Hit Count = 450372832 Miss Count = 167196100

Total Requests = 617568932

Hit Rate = 72.9% Miss Rate = 27.1%

Kickouts = 156243019; Dirty kickouts = 39959234; Transfers = 156243539

VC Hit count = 10952561

L1 cache cost (Icache $400) + (Dcache $400) = $800

L2 cache cost = $200; Memory cost = $75 Total cost = $1075

-------------------------------------------------------------------------

sjeng.All-4way Simulation Results

-------------------------------------------------------------------------

Memory system:

Dcache size = 8192 : ways = 4 : block size = 32

Icache size = 8192 : ways = 4 : block size = 32

L2-cache size = 32768 : ways = 4 : block size = 64

Memory ready time = 50 : chunksize = 8 : chunktime = 15

Execute time = 87293550795; Total refs = 17300001933

Inst refs = 12741056222; Data refs = 4558945711

Number of reference types: [Percentage]

Reads = 3299993836 [19.1%]

Writes = 1258951875 [ 7.3%]

Inst. = 12741056222 [73.6%]

Total = 17300001933

Total cycles for activities: [Percentage]

Reads = 18299325841 [21.0%]

Writes = 12041669340 [13.8%]

Inst. = 56952555614 [65.2%]

Total = 87293550795

CPI = 6.9

Ideal: Exec. Time = 30041058155; CPI = 2.4

Ideal mis-aligned: Exec. Time = 40161444400; CPI = 3.2

Memory Level: L1i

Hit Count = 21340884702 Miss Count = 374672402

Total Requests = 21715557104

Hit Rate = 98.3% Miss Rate = 1.7%

Kickouts = 362363343; Dirty kickouts = 0; Transfers = 362363607

VC Hit count = 12308795

Memory Level: L1d

Hit Count = 5540978435 Miss Count = 163852639

Total Requests = 5704831074

Hit Rate = 97.1% Miss Rate = 2.9%

Kickouts = 149960858; Dirty kickouts = 73387309; Transfers = 149961122

VC Hit count = 13891517

Memory Level: L2

Hit Count = 450952387 Miss Count = 134759651

Total Requests = 585712038

Hit Rate = 77.0% Miss Rate = 23.0%

Kickouts = 124826824; Dirty kickouts = 35428477; Transfers = 124827344

VC Hit count = 9932307

L1 cache cost (Icache $600) + (Dcache $600) = $1200

L2 cache cost = $300; Memory cost = $75 Total cost = $1575

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sjeng.All-FA Simulation Results

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Memory system:

Dcache size = 8192 : ways = 256 : block size = 32

Icache size = 8192 : ways = 256 : block size = 32

L2-cache size = 32768 : ways = 512 : block size = 64

Memory ready time = 50 : chunksize = 8 : chunktime = 15

Execute time = 77103508917; Total refs = 17300001933

Inst refs = 12741056222; Data refs = 4558945711

Number of reference types: [Percentage]

Reads = 3299993836 [19.1%]

Writes = 1258951875 [ 7.3%]

Inst. = 12741056222 [73.6%]

Total = 17300001933

Total cycles for activities: [Percentage]

Reads = 13790677927 [17.9%]

Writes = 10508262236 [13.6%]

Inst. = 52804568754 [68.5%]

Total = 77103508917

CPI = 6.1

Ideal: Exec. Time = 30041058155; CPI = 2.4

Ideal mis-aligned: Exec. Time = 40161444400; CPI = 3.2

Memory Level: L1i

Hit Count = 21292857690 Miss Count = 422699414

Total Requests = 21715557104

Hit Rate = 98.1% Miss Rate = 1.9%

Kickouts = 409046754; Dirty kickouts = 0; Transfers = 409047018

VC Hit count = 13652396

Memory Level: L1d

Hit Count = 5588462471 Miss Count = 116368603

Total Requests = 5704831074

Hit Rate = 98.0% Miss Rate = 2.0%

Kickouts = 111721718; Dirty kickouts = 62636980; Transfers = 111721982

VC Hit count = 4646621

Memory Level: L2

Hit Count = 500077372 Miss Count = 83328608

Total Requests = 583405980

Hit Rate = 85.7% Miss Rate = 14.3%

Kickouts = 80455641; Dirty kickouts = 26401300; Transfers = 80456161

VC Hit count = 2872447

L1 cache cost (Icache $1800) + (Dcache $1800) = $3600

L2 cache cost = $1000; Memory cost = $75 Total cost = $4675

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sjeng.All-small Simulation Results

-------------------------------------------------------------------------

Memory system:

Dcache size = 4096 : ways = 1 : block size = 32

Icache size = 4096 : ways = 1 : block size = 32

L2-cache size = 16384 : ways = 1 : block size = 64

Memory ready time = 50 : chunksize = 8 : chunktime = 15

Execute time = 169275345018; Total refs = 17300001933

Inst refs = 12741056222; Data refs = 4558945711

Number of reference types: [Percentage]

Reads = 3299993836 [19.1%]

Writes = 1258951875 [ 7.3%]

Inst. = 12741056222 [73.6%]

Total = 17300001933

Total cycles for activities: [Percentage]

Reads = 49538588785 [29.3%]

Writes = 19932476206 [11.8%]

Inst. = 99804280027 [59.0%]

Total =169275345018

CPI = 13.3

Ideal: Exec. Time = 30041058155; CPI = 2.4

Ideal mis-aligned: Exec. Time = 40161444400; CPI = 3.2

Memory Level: L1i

Hit Count = 21080519103 Miss Count = 635038001

Total Requests = 21715557104

Hit Rate = 97.1% Miss Rate = 2.9%

Kickouts = 579198944; Dirty kickouts = 0; Transfers = 579199080

VC Hit count = 55838921

Memory Level: L1d

Hit Count = 5144935625 Miss Count = 559895449

Total Requests = 5704831074

Hit Rate = 90.2% Miss Rate = 9.8%

Kickouts = 387909946; Dirty kickouts = 147202554; Transfers = 387910082

VC Hit count = 171985367

Memory Level: L2

Hit Count = 657481388 Miss Count = 456830328

Total Requests = 1114311716

Hit Rate = 59.0% Miss Rate = 41.0%

Kickouts = 430071584; Dirty kickouts = 81872240; Transfers = 430071848

VC Hit count = 26758480

L1 cache cost (Icache $100) + (Dcache $100) = $200

L2 cache cost = $50; Memory cost = $75 Total cost = $325

-------------------------------------------------------------------------

sjeng.default Simulation Results

-------------------------------------------------------------------------

Memory system:

Dcache size = 8192 : ways = 1 : block size = 32

Icache size = 8192 : ways = 1 : block size = 32

L2-cache size = 32768 : ways = 1 : block size = 64

Memory ready time = 50 : chunksize = 8 : chunktime = 15

Execute time = 106335247059; Total refs = 17300001933

Inst refs = 12741056222; Data refs = 4558945711

Number of reference types: [Percentage]

Reads = 3299993836 [19.1%]

Writes = 1258951875 [ 7.3%]

Inst. = 12741056222 [73.6%]

Total = 17300001933

Total cycles for activities: [Percentage]

Reads = 25430426927 [23.9%]

Writes = 13905815484 [13.1%]

Inst. = 66999004648 [63.0%]

Total =106335247059

CPI = 8.3

Ideal: Exec. Time = 30041058155; CPI = 2.4

Ideal mis-aligned: Exec. Time = 40161444400; CPI = 3.2

Memory Level: L1i

Hit Count = 21310647762 Miss Count = 404909342

Total Requests = 21715557104

Hit Rate = 98.1% Miss Rate = 1.9%

Kickouts = 373687626; Dirty kickouts = 0; Transfers = 373687890

VC Hit count = 31221452

Memory Level: L1d

Hit Count = 5381411277 Miss Count = 323419797

Total Requests = 5704831074

Hit Rate = 94.3% Miss Rate = 5.7%

Kickouts = 227161103; Dirty kickouts = 99092298; Transfers = 227161367

VC Hit count = 96258430

Memory Level: L2

Hit Count = 485941759 Miss Count = 213999796

Total Requests = 699941555

Hit Rate = 69.4% Miss Rate = 30.6%

Kickouts = 198648199; Dirty kickouts = 44168570; Transfers = 198648719

VC Hit count = 15351077

L1 cache cost (Icache $200) + (Dcache $200) = $400

L2 cache cost = $100; Memory cost = $75 Total cost = $575

-------------------------------------------------------------------------

sjeng.L1-2way Simulation Results

-------------------------------------------------------------------------

Memory system:

Dcache size = 8192 : ways = 2 : block size = 32

Icache size = 8192 : ways = 2 : block size = 32

L2-cache size = 32768 : ways = 1 : block size = 64

Memory ready time = 50 : chunksize = 8 : chunktime = 15

Execute time = 100481092118; Total refs = 17300001933

Inst refs = 12741056222; Data refs = 4558945711

Number of reference types: [Percentage]

Reads = 3299993836 [19.1%]

Writes = 1258951875 [ 7.3%]

Inst. = 12741056222 [73.6%]

Total = 17300001933

Total cycles for activities: [Percentage]

Reads = 22463072463 [22.4%]

Writes = 13384162211 [13.3%]

Inst. = 64633857444 [64.3%]

Total =100481092118

CPI = 7.9

Ideal: Exec. Time = 30041058155; CPI = 2.4

Ideal mis-aligned: Exec. Time = 40161444400; CPI = 3.2

Memory Level: L1i

Hit Count = 21334634694 Miss Count = 380922410

Total Requests = 21715557104

Hit Rate = 98.2% Miss Rate = 1.8%

Kickouts = 358005322; Dirty kickouts = 0; Transfers = 358005586

VC Hit count = 22916824

Memory Level: L1d

Hit Count = 5498545462 Miss Count = 206285612

Total Requests = 5704831074

Hit Rate = 96.4% Miss Rate = 3.6%

Kickouts = 175673830; Dirty kickouts = 83889252; Transfers = 175674094

VC Hit count = 30611518

Memory Level: L2

Hit Count = 425560576 Miss Count = 192008356

Total Requests = 617568932

Hit Rate = 68.9% Miss Rate = 31.1%

Kickouts = 182812837; Dirty kickouts = 42300121; Transfers = 182813357

VC Hit count = 9194999

L1 cache cost (Icache $400) + (Dcache $400) = $800

L2 cache cost = $100; Memory cost = $75 Total cost = $975

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sjeng.L1-8way Simulation Results

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Memory system:

Dcache size = 8192 : ways = 8 : block size = 32

Icache size = 8192 : ways = 8 : block size = 32

L2-cache size = 32768 : ways = 1 : block size = 64

Memory ready time = 50 : chunksize = 8 : chunktime = 15

Execute time = 94235208548; Total refs = 17300001933

Inst refs = 12741056222; Data refs = 4558945711

Number of reference types: [Percentage]

Reads = 3299993836 [19.1%]

Writes = 1258951875 [ 7.3%]

Inst. = 12741056222 [73.6%]

Total = 17300001933

Total cycles for activities: [Percentage]

Reads = 18521036838 [19.7%]

Writes = 12244994665 [13.0%]

Inst. = 63469177045 [67.4%]

Total = 94235208548

CPI = 7.4

Ideal: Exec. Time = 30041058155; CPI = 2.4

Ideal mis-aligned: Exec. Time = 40161444400; CPI = 3.2

Memory Level: L1i

Hit Count = 21328712269 Miss Count = 386844835

Total Requests = 21715557104

Hit Rate = 98.2% Miss Rate = 1.8%

Kickouts = 373949989; Dirty kickouts = 0; Transfers = 373950253

VC Hit count = 12894582

Memory Level: L1d

Hit Count = 5565356345 Miss Count = 139474729

Total Requests = 5704831074

Hit Rate = 97.6% Miss Rate = 2.4%

Kickouts = 127491962; Dirty kickouts = 65378544; Transfers = 127492226

VC Hit count = 11982503

Memory Level: L2

Hit Count = 397789393 Miss Count = 169031630

Total Requests = 566821023

Hit Rate = 70.2% Miss Rate = 29.8%

Kickouts = 163186395; Dirty kickouts = 36736083; Transfers = 163186915

VC Hit count = 5844715

L1 cache cost (Icache $800) + (Dcache $800) = $1600

L2 cache cost = $100; Memory cost = $75 Total cost = $1775

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sjeng.L1-small Simulation Results

-------------------------------------------------------------------------

Memory system:

Dcache size = 4096 : ways = 1 : block size = 32

Icache size = 4096 : ways = 1 : block size = 32

L2-cache size = 32768 : ways = 1 : block size = 64

Memory ready time = 50 : chunksize = 8 : chunktime = 15

Execute time = 130091527498; Total refs = 17300001933

Inst refs = 12741056222; Data refs = 4558945711

Number of reference types: [Percentage]

Reads = 3299993836 [19.1%]

Writes = 1258951875 [ 7.3%]

Inst. = 12741056222 [73.6%]

Total = 17300001933

Total cycles for activities: [Percentage]

Reads = 35522149155 [27.3%]

Writes = 15801533416 [12.1%]

Inst. = 78767844927 [60.5%]

Total =130091527498

CPI = 10.2

Ideal: Exec. Time = 30041058155; CPI = 2.4

Ideal mis-aligned: Exec. Time = 40161444400; CPI = 3.2

Memory Level: L1i

Hit Count = 21080519103 Miss Count = 635038001

Total Requests = 21715557104

Hit Rate = 97.1% Miss Rate = 2.9%

Kickouts = 579198944; Dirty kickouts = 0; Transfers = 579199080

VC Hit count = 55838921

Memory Level: L1d

Hit Count = 5144935625 Miss Count = 559895449

Total Requests = 5704831074

Hit Rate = 90.2% Miss Rate = 9.8%

Kickouts = 387909946; Dirty kickouts = 147202554; Transfers = 387910082

VC Hit count = 171985367

Memory Level: L2

Hit Count = 838472506 Miss Count = 275839210

Total Requests = 1114311716

Hit Rate = 75.2% Miss Rate = 24.8%

Kickouts = 251053513; Dirty kickouts = 53257242; Transfers = 251054033

VC Hit count = 24785177

L1 cache cost (Icache $100) + (Dcache $100) = $200

L2 cache cost = $100; Memory cost = $75 Total cost = $375

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sjeng.L1-small-4way Simulation Results

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Memory system:

Dcache size = 4096 : ways = 4 : block size = 32

Icache size = 4096 : ways = 4 : block size = 32

L2-cache size = 32768 : ways = 1 : block size = 64

Memory ready time = 50 : chunksize = 8 : chunktime = 15

Execute time = 124770147094; Total refs = 17300001933

Inst refs = 12741056222; Data refs = 4558945711

Number of reference types: [Percentage]

Reads = 3299993836 [19.1%]

Writes = 1258951875 [ 7.3%]

Inst. = 12741056222 [73.6%]

Total = 17300001933

Total cycles for activities: [Percentage]

Reads = 32975317005 [26.4%]

Writes = 14466306170 [11.6%]

Inst. = 77328523919 [62.0%]

Total =124770147094

CPI = 9.8

Ideal: Exec. Time = 30041058155; CPI = 2.4

Ideal mis-aligned: Exec. Time = 40161444400; CPI = 3.2

Memory Level: L1i

Hit Count = 21124519083 Miss Count = 591038021

Total Requests = 21715557104

Hit Rate = 97.3% Miss Rate = 2.7%

Kickouts = 549306198; Dirty kickouts = 0; Transfers = 549306334

VC Hit count = 41731687

Memory Level: L1d

Hit Count = 5401443669 Miss Count = 303387405

Total Requests = 5704831074

Hit Rate = 94.7% Miss Rate = 5.3%

Kickouts = 281169770; Dirty kickouts = 115258621; Transfers = 281169906

VC Hit count = 22217499

Memory Level: L2

Hit Count = 682080105 Miss Count = 263654756

Total Requests = 945734861

Hit Rate = 72.1% Miss Rate = 27.9%

Kickouts = 250847302; Dirty kickouts = 52469698; Transfers = 250847822

VC Hit count = 12806934

L1 cache cost (Icache $300) + (Dcache $300) = $600

L2 cache cost = $100; Memory cost = $75 Total cost = $775

-------------------------------------------------------------------------

sjeng.default Simulation Results

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Memory system:

Dcache size = 8192 : ways = 1 : block size = 32

Icache size = 8192 : ways = 1 : block size = 32

L2-cache size = 32768 : ways = 1 : block size = 64

Memory ready time = 50 : chunksize = 8 : chunktime = 15

Execute time = 106335247059; Total refs = 17300001933

Inst refs = 12741056222; Data refs = 4558945711

Number of reference types: [Percentage]

Reads = 3299993836 [19.1%]

Writes = 1258951875 [ 7.3%]

Inst. = 12741056222 [73.6%]

Total = 17300001933

Total cycles for activities: [Percentage]

Reads = 25430426927 [23.9%]

Writes = 13905815484 [13.1%]

Inst. = 66999004648 [63.0%]

Total =106335247059

CPI = 8.3

Ideal: Exec. Time = 30041058155; CPI = 2.4

Ideal mis-aligned: Exec. Time = 40161444400; CPI = 3.2

Memory Level: L1i

Hit Count = 21310647762 Miss Count = 404909342

Total Requests = 21715557104

Hit Rate = 98.1% Miss Rate = 1.9%

Kickouts = 373687626; Dirty kickouts = 0; Transfers = 373687890

VC Hit count = 31221452

Memory Level: L1d

Hit Count = 5381411277 Miss Count = 323419797

Total Requests = 5704831074

Hit Rate = 94.3% Miss Rate = 5.7%

Kickouts = 227161103; Dirty kickouts = 99092298; Transfers = 227161367

VC Hit count = 96258430

Memory Level: L2

Hit Count = 485941759 Miss Count = 213999796

Total Requests = 699941555

Hit Rate = 69.4% Miss Rate = 30.6%

Kickouts = 198648199; Dirty kickouts = 44168570; Transfers = 198648719

VC Hit count = 15351077

L1 cache cost (Icache $200) + (Dcache $200) = $400

L2 cache cost = $100; Memory cost = $75 Total cost = $575

-------------------------------------------------------------------------

sjeng.default\_16 Simulation Results

-------------------------------------------------------------------------

Memory system:

Dcache size = 8192 : ways = 1 : block size = 32

Icache size = 8192 : ways = 1 : block size = 32

L2-cache size = 32768 : ways = 1 : block size = 64

Memory ready time = 50 : chunksize = 16 : chunktime = 15

Execute time = 91766209719; Total refs = 17300001933

Inst refs = 12741056222; Data refs = 4558945711

Number of reference types: [Percentage]

Reads = 3299993836 [19.1%]

Writes = 1258951875 [ 7.3%]

Inst. = 12741056222 [73.6%]

Total = 17300001933

Total cycles for activities: [Percentage]

Reads = 20557356107 [22.4%]

Writes = 11094109704 [12.1%]

Inst. = 60114743908 [65.5%]

Total = 91766209719

CPI = 7.2

Ideal: Exec. Time = 30041058155; CPI = 2.4

Ideal mis-aligned: Exec. Time = 40161444400; CPI = 3.2

Memory Level: L1i

Hit Count = 21310647762 Miss Count = 404909342

Total Requests = 21715557104

Hit Rate = 98.1% Miss Rate = 1.9%

Kickouts = 373687626; Dirty kickouts = 0; Transfers = 373687890

VC Hit count = 31221452

Memory Level: L1d

Hit Count = 5381411277 Miss Count = 323419797

Total Requests = 5704831074

Hit Rate = 94.3% Miss Rate = 5.7%

Kickouts = 227161103; Dirty kickouts = 99092298; Transfers = 227161367

VC Hit count = 96258430

Memory Level: L2

Hit Count = 485941759 Miss Count = 213999796

Total Requests = 699941555

Hit Rate = 69.4% Miss Rate = 30.6%

Kickouts = 198648199; Dirty kickouts = 44168570; Transfers = 198648719

VC Hit count = 15351077

L1 cache cost (Icache $200) + (Dcache $200) = $400

L2 cache cost = $100; Memory cost = $175 Total cost = $675

-------------------------------------------------------------------------

sjeng.default\_32 Simulation Results

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Memory system:

Dcache size = 8192 : ways = 1 : block size = 32

Icache size = 8192 : ways = 1 : block size = 32

L2-cache size = 32768 : ways = 1 : block size = 64

Memory ready time = 50 : chunksize = 32 : chunktime = 15

Execute time = 84481691049; Total refs = 17300001933

Inst refs = 12741056222; Data refs = 4558945711

Number of reference types: [Percentage]

Reads = 3299993836 [19.1%]

Writes = 1258951875 [ 7.3%]

Inst. = 12741056222 [73.6%]

Total = 17300001933

Total cycles for activities: [Percentage]

Reads = 18120820697 [21.4%]

Writes = 9688256814 [11.5%]

Inst. = 56672613538 [67.1%]

Total = 84481691049

CPI = 6.6

Ideal: Exec. Time = 30041058155; CPI = 2.4

Ideal mis-aligned: Exec. Time = 40161444400; CPI = 3.2

Memory Level: L1i

Hit Count = 21310647762 Miss Count = 404909342

Total Requests = 21715557104

Hit Rate = 98.1% Miss Rate = 1.9%

Kickouts = 373687626; Dirty kickouts = 0; Transfers = 373687890

VC Hit count = 31221452

Memory Level: L1d

Hit Count = 5381411277 Miss Count = 323419797

Total Requests = 5704831074

Hit Rate = 94.3% Miss Rate = 5.7%

Kickouts = 227161103; Dirty kickouts = 99092298; Transfers = 227161367

VC Hit count = 96258430

Memory Level: L2

Hit Count = 485941759 Miss Count = 213999796

Total Requests = 699941555

Hit Rate = 69.4% Miss Rate = 30.6%

Kickouts = 198648199; Dirty kickouts = 44168570; Transfers = 198648719

VC Hit count = 15351077

L1 cache cost (Icache $200) + (Dcache $200) = $400

L2 cache cost = $100; Memory cost = $275 Total cost = $775

-------------------------------------------------------------------------

sjeng.default\_64 Simulation Results

-------------------------------------------------------------------------

Memory system:

Dcache size = 8192 : ways = 1 : block size = 32

Icache size = 8192 : ways = 1 : block size = 32

L2-cache size = 32768 : ways = 1 : block size = 64

Memory ready time = 50 : chunksize = 64 : chunktime = 15

Execute time = 80839431714; Total refs = 17300001933

Inst refs = 12741056222; Data refs = 4558945711

Number of reference types: [Percentage]

Reads = 3299993836 [19.1%]

Writes = 1258951875 [ 7.3%]

Inst. = 12741056222 [73.6%]

Total = 17300001933

Total cycles for activities: [Percentage]

Reads = 16902552992 [20.9%]

Writes = 8985330369 [11.1%]

Inst. = 54951548353 [68.0%]

Total = 80839431714

CPI = 6.3

Ideal: Exec. Time = 30041058155; CPI = 2.4

Ideal mis-aligned: Exec. Time = 40161444400; CPI = 3.2

Memory Level: L1i

Hit Count = 21310647762 Miss Count = 404909342

Total Requests = 21715557104

Hit Rate = 98.1% Miss Rate = 1.9%

Kickouts = 373687626; Dirty kickouts = 0; Transfers = 373687890

VC Hit count = 31221452

Memory Level: L1d

Hit Count = 5381411277 Miss Count = 323419797

Total Requests = 5704831074

Hit Rate = 94.3% Miss Rate = 5.7%

Kickouts = 227161103; Dirty kickouts = 99092298; Transfers = 227161367

VC Hit count = 96258430

Memory Level: L2

Hit Count = 485941759 Miss Count = 213999796

Total Requests = 699941555

Hit Rate = 69.4% Miss Rate = 30.6%

Kickouts = 198648199; Dirty kickouts = 44168570; Transfers = 198648719

VC Hit count = 15351077

L1 cache cost (Icache $200) + (Dcache $200) = $400

L2 cache cost = $100; Memory cost = $375 Total cost = $875