



SPEC® CINT2006 Result

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IBM Corporation

SPECint®_rate2006 = 79.2

IBM System x3655 (AMD Opteron 2344 HE)

SPECint_rate_base2006 = 68.4

CPU2006 license: 11

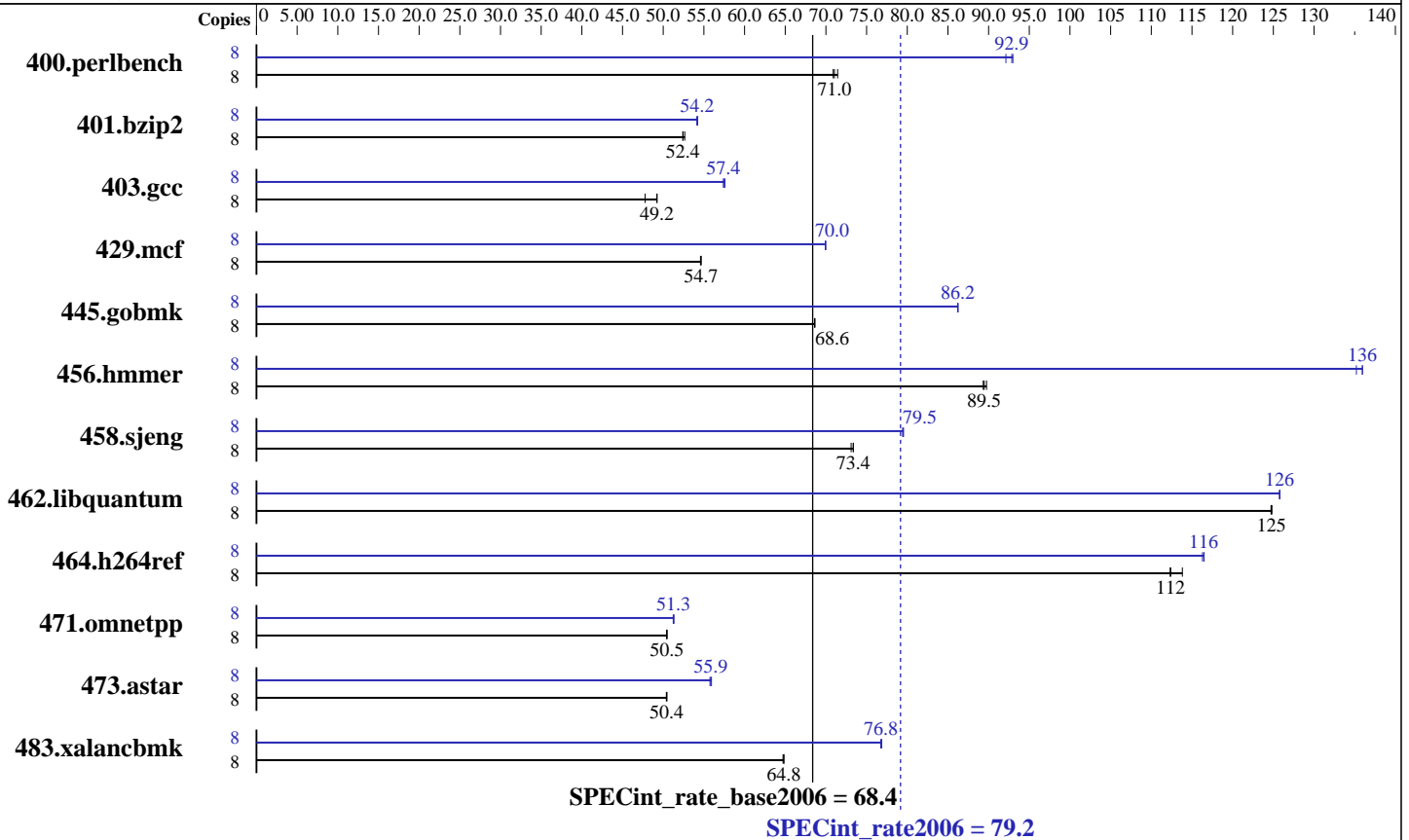
Test sponsor: IBM Corporation

Tested by: Advanced Micro Devices

Test date: Jun-2008

Hardware Availability: Aug-2008

Software Availability: Jun-2008



Hardware

CPU Name: AMD Opteron 2344 HE
 CPU Characteristics:
 CPU MHz: 1700
 FPU: Integrated
 CPU(s) enabled: 8 cores, 2 chips, 4 cores/chip
 CPU(s) orderable: 1,2 chips
 Primary Cache: 64 KB I + 64 KB D on chip per core
 Secondary Cache: 512 KB I+D on chip per core
 L3 Cache: 2 MB I+D on chip per chip
 Other Cache: None
 Memory: 16 GB (8 x 2 GB, DDR2-667 CL5 Reg Dual Rank)
 Disk Subsystem: 1 x 73.4 GB SAS, 15000 RPM
 Other Hardware: None

Software

Operating System: SuSE Linux Enterprise Server 10 (x86_64) SP1, Kernel 2.6.16.46-0.12-smp
 Compiler: PGI Server Complete Version 7.2 PathScale Compiler Suite Version 3.2
 Auto Parallel: No
 File System: ext3
 System State: Run level 3 (Full multiuser with network)
 Base Pointers: 32/64-bit
 Peak Pointers: 32/64-bit
 Other Software: SmartHeap 8.0 32-bit Library for Linux



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Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
400.perlbench	8	1094	71.4	1102	70.9	1100	71.0	8	842	92.9	841	93.0	848	92.1
401.bzip2	8	1466	52.6	1472	52.4	1473	52.4	8	1426	54.1	1425	54.2	1423	54.2
403.gcc	8	1348	47.8	1308	49.2	1308	49.2	8	1122	57.4	1118	57.6	1122	57.4
429.mcf	8	1337	54.6	1335	54.7	1335	54.7	8	1043	69.9	1043	70.0	1043	70.0
445.gobmk	8	1223	68.6	1223	68.6	1223	68.6	8	973	86.2	973	86.3	974	86.2
456.hmmer	8	836	89.3	832	89.7	834	89.5	8	549	136	549	136	552	135
458.sjeng	8	1324	73.1	1320	73.4	1319	73.4	8	1217	79.5	1218	79.5	1219	79.4
462.libquantum	8	1329	125	1328	125	1328	125	8	1318	126	1318	126	1318	126
464.h264ref	8	1576	112	1575	112	1555	114	8	1520	116	1522	116	1520	116
471.omnetpp	8	991	50.5	991	50.5	992	50.4	8	974	51.3	975	51.3	976	51.2
473.astar	8	1113	50.5	1114	50.4	1115	50.4	8	1004	55.9	1006	55.9	1007	55.7
483.xalancbmk	8	851	64.8	853	64.7	852	64.8	8	719	76.8	718	76.9	719	76.7

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

Operating System Notes

```
'numactl' was used to bind copies to the cores
Environment variable PGI_HUGE_PAGES set to 150
'ulimit -s unlimited' was used to set environment stack size
'ulimit -l 2097152' was used to set environment locked pages in memory limit
Set vm/nr_hugepages=1200 in /etc/sysctl.conf
mount -t hugetlbfs nodev /mnt/hugepages
```

Base Compiler Invocation

C benchmarks:

pgcc

C++ benchmarks:

pgcpp

Base Portability Flags

```
400.perlbench: -DSPEC_CPU_LP64 -DSPEC_CPU_LINUX_X64
401.bzip2: -DSPEC_CPU_LP64
403.gcc: -DSPEC_CPU_LP64
429.mcf: -DSPEC_CPU_LP64
445.gobmk: -DSPEC_CPU_LP64
456.hmmer: -DSPEC_CPU_LP64
```

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Base Portability Flags (Continued)

458.sjeng: -DSPEC_CPU_LP64
462.libquantum: -DSPEC_CPU_LP64 -DSPEC_CPU_LINUX
464.h264ref: -DSPEC_CPU_LP64
483.xalancbmk: -DSPEC_CPU_LINUX

Base Optimization Flags

C benchmarks:
-fastsse -Msmartalloc=huge:150 -Mfprelaxed -Mipa=fast -Mipa=inline
-tp barcelona-64 -Bstatic_pgi

C++ benchmarks:
-fastsse -Msmartalloc=huge:150 -Mfprelaxed --zc_eh -Mipa=fast
-Mipa=inline -tp barcelona -Bstatic_pgi

Base Other Flags

C benchmarks:
-Mipa=jobs:4

C++ benchmarks:
-Mipa=jobs:4

Peak Compiler Invocation

C benchmarks (except as noted below):
pgcc

400.perlbench: pathcc

403.gcc: pathcc

445.gobmk: pathcc

464.h264ref: pathcc

C++ benchmarks (except as noted below):
pathCC

473.astar: pgcpp



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Peak Portability Flags

400.perlbench: -DSPEC_CPU_LP64 -DSPEC_CPU_LINUX_X64
 401.bzip2: -DSPEC_CPU_LP64
 445.gobmk: -DSPEC_CPU_LP64
 456.hmmr: -DSPEC_CPU_LP64
 458.sjeng: -DSPEC_CPU_LP64
 462.libquantum: -DSPEC_CPU_LP64 -DSPEC_CPU_LINUX
 464.h264ref: -DSPEC_CPU_LP64
 483.xalancbmk: -DSPEC_CPU_LINUX

Peak Optimization Flags

C benchmarks:

400.perlbench: -march=barcelona -fb_create fbdata(pass 1)
 -fb_opt fbdata(pass 2) -Ofast -IPA:plimit=20000 -LNO:opt=0
 -WOPT:if_conv=0 -CG:local_sched_alg=1

401.bzip2: -Mpfi=indirect(pass 1) -Mpfo=indirect(pass 2) -fastsse -O4
 -Msmartalloc=huge:150 -Mprefetch=t0 -Mnounroll
 -tp barcelona-64 -Bstatic_pgi

403.gcc: -march=barcelona -fb_create fbdata(pass 1)
 -fb_opt fbdata(pass 2) -O3 -OPT:Ofast -m32

429.mcf: -fastsse -Msmartalloc=huge:150 -Mipa=fast -Mipa=inline:1
 -tp barcelona -Bstatic_pgi

445.gobmk: -march=barcelona -fb_create fbdata(pass 1)
 -fb_opt fbdata(pass 2) -O3 -OPT:alias=restrict
 -LNO:prefetch=1 -LNO:ignore_feedback=off -CG:p2align=on

456.hmmr: -fastsse -Mvect=partial -Munroll=n:8 -Msmartalloc=huge:150
 -Msafeptr -Mprefetch=t0 -Mfprelaxed -Mipa=const -Mipa=ptr
 -Mipa=arg -Mipa=inline -tp barcelona-64 -Bstatic_pgi

458.sjeng: -Mpfi(pass 1) -Mpfo(pass 2) -Mipa=fast(pass 2)
 -Mipa=inline:1(pass 2) -Mipa=noarg(pass 2) -fastsse
 -Msmartalloc=huge:150 -Mfprelaxed -tp barcelona-64
 -Bstatic_pgi

462.libquantum: -fastsse -Munroll=m:8 -Msmartalloc=huge:150
 -Mprefetch=distance:4 -Mfprelaxed -Mipa=fast -Mipa=inline
 -Mipa=noarg -tp barcelona-64 -Bstatic_pgi

464.h264ref: -march=barcelona -fb_create fbdata(pass 1)
 -fb_opt fbdata(pass 2) -O3 -IPA:plimit=20000
 -OPT:alias=disjoint -LNO:prefetch=0 -CG:ptr_load_use=0
 -CG:push_pop_int_saved_regs=off

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Peak Optimization Flags (Continued)

C++ benchmarks:

471.omnetpp: -march=barcelona -Ofast -CG:gcm=off -INLINE:aggressive=on
-OPT:alias=disjoint -WOPT:if_conv=0 -m32 -lsmarheap

473.astar: -Mpfi(pass 1) -Mpfo(pass 2) -Mipa=fast(pass 2)
-Mipa=inline:6(pass 2) -fastsse -O4 -Msmartalloc=huge:150
-Msafeptr=global -Mfpelaxed --zc_eh -tp barcelona
-Bstatic_pgi

483.xalancbmk: -march=barcelona -Ofast -OPT:unroll_times_max=8
-CG:push_pop_int_saved_regs=off -CG:ptr_load_use=0 -m32
-lsmarheap

Peak Other Flags

C benchmarks:

429.mcf: -Mipa=jobs:4

456.hmmer: -Mipa=jobs:4

458.sjeng: -Mipa=jobs:4(pass 2)

462.libquantum: -Mipa=jobs:4

C++ benchmarks (except as noted below):

-L/root/work/cpu2006-amd421gh/amd421gh.libs/32

473.astar: -Mipa=jobs:4(pass 2)

The flags file that was used to format this result can be browsed at

<http://www.spec.org/cpu2006/flags/amd421GH-flags.20090713.00.html>

You can also download the XML flags source by saving the following link:

<http://www.spec.org/cpu2006/flags/amd421GH-flags.20090713.00.xml>



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