



SPEC[®] CINT2006 Result

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Sun Microsystems

SPECint[®]_rate2006 = 155

Sun Fire X4140 (AMD Opteron 2389 2.9GHz)

SPECint_rate_base2006 = 121

CPU2006 license: 6

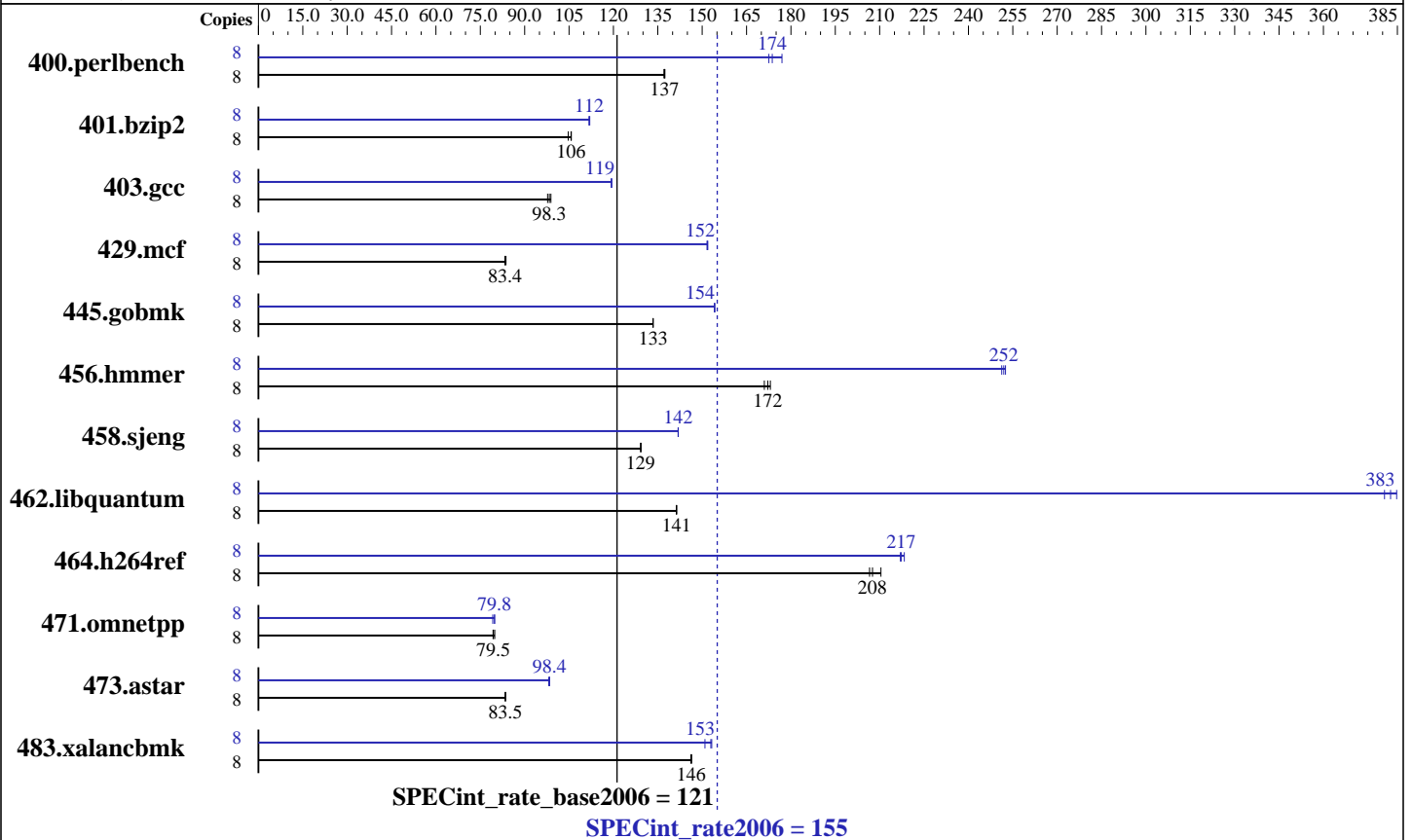
Test sponsor: Sun Microsystems

Tested by: Sun Microsystems

Test date: Sep-2009

Hardware Availability: May-2009

Software Availability: Jul-2009



Hardware

CPU Name: AMD Opteron 2389
 CPU Characteristics:
 CPU MHz: 2900
 FPU: Integrated
 CPU(s) enabled: 8 cores, 2 chips, 4 cores/chip
 CPU(s) orderable: 1 or 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: 6 MB I+D on chip per chip
 Other Cache: None
 Memory: 32 GB (8x4GB, DDR2-667, CL5, Reg, Dual Rank)
 Disk Subsystem: SAS, 72 GB, 10 K RPM
 Other Hardware: See additional details below

Software

Operating System: Red Hat Enterprise Linux Server release 5.3, Kernel 2.6.18-128.el5 for x86_64
 Compiler: PGI Server Complete Version 8.0 x86 Open64 4.2.2 Compiler Suite (from AMD)
 Auto Parallel: No
 File System: ReiserFS
 System State: Run level 3 (Full multiuser with network)
 Base Pointers: 64-bit
 Peak Pointers: 32/64-bit
 Other Software: binutils 2.18 SmartHeap 8.1 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	569	137	570	137	<u>569</u>	<u>137</u>	8	453	173	<u>450</u>	<u>174</u>	442	177
401.bzip2	8	730	106	737	105	<u>731</u>	<u>106</u>	8	691	112	689	112	<u>690</u>	<u>112</u>
403.gcc	8	651	98.9	<u>655</u>	<u>98.3</u>	659	97.7	8	<u>540</u>	<u>119</u>	540	119	539	119
429.mcf	8	872	83.7	<u>875</u>	<u>83.4</u>	876	83.3	8	481	152	<u>481</u>	<u>152</u>	480	152
445.gobmk	8	629	133	629	133	<u>629</u>	<u>133</u>	8	<u>544</u>	<u>154</u>	545	154	544	154
456.hammer	8	436	171	431	173	<u>433</u>	<u>172</u>	8	297	251	296	253	<u>296</u>	<u>252</u>
458.sjeng	8	<u>749</u>	<u>129</u>	749	129	749	129	8	682	142	682	142	<u>682</u>	<u>142</u>
462.libquantum	8	<u>1173</u>	<u>141</u>	1172	141	1174	141	8	431	385	<u>433</u>	<u>383</u>	435	381
464.h264ref	8	857	207	<u>853</u>	<u>208</u>	841	210	8	811	218	<u>815</u>	<u>217</u>	816	217
471.omnetpp	8	626	79.9	630	79.3	<u>629</u>	<u>79.5</u>	8	626	79.9	631	79.2	<u>627</u>	<u>79.8</u>
473.astar	8	<u>673</u>	<u>83.5</u>	673	83.4	672	83.5	8	572	98.1	<u>571</u>	<u>98.4</u>	571	98.4
483.xalancbmk	8	377	146	<u>377</u>	<u>146</u>	378	146	8	366	151	360	153	<u>361</u>	<u>153</u>

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

Submit Notes

The config file option 'submit' was used.
'numactl' was used to bind copies to the cores.
See the configuration file for details.

Operating System Notes

'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=7168 in /etc/sysctl.conf
mount -t hugetlbfs nodev /mnt/hugepages

Platform Notes

Default BIOS settings used except:
DCT Unganged Mode set to "Always" to enable unganged mode.

General Notes

Environment variables set by runspec before the start of the run:
HUGETLB_LIMIT = "896"
LD_LIBRARY_PATH = "/data1/cpu2006v1.1/amd0905is-libs/64:/data1/cpu2006v1.1/amd0905is-libs/32"
PGI_HUGE_PAGES = "896"

The x86 Open64 Compiler Suite is only available from (and supported by) AMD at
http://developer.amd.com/cpu/open64.



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Base Compiler Invocation

C benchmarks:
opencc

C++ benchmarks:
openCC

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
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:
-march=barcelona -Ofast -CG:local_sched_alg=1 -HP:bdt=2m:heap=2m

C++ benchmarks:
-march=barcelona -Ofast -m32 -INLINE:aggressive=on
-L/root/work/libraries/SmartHeap-8.1/lib -lsmarheap

Peak Compiler Invocation

C benchmarks (except as noted below):
opencc

456.hmmer: pgcc

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

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.hmmer: -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
               -OPT:unroll_times_max=8 -OPT:unroll_size=256
               -OPT:unroll_level=2 -OPT:keep_ext=on -WOPT:if_conv=0
               -CG:local_sched_alg=1 -CG:unroll_fb_req=on
               -HP:bdt=2m:heap=2m

401.bzip2: -march=barcelona -fb_create fbdata(pass 1)
            -fb_opt fbdata(pass 2) -O3 -OPT:alias=disjoint
            -OPT:unroll_size=0 -OPT:Ofast -OPT:goto=off
            -INLINE:aggressive=on -CG:local_sched_alg=1 -m3dnw
            -HP:bdt=2m:heap=2m

403.gcc: -march=barcelona -fb_create fbdata(pass 1)
          -fb_opt fbdata(pass 2) -Ofast -LNO:trip_count=256
          -LNO:prefetch_ahead=10 -CG:cmp_peep=on -m32
          -HP:bdt=2m:heap=2m -GRA:unspill=on

429.mcf: -march=barcelona -O3 -ipa -INLINE:aggressive=on
          -CG:gcm=off -GRA:prioritize_by_density=on -m32
          -HP:bdt=2m:heap=2m

445.gobmk: -march=barcelona -fb_create fbdata(pass 1)
            -fb_opt fbdata(pass 2) -O3 -OPT:alias=restrict
            -OPT:unroll_times_max=8 -OPT:unroll_size=256
            -OPT:unroll_level=2 -OPT:keep_ext=on -ipa -IPA:plimit=750
            -IPA:min_hotness=300 -IPA:pu_reorder=1 -LNO:prefetch=1
            -LNO:ignore_feedback=off -CG:p2align=on
            -CG:unroll_fb_req=on -HP:bdt=2m:heap=2m

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

```

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Peak Optimization Flags (Continued)

458.sjeng: -march=barcelona -fb_create fbdata(pass 1)
 -fb_opt fbdata(pass 2) -O3 -ipa -LNO:ignore_feedback=off
 -LNO:full_unroll=10 -LNO:fusion=0 -LNO:fission=2
 -IPA:pu_reorder=2 -CG:ptr_load_use=0
 -OPT:unroll_times_max=8 -INLINE:aggressive=on
 -HP:bdt=2m:heap=2m

462.libquantum: -march=barcelona -Ofast -LNO:pf2=0 -CG:gcm=off
 -CG:use_prefetchnta=on -CG:cmp_peep=on -WOPT:aggstr=0
 -HP:bdt=2m:heap=2m -OPT:alias=disjoint
 -INLINE:aggressive=on -IPA:space=1000 -IPA:plimit=20000

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 -HP:bdt=2m:heap=2m

C++ benchmarks:

471.omnetpp: -march=barcelona -Ofast -CG:gcm=off -INLINE:aggressive=on
 -OPT:alias=disjoint -WOPT:if_conv=0 -m32
 -L/root/work/libraries/SmartHeap-8.1/lib -lsmarheap

473.astar: -Mpfi(pass 1) -Mpfo(pass 2) -Mipa=fast(pass 2)
 -Mipa=inline:6(pass 2) -fastsse -O4 -Msmartalloc=huge
 -Msafeptr=global -Mfp relaxed --zc_eh -tp shanghai-32
 -Bstatic_pgi

483.xalancbmk: -march=barcelona -Ofast -INLINE:aggressive=on -m32
 -CG:cmp_peep=on -GRA:unspill=on -TENV:frame_pointer=off
 -L/root/work/libraries/SmartHeap-8.1/lib -lsmarheap

Peak Other Flags

C benchmarks:

456.hmmmer: -Mipa=jobs:4

C++ benchmarks:

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

The flags files that were used to format this result can be browsed at

<http://www.spec.org/cpu2006/flags/amd-platform.20090929.html>

http://www.spec.org/cpu2006/flags/pgi80_linux_flags.20090915.html

<http://www.spec.org/cpu2006/flags/x86-open64-4.2.2-flags-revE.20090915.html>



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You can also download the XML flags sources by saving the following links:

<http://www.spec.org/cpu2006/flags/amd-platform.20090929.xml>

http://www.spec.org/cpu2006/flags/pg180_linux_flags.20090915.xml

<http://www.spec.org/cpu2006/flags/x86-open64-4.2.2-flags-revE.20090915.xml>

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