SPEC® CINT2006 Result

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Sun Microsystems

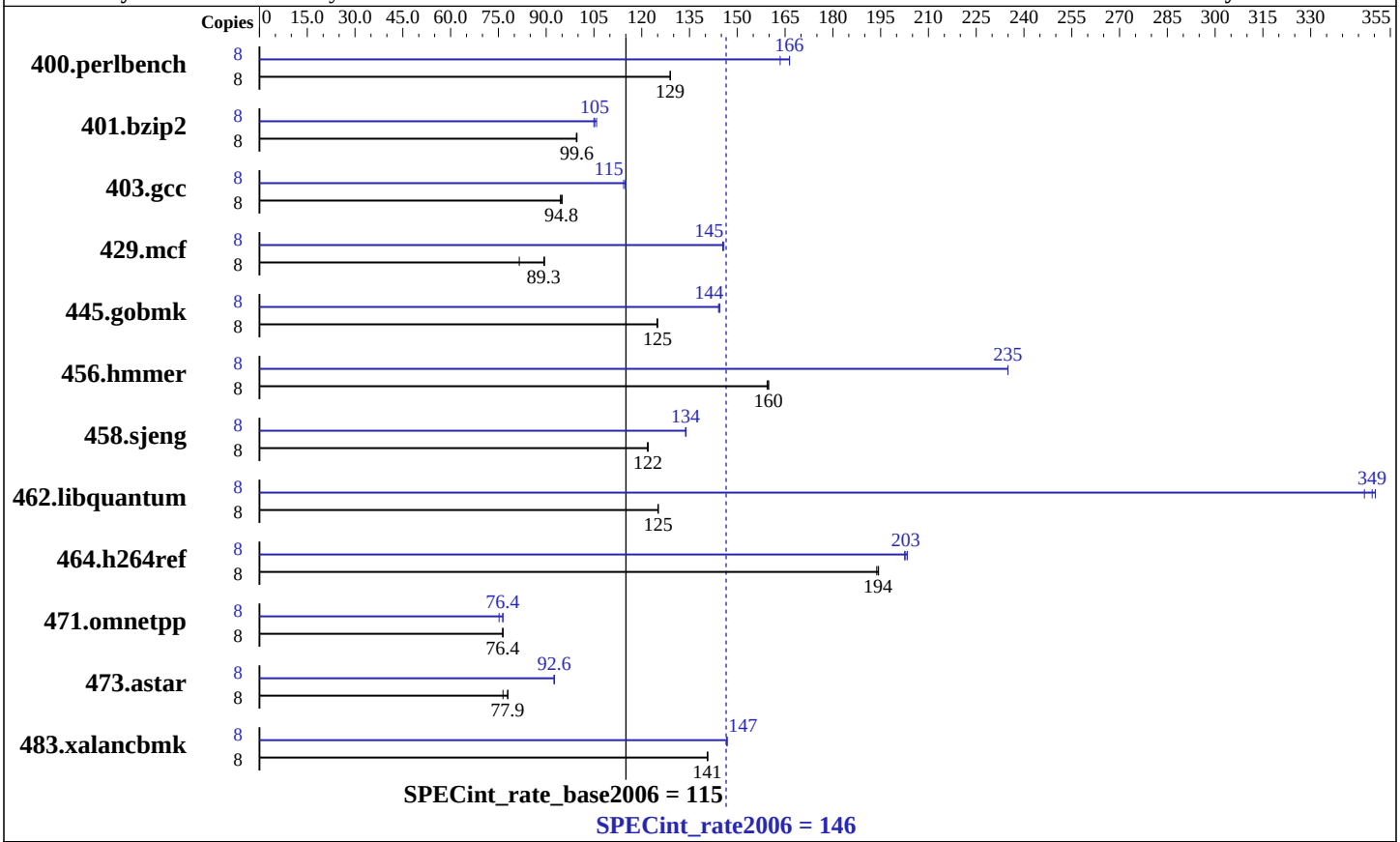
Sun Fire X4140 (AMD Opteron 2384 2.7GHz)

SPECint®_rate2006 = 146

SPECint_rate_base2006 = 115

CPU2006 license: 6
Test sponsor: Sun Microsystems
Tested by: Sun Microsystems

Test date: Sep-2009
Hardware Availability: Jan-2009
Software Availability: Jul-2009



Hardware

CPU Name:	AMD Opteron 2384
CPU Characteristics:	
CPU MHz:	2700
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	606	129	**606**	**129**	606	129	8	478	163	470	166	**470**	**166**
401.bzip2	8	775	99.6	776	99.5	**775**	**99.6**	8	735	105	**734**	**105**	729	106
403.gcc	8	682	94.5	**679**	**94.8**	678	95.1	8	**561**	**115**	563	114	560	115
429.mcf	8	**817**	**89.3**	895	81.6	815	89.5	8	**502**	**145**	502	145	500	146
445.gobmk	8	672	125	672	125	**672**	**125**	8	582	144	581	144	**581**	**144**
456.hmmer	8	467	160	**467**	**160**	468	159	8	318	235	**318**	**235**	318	235
458.sjeng	8	**794**	**122**	795	122	793	122	8	**723**	**134**	724	134	723	134
462.libquantum	8	1325	125	1324	125	**1325**	**125**	8	**475**	**349**	473	350	478	347
464.h264ref	8	914	194	911	194	**912**	**194**	8	874	203	870	203	**873**	**203**
471.omnetpp	8	654	76.4	**655**	**76.4**	655	76.4	8	665	75.2	**655**	**76.4**	654	76.4
473.astar	8	**721**	**77.9**	735	76.5	720	78.0	8	608	92.4	606	92.6	**607**	**92.6**
483.xalancbmk	8	**393**	**141**	393	141	392	141	8	**376**	**147**	376	147	376	147

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
<a href="http://developer.amd.com/cpu/open64">http://developer.amd.com/cpu/open64</a>.
```

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 -lsmartheap

Peak Compiler Invocation

C benchmarks (except as noted below):
opencc

456.hmmer: pgcc

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

473.astar: pgcpp

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 -m3dnow
-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

Continued on next page

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 -lsmartheap`

473.astar: `-Mpfi`(pass 1) `-Mpfo`(pass 2) `-Mipa=fast`(pass 2)
`-Mipa=inline:6`(pass 2) `-fastsse -O4 -Msmartalloc=huge`
`-Msafeptr=global -Mfprelaxed --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 -lsmartheap`

Peak Other Flags

C benchmarks:

456.hmmer: `-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

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/pgi80_linux_flags.20090915.xml
http://www.spec.org/cpu2006/flags/x86-open64-4.2.2-flags-revE.20090915.xml

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