SPEC® CFP2006 Result

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Tyan
(Test Sponsor: Advanced Micro Devices)

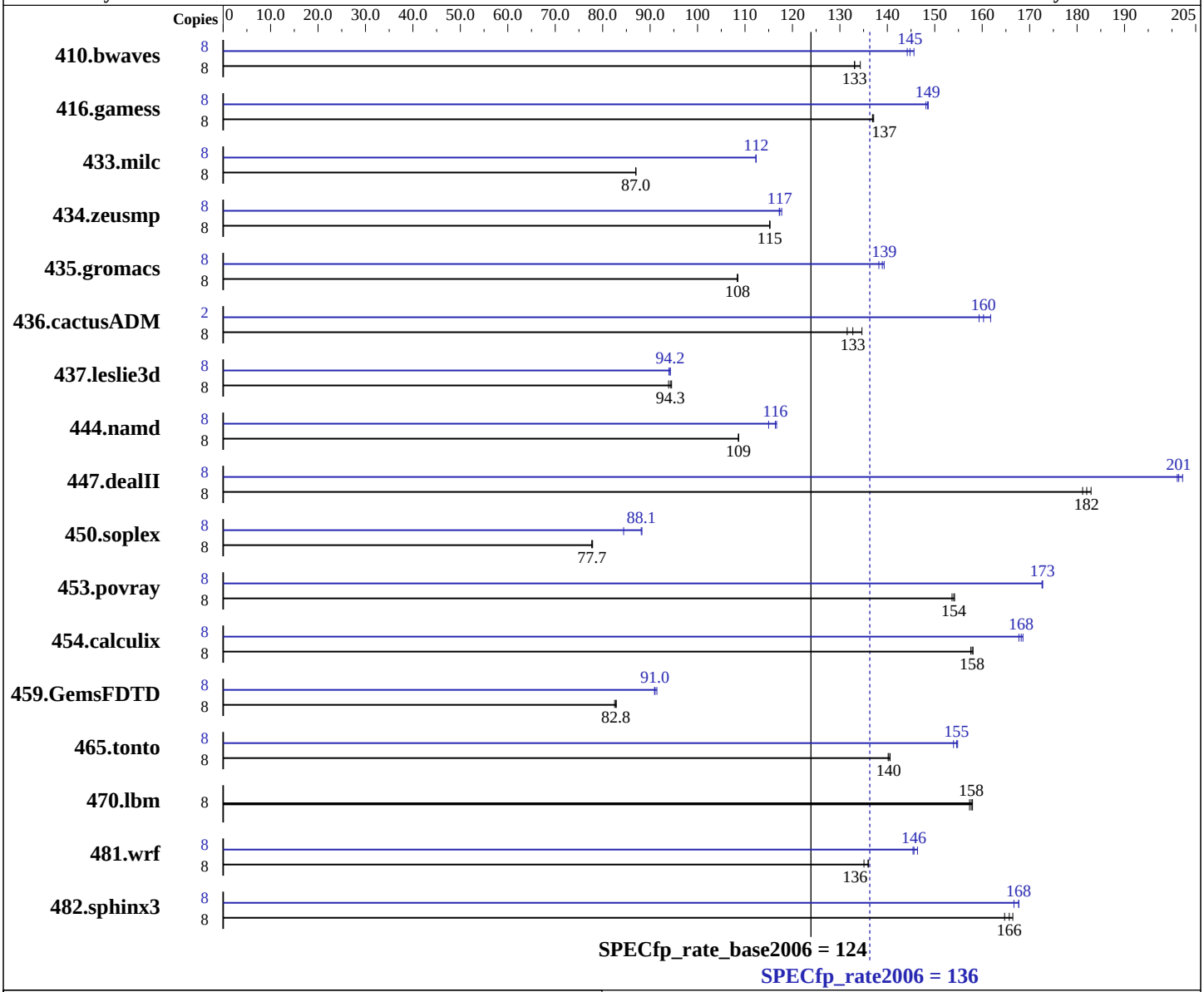
Tyan YR190B8228, AMD Opteron 4130

SPECfp®_rate2006 = 136

SPECfp_rate_base2006 = 124

CPU2006 license: 49
Test sponsor: Advanced Micro Devices
Tested by: Advanced Micro Devices

Test date: Aug-2010
Hardware Availability: Aug-2010
Software Availability: Jul-2010



Hardware

CPU Name:	AMD Opteron 4130
CPU Characteristics:	
CPU MHz:	2600
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

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Software

Operating System:	SUSE Linux Enterprise Server 11 (x86_64), Kernel 2.6.27.19-5-default
Compiler:	x86 Open64 4.2.4 Compiler Suite (from AMD)
Auto Parallel:	Yes
File System:	ext3
System State:	Run level 3 (Full multiuser with network)
Base Pointers:	64-bit
Peak Pointers:	32/64-bit
Other Software:	None

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L3 Cache: 6 MB I+D on chip per chip
Other Cache: None
Memory: 32 GB (4 x 8 GB, DDR3-1333, CL9, Reg, Dual Rank)
Disk Subsystem: 1 x 128 GB SATA SSD, Western Digital SiliconEdge Blue SSC-D0128SC-2100
Other Hardware: None

Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	8	**817**	**133**	817	133	810	134	8	754	144	**751**	**145**	747	146
416.gamess	8	**1144**	**137**	1144	137	1142	137	8	**1055**	**149**	1054	149	1057	148
433.milc	8	844	87.0	845	87.0	**844**	**87.0**	8	**654**	**112**	654	112	654	112
434.zeusmp	8	632	115	**632**	**115**	632	115	8	621	117	618	118	**621**	**117**
435.gromacs	8	**527**	**108**	527	108	527	108	8	410	139	413	138	**411**	**139**
436.cactusADM	8	710	135	727	132	**720**	**133**	2	148	162	**149**	**160**	150	159
437.leslie3d	8	801	93.9	**798**	**94.3**	796	94.5	8	798	94.2	800	94.0	**798**	**94.2**
444.namd	8	**591**	**109**	591	109	590	109	8	558	115	**551**	**116**	550	117
447.dealII	8	505	181	500	183	**503**	**182**	8	**454**	**201**	453	202	455	201
450.soplex	8	858	77.7	857	77.9	**858**	**77.7**	8	790	84.4	**757**	**88.1**	756	88.3
453.povray	8	276	154	**276**	**154**	277	154	8	246	173	**246**	**173**	247	173
454.calculix	8	418	158	419	158	**418**	**158**	8	**392**	**168**	393	168	391	169
459.GemsFDTD	8	1029	82.5	**1025**	**82.8**	1024	82.9	8	928	91.4	934	90.9	**932**	**91.0**
465.tonto	8	562	140	**561**	**140**	560	141	8	**509**	**155**	511	154	508	155
470.lbm	8	696	158	**697**	**158**	699	157	8	696	158	**697**	**158**	699	157
481.wrf	8	662	135	**657**	**136**	657	136	8	**614**	**146**	614	145	611	146
482.sphinx3	8	947	165	937	166	**941**	**166**	8	935	167	**930**	**168**	930	168

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
```

General Notes

```
Environment variables set by runspec before the start of the run:
HUGETLB_LIMIT = "896"
LD_LIBRARY_PATH = "/root/work/cpu2006/amd1002li-rate-libs-revC/64:/root/work/cpu2006/amd1002li-rate-libs-revC/32"
OMP_NUM_THREADS = "4"

The x86 Open64 Compiler Suite is only available from (and supported by) AMD at
http://developer.amd.com/cpu/open64
Binaries were compiled on SLES10 SP2 with binutils 2.18
```

Base Compiler Invocation

C benchmarks:
opencc

C++ benchmarks:
openCC

Fortran benchmarks:
openf95

Benchmarks using both Fortran and C:
opencc openf95

Base Portability Flags

410.bwaves: -DSPEC_CPU_LP64
416.gamess: -DSPEC_CPU_LP64
433.milc: -DSPEC_CPU_LP64
434.zeusmp: -DSPEC_CPU_LP64
435.gromacs: -DSPEC_CPU_LP64
436.cactusADM: -DSPEC_CPU_LP64 -fno-second-underscore
437.leslie3d: -DSPEC_CPU_LP64
444.namd: -DSPEC_CPU_LP64
447.dealII: -DSPEC_CPU_LP64
450.soplex: -DSPEC_CPU_LP64
453.povray: -DSPEC_CPU_LP64
454.calculix: -DSPEC_CPU_LP64
459.GemsFDTD: -DSPEC_CPU_LP64
465.tonto: -DSPEC_CPU_LP64
470.lbm: -DSPEC_CPU_LP64
481.wrf: -DSPEC_CPU_LP64 -DSPEC_CPU_LINUX -DSPEC_CPU_CASE_FLAG -fno-second-underscore
482.sphinx3: -DSPEC_CPU_LP64

Base Optimization Flags

C benchmarks:
```
-march=barcelona -mso -Ofast -OPT:malloc_alg=1 -HP:bdt=2m
```

C++ benchmarks:
```
-march=barcelona -mso -Ofast -static -INLINE:aggressive=on
-OPT:malloc_alg=1 -HP:bdt=2m
```

Fortran benchmarks:
```
-march=barcelona -mso -Ofast -HP
```

Benchmarks using both Fortran and C:
```
-march=barcelona -mso -Ofast -OPT:malloc_alg=1 -HP:bdt=2m -HP
```

Peak Compiler Invocation

C benchmarks:
```
opencc
```

C++ benchmarks:
```
openCC
```

Fortran benchmarks:
```
openf95
```

Benchmarks using both Fortran and C:
```
opencc openf95
```

Peak Portability Flags

410.bwaves: -DSPEC_CPU_LP64
416.gamess: -DSPEC_CPU_LP64
433.milc: -DSPEC_CPU_LP64
434.zeusmp: -DSPEC_CPU_LP64
435.gromacs: -DSPEC_CPU_LP64
436.cactusADM: -DSPEC_CPU_LP64 -fno-second-underscore
437.leslie3d: -DSPEC_CPU_LP64
444.namd: -DSPEC_CPU_LP64
453.povray: -DSPEC_CPU_LP64
454.calculix: -DSPEC_CPU_LP64
459.GemsFDTD: -DSPEC_CPU_LP64
465.tonto: -DSPEC_CPU_LP64
470.lbm: -DSPEC_CPU_LP64
481.wrf: -DSPEC_CPU_LP64 -DSPEC_CPU_LINUX -DSPEC_CPU_CASE_FLAG
-fno-second-underscore
482.sphinx3: -DSPEC_CPU_LP64

Peak Optimization Flags

C benchmarks:

433.milc: -march=barcelona -mso -Ofast -CG:movnti=1
-CG:local_sched_alg=1 -CG:locs_shallow_depth=1
-HP:bdt=2m:heap=2m -LNO:prefetch=3

470.lbm: basepeak = yes

482.sphinx3: -march=barcelona -mso -fb_create fbdata(pass 1)
-fb_opt fbdata(pass 2) -Ofast -OPT:malloc_alg=2
-CG:sse_cse_regs=0 -CG:locs_shallow_depth=1 -CG:cmp_peep=on
-CG:local_sched_alg=1 -INLINE:aggressive=on

C++ benchmarks:

444.namd: -march=barcelona -mso -fb_create fbdata(pass 1)
-fb_opt fbdata(pass 2) -Ofast -LNO:ignore_feedback=off
-CG:local_sched_alg=2 -CG:load_exe=0 -CG:compute_to=on
-OPT:unroll_size=256 -fno-exceptions -HP:bdt=2m:heap=2m

447.dealII: -march=barcelona -mso -Ofast -static -INLINE:aggressive=on
-LNO:opt=0 -fno-emit-exceptions -m32
-OPT:unroll_times_max=8 -OPT:unroll_size=256
-OPT:unroll_level=2 -HP:bdt=2m:heap=2m -GRA:unspill=on
-CG:cmp_peep=on -TENV:frame_pointer=off

450.soplex: -march=barcelona -mso -fb_create fbdata(pass 1)
-fb_opt fbdata(pass 2) -O3 -INLINE:aggressive=on
-OPT:IEEE_arith=3 -OPT:IEEE_NaN_Inf=off
-OPT:fold_unsigned_relops=on -OPT:malloc_alg=1
-CG:load_exe=0 -fno-exceptions -m32 -HP:bdt=2m

453.povray: -march=barcelona -mso -fb_create fbdata(pass 1)
-fb_opt fbdata(pass 2) -Ofast -INLINE:aggressive=on

Fortran benchmarks:

410.bwaves: -march=barcelona -mso -O3 -OPT:Ofast -OPT:treeheight=on
-LNO:blocking=off -LNO:prefetch_ahead=5
-LNO:ignore_feedback=off -WOPT:aggstr=0 -HP:bdt=2m:heap=2m
-CG:cmp_peep=on

416.gamess: -march=barcelona -mso -fb_create fbdata(pass 1)
-fb_opt fbdata(pass 2) -O3 -LNO:fu=6 -LNO:blocking=0
-LNO:prefetch=0 -OPT:Ofast -OPT:ro=3 -OPT:unroll_size=256
-HP:bdt=2m:heap=2m

434.zeusmp: -march=barcelona -mso -Ofast -LNO:blocking=off
-LNO:interchange=off -OPT:treeheight=on -OPT:unroll_size=256
-CG:cmp_peep=on -GRA:prioritize_by_density=on -HP

Continued on next page

Peak Optimization Flags (Continued)

437.leslie3d: `-march=barcelona -mso -Ofast -HP:bdt=2m:heap=2m`

459.GemsFDTD: `-march=barcelona -mso -Ofast -LNO:fission=2 -LNO:prefetch_ahead=1 -CG:load_exe=0 -CG:local_sched_alg=1 -HP`

465.tonto: `-march=barcelona -mso -Ofast -OPT:alias=no_f90_pointer_alias -LNO:blocking=off -CG:load_exe=1 -IPA:plimit=525 -HP`

Benchmarks using both Fortran and C:

435.gromacs: `-march=barcelona -mso -Ofast -OPT:rsqrt=2 -HP:bdt=2m:heap=2m`

436.cactusADM: `-march=barcelona -mso -fb_create fbdata`(pass 1) `-fb_opt fbdata`(pass 2) `-Ofast -apo -LNO:prefetch_ahead=1 -HP:bdt=2m:heap=2m -LANG:heap_allocation_threshold=100`

454.calculix: `-march=barcelona -mso -Ofast -CG:load_exe=0 -CG:ptr_load_use=0 -CG:local_sched_alg=2 -CG:compute_to=on -LNO:prefetch_ahead=30 -WOPT:unroll=2 -GRA:optimize_boundary=on -HP:bdt=2m:heap=2m`

481.wrf: `-march=barcelona -mso -Ofast -LNO:blocking=off -LNO:prefetch_ahead=10 -LANG:copyinout=off -IPA:callee_limit=5000 -GRA:prioritize_by_density=on -m3dnow -HP`

The flags files that were used to format this result can be browsed at
http://www.spec.org/cpu2006/flags/x86-open64-424-flags-rate-revC.html
http://www.spec.org/cpu2006/flags/amd-platform-rate-revC.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2006/flags/x86-open64-424-flags-rate-revC.xml
http://www.spec.org/cpu2006/flags/amd-platform-rate-revC.xml

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For other inquiries, please contact webmaster@spec.org.

Tested with SPEC CPU2006 v1.1.
Report generated on Wed Jul 23 12:24:14 2014 by SPEC CPU2006 PS/PDF formatter v6932.
Originally published on 31 August 2010.