SPEC® CFP2006 Result

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Supermicro

Supermicro A+ Server AS-2022TG-HIBQRF,
AMD Opteron 6180 SE

$SPECfp®_rate2006 = $ 323

$SPECfp_rate_base2006 = $ 303

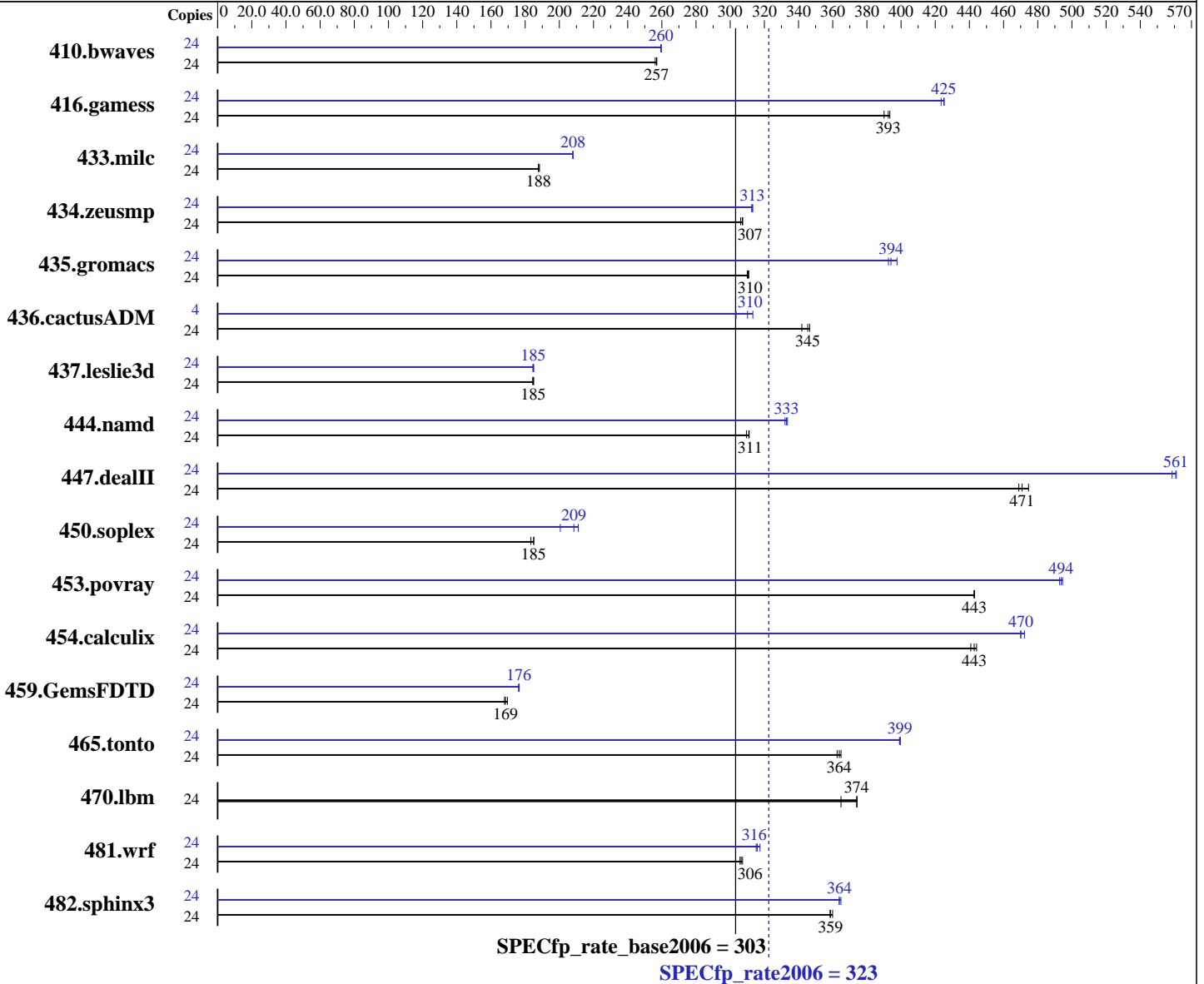|	
CPU2006 license: 001176	**Test date:** Dec-2010
Test sponsor: Supermicro	**Hardware Availability:** Feb-2011
Tested by: Supermicro	**Software Availability:** Jul-2010

SPECfp_rate_base2006 = 303

SPECfp_rate2006 = 323

Hardware

CPU Name:	AMD Opteron 6180 SE
CPU Characteristics:	
CPU MHz:	2500
FPU:	Integrated
CPU(s) enabled:	24 cores, 2 chips, 12 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

Continued on next page

Software

Operating System:	SUSE Linux Enterprise Server 11 SP1, Kernel 2.6.32.12-0.7-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

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L3 Cache:	12 MB I+D on chip per chip, 6 MB shared / 6 cores	Other Software: binutils 2.18
Other Cache:	None	
Memory:	64 GB (16 x 4 GB 2Rx8 PC3-10600R-9, ECC)	
Disk Subsystem:	1 x 500 GB SATA, 7200 RPM	
Other Hardware:	None	

Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	24	1273	256	**1270**	**257**	1269	257	24	**1257**	**260**	1257	259	1256	260
416.gamess	24	1205	390	**1197**	**393**	1194	393	24	1110	423	1105	425	**1106**	**425**
433.milc	24	1173	188	1169	188	**1173**	**188**	24	1060	208	**1059**	**208**	1059	208
434.zeusmp	24	**711**	**307**	713	306	711	307	24	697	313	**698**	**313**	699	313
435.gromacs	24	553	310	551	311	**552**	**310**	24	431	398	**435**	**394**	436	393
436.cactusADM	24	828	347	839	342	**830**	**345**	4	158	303	153	313	**154**	**310**
437.leslie3d	24	1220	185	**1221**	**185**	1224	184	24	**1221**	**185**	1219	185	1223	184
444.namd	24	622	309	619	311	**619**	**311**	24	**578**	**333**	580	332	577	334
447.dealII	24	**583**	**471**	585	469	578	475	24	489	561	**490**	**561**	491	559
450.soplex	24	1092	183	**1082**	**185**	1082	185	24	998	201	**960**	**209**	948	211
453.povray	24	288	443	288	443	**288**	**443**	24	258	495	259	493	**259**	**494**
454.calculix	24	446	444	449	441	**447**	**443**	24	421	470	**421**	**470**	419	472
459.GemsFDTD	24	1501	170	1517	168	**1511**	**169**	24	1442	177	**1444**	**176**	1445	176
465.tonto	24	**649**	**364**	647	365	651	363	24	591	400	**591**	**399**	592	399
470.lbm	24	881	374	904	365	**882**	**374**	24	881	374	904	365	**882**	**374**
481.wrf	24	877	306	**875**	**306**	873	307	24	844	317	**849**	**316**	850	315
482.sphinx3	24	1305	358	**1304**	**359**	1300	360	24	**1286**	**364**	1286	364	1282	365

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=10800 in /etc/sysctl.conf
mount -t hugetlbfs nodev /mnt/hugepages
```

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Platform Notes

```
Fan Speed set to Full Speed in BIOS Setup.
The system uses a Supermicro H8DGT-HIBQF motherboard.
```

General Notes

```
Environment variables set by runspec before the start of the run:
HUGETLB_LIMIT = "450"
LD_LIBRARY_PATH = "/usr/cpu2006/amd1002-rate-libs-revC/64:/usr/cpu2006/amd1002-rate-libs-revC/32"
OMP_NUM_THREADS = "6"

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

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
```

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Base Portability Flags (Continued)

    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

Continued on next page

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Peak Portability Flags (Continued)

```
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
```

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Peak Optimization Flags (Continued)

410.bwaves (continued):
```
-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
```

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.20100901.html
http://www.spec.org/cpu2006/flags/amd-platform-rate-revC.20110119.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.20100901.xml
http://www.spec.org/cpu2006/flags/amd-platform-rate-revC.20110119.xml

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For questions about this result, please contact the tester.
For other inquiries, please contact webmaster@spec.org.

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