SPEC® CFP2006 Result
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Supermicro

$SPECfp^{®}\_rate2006 = \quad 262$

Supermicro A+ Server AS-2022TG-HIBQRF,
AMD Opteron 6164 HE

SPECfp_rate_base2006 = 245

CPU2006 license: 001176		**Test date:**	Nov-2010
Test sponsor:	Supermicro	**Hardware Availability:**	Mar-2010
Tested by:	Supermicro	**Software Availability:**	Jul-2010

SPECfp_rate_base2006 = 245

SPECfp_rate2006 = 262

Hardware		**Software**	
CPU Name:	AMD Opteron 6164 HE	Operating System:	SUSE Linux Enterprise Server 11 SP1, Kernel 2.6.32.12-0.7-default
CPU Characteristics:			
CPU MHz:	1700	Compiler:	x86 Open64 4.2.4 Compiler Suite (from AMD)
FPU:	Integrated	Auto Parallel:	Yes
CPU(s) enabled:	24 cores, 2 chips, 12 cores/chip	File System:	ext3
CPU(s) orderable:	1,2 chips	System State:	Run level 3 (Full multiuser with network)
Primary Cache:	64 KB I + 64 KB D on chip per core	Base Pointers:	64-bit
Secondary Cache:	512 KB I+D on chip per core	Peak Pointers:	32/64-bit
Continued on next page		Continued on next page	

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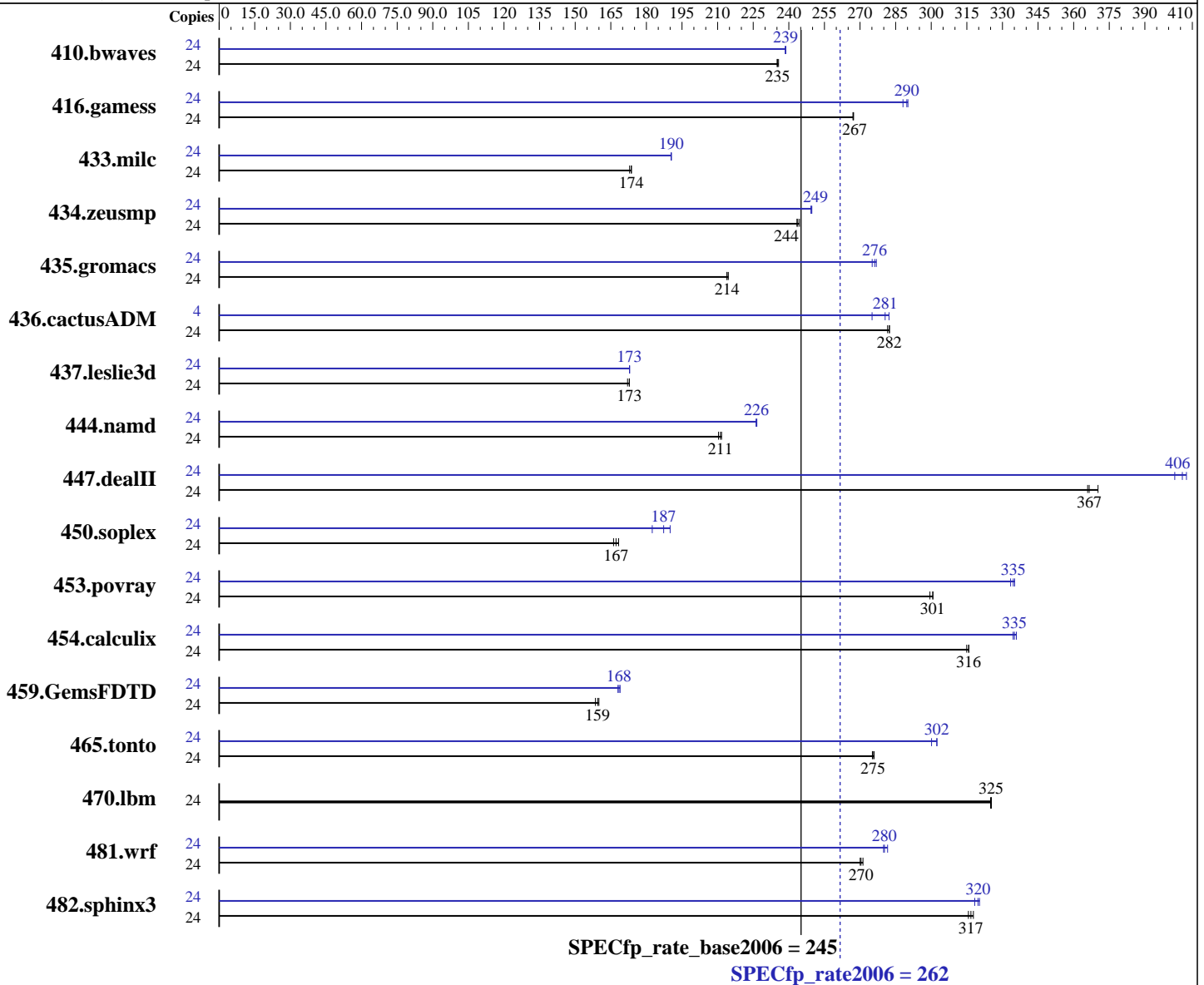|	
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L3 Cache:	12 MB I+D on chip per chip, 6 MB shared / 6 cores	Other Software: binutils 2.18
Other Cache:	None	
Memory:	64 GB (16 x 4 GB 2Rx8 PC3-10600R-9, ECC)	
Disk Subsystem:	1 x 500 GB SATA, 7200 RPM	
Other Hardware:	None	

Results Table

	Base						Peak						
Benchmark	**Copies**	**Seconds**	**Ratio**	**Seconds**	**Ratio**	**Seconds**	**Ratio**	**Copies**	**Seconds**	**Ratio**	**Seconds**	**Ratio**	**Seconds**	**Ratio**
410.bwaves	24	1388	235	1384	236	**1387**	**235**	24	1366	239	1368	238	**1367**	**239**
416.gamess	24	1760	267	**1759**	**267**	1758	267	24	1619	290	1631	288	**1622**	**290**
433.milc	24	1274	173	**1269**	**174**	1268	174	24	**1157**	**190**	1157	190	1157	190
434.zeusmp	24	893	244	897	243	**896**	**244**	24	**876**	**249**	876	249	875	250
435.gromacs	24	799	215	801	214	**801**	**214**	24	623	275	**620**	**276**	619	277
436.cactusADM	24	**1016**	**282**	1016	282	1018	282	4	**170**	**281**	174	275	169	282
437.leslie3d	24	**1306**	**173**	1305	173	1311	172	24	**1305**	**173**	1304	173	1305	173
444.namd	24	915	210	909	212	**911**	**211**	24	850	227	851	226	**850**	**226**
447.dealII	24	742	370	750	366	**749**	**367**	24	682	403	674	408	**677**	**406**
450.soplex	24	1205	166	1189	168	**1197**	**167**	24	1097	182	**1069**	**187**	1053	190
453.povray	24	**425**	**301**	426	299	425	301	24	381	335	**382**	**335**	383	333
454.calculix	24	629	315	**627**	**316**	627	316	24	592	335	**591**	**335**	590	336
459.GemsFDTD	24	1606	159	1592	160	**1597**	**159**	24	1507	169	1516	168	**1511**	**168**
465.tonto	24	**857**	**275**	858	275	856	276	24	787	300	781	302	**781**	**302**
470.lbm	24	**1014**	**325**	1015	325	1014	325	24	**1014**	**325**	1015	325	1014	325
481.wrf	24	**991**	**270**	988	271	993	270	24	**956**	**280**	952	282	958	280
482.sphinx3	24	1482	316	1472	318	**1477**	**317**	24	1469	318	1460	320	**1463**	**320**

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

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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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