



# SPEC® CFP2006 Result

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## Supermicro

(Test Sponsor: Advanced Micro Devices)

SPECfp®\_rate2006 = 77.3

A+ Server 1021M-UR+B, AMD Opteron 2347 HE

SPECfp\_rate\_base2006 = 70.5

CPU2006 license: 49

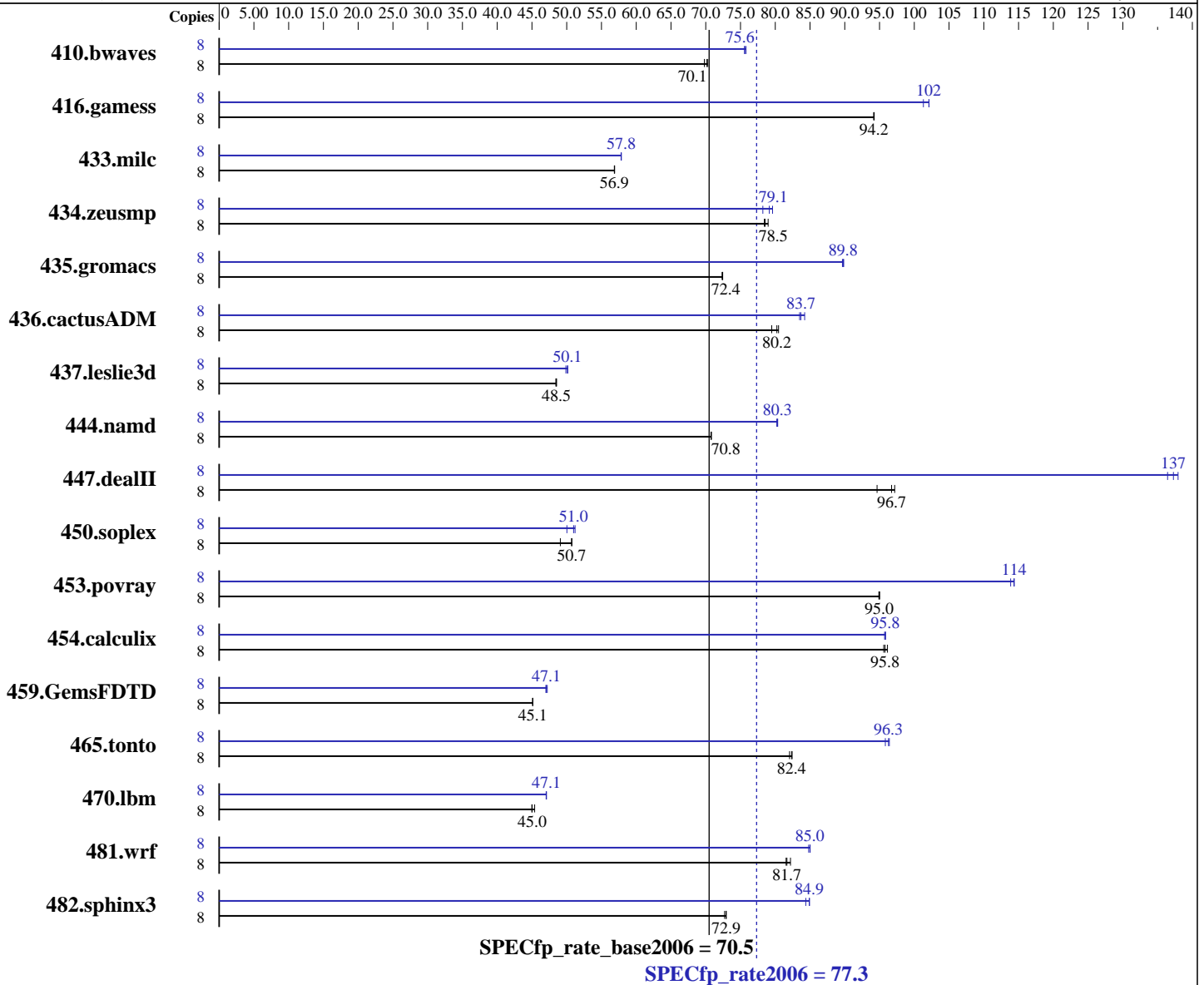
Test sponsor: Advanced Micro Devices

Tested by: Advanced Micro Devices

Test date: Mar-2008

Hardware Availability: May-2008

Software Availability: May-2008



### Hardware

CPU Name: AMD Opteron 2347 HE  
 CPU Characteristics:  
 CPU MHz: 1900  
 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 10 (x86\_64) SP1, Kernel 2.6.16.46-0.12-smp  
 Compiler: PGI Server Complete Version 7.2 PathScale Compiler Suite Version 3.1  
 Auto Parallel: No  
 File System: ReiserFS  
 System State: Runlevel 3 (Full multiuser with network)  
 Base Pointers: 64-bit  
 Peak Pointers: 32/64-bit

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L3 Cache: 2 MB I+D on chip per chip  
Other Cache: None  
Memory: 16 GB (8x2GB, DDR2-667, CL5, Reg, Dual Rank)  
Disk Subsystem: 1 x 300 GB SATA, 7200 RPM  
Other Hardware: None

Other Software: None

## Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	8	1558	69.8	1547	70.3	<b>1550</b>	<b>70.1</b>	8	1434	75.8	1439	75.6	<b>1438</b>	<b>75.6</b>
416.gamess	8	1662	94.2	1664	94.2	<b>1663</b>	<b>94.2</b>	8	<b>1534</b>	<b>102</b>	1546	101	1534	102
433.milc	8	<b>1292</b>	<b>56.9</b>	1292	56.9	1291	56.9	8	<b>1270</b>	<b>57.8</b>	1270	57.8	1269	57.9
434.zeusmp	8	922	79.0	<b>927</b>	<b>78.5</b>	928	78.4	8	914	79.6	<b>920</b>	<b>79.1</b>	931	78.2
435.gromacs	8	790	72.3	<b>789</b>	<b>72.4</b>	789	72.4	8	637	89.7	<b>636</b>	<b>89.8</b>	636	89.8
436.cactusADM	8	1203	79.5	<b>1192</b>	<b>80.2</b>	1188	80.5	8	1145	83.5	<b>1142</b>	<b>83.7</b>	1135	84.2
437.leslie3d	8	1549	48.5	<b>1551</b>	<b>48.5</b>	1553	48.4	8	1499	50.2	<b>1501</b>	<b>50.1</b>	1508	49.9
444.namd	8	906	70.8	907	70.7	<b>906</b>	<b>70.8</b>	8	800	80.2	<b>799</b>	<b>80.3</b>	798	80.4
447.dealII	8	967	94.6	942	97.2	<b>946</b>	<b>96.7</b>	8	663	138	<b>667</b>	<b>137</b>	671	136
450.soplex	8	1359	49.1	1315	50.7	<b>1316</b>	<b>50.7</b>	8	1334	50.0	<b>1308</b>	<b>51.0</b>	1303	51.2
453.povray	8	448	94.9	<b>448</b>	<b>95.0</b>	448	95.0	8	374	114	<b>372</b>	<b>114</b>	372	114
454.calculix	8	686	96.1	<b>689</b>	<b>95.8</b>	690	95.6	8	<b>689</b>	<b>95.8</b>	688	95.9	689	95.7
459.GemsFDTD	8	1881	45.1	1882	45.1	<b>1881</b>	<b>45.1</b>	8	1806	47.0	1798	47.2	<b>1803</b>	<b>47.1</b>
465.tonto	8	959	82.1	955	82.4	<b>956</b>	<b>82.4</b>	8	821	95.8	<b>818</b>	<b>96.3</b>	816	96.4
470.lbm	8	2444	45.0	2422	45.4	<b>2441</b>	<b>45.0</b>	8	2337	47.0	2335	47.1	<b>2335</b>	<b>47.1</b>
481.wrf	8	1087	82.2	1096	81.6	<b>1094</b>	<b>81.7</b>	8	1054	84.8	<b>1051</b>	<b>85.0</b>	1051	85.0
482.sphinx3	8	2144	72.7	<b>2138</b>	<b>72.9</b>	2138	72.9	8	1847	84.4	<b>1837</b>	<b>84.9</b>	1836	84.9

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

## Operating System Notes

'numactl' was used to bind copies to the cores  
Environment variable PGI\_HUGE\_PAGES set to 150  
'ulimit -s unlimited' was used to set environment stack size  
'ulimit -l 2457600' was used to set environment locked pages in memory quantity  
Set vm/nr\_hugepages=1200 in /etc/sysctl.conf  
mount -t hugetlbfs nodev /mnt/hugepages

## Base Compiler Invocation

C benchmarks:  
pgcc

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Hardware Availability: May-2008

Software Availability: May-2008

## Base Compiler Invocation (Continued)

C++ benchmarks:

pgcpp

Fortran benchmarks:

pgf95

Benchmarks using both Fortran and C:

pgcc pgf95

## 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 -Mnomain
436.cactusADM: -DSPEC_CPU_LP64 -Mnomain
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 -Mnomain
459.GemsFDTD: -DSPEC_CPU_LP64
465.tonto: -DSPEC_CPU_LP64
470.lbm: -DSPEC_CPU_LP64
481.wrf: -DSPEC_CPU_LP64 -DSPEC_CPU_CASE_FLAG -DSPEC_CPU_LINUX
482.sphinx3: -DSPEC_CPU_LP64

```

## Base Optimization Flags

C benchmarks:

```

-fast -Mipa=jobs:4 -Mipa=fast -Mipa=inline -Mfprelaxed
-Msmartalloc=huge:150 -tp barcelona-64 -Bstatic_pgi

```

C++ benchmarks:

```

-fast -Mipa=jobs:4 -Mipa=fast -Mipa=inline -Mfprelaxed
-Msmartalloc=huge:150 --zc_eh -tp barcelona-64 -Bstatic_pgi

```

Fortran benchmarks:

```

-fast -Mipa=jobs:4 -Mipa=fast -Mipa=inline -Mfprelaxed
-Msmartalloc=huge:150 -tp barcelona-64 -Bstatic_pgi

```

Benchmarks using both Fortran and C:

```

-fast -Mipa=jobs:4 -Mipa=fast -Mipa=inline -Mfprelaxed
-Msmartalloc=huge:150 -tp barcelona-64 -Bstatic_pgi

```



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## Base Other Flags

C benchmarks:

-w

C++ benchmarks:

-w

Fortran benchmarks:

-w

Benchmarks using both Fortran and C:

-w

## Peak Compiler Invocation

C benchmarks (except as noted below):

pathcc

433.milc: pgcc

C++ benchmarks (except as noted below):

pathCC

444.namd: pgcpp

Fortran benchmarks (except as noted below):

pathf95

410.bwaves: pgf95

434.zeusmp: pgf95

Benchmarks using both Fortran and C (except as noted below):

pgcc pgf95

436.cactusADM: pathcc pathf95

481.wrf: pathcc pathf95

## 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 -Mnomain

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## Peak Portability Flags (Continued)

```

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 -Mnomain
459.GemsFDTD: -DSPEC_CPU_LP64
465.tonto: -DSPEC_CPU_LP64
470.lbm: -DSPEC_CPU_LP64
481.wrf: -DSPEC_CPU_LP64 -DSPEC_CPU_LINUX -fno-second-underscore
482.sphinx3: -DSPEC_CPU_LP64

```

## Peak Optimization Flags

### C benchmarks:

```

433.milc: -fastsse -Msmartalloc=huge:150 -Msafeptr -Mfprelaxed
-Mipa=jobs:4 -Mipa=inline -Mipa=arg -Mipa=const -Mipa=ptr
-Mipa=shape -tp barcelona-64 -Bstatic_pgi

```

```

470.lbm: -march=barcelona -Ofast -m3dnow

```

```

482.sphinx3: -march=barcelona -Ofast

```

### C++ benchmarks:

```

444.namd: -Mphi(pass 1) -Mipa=jobs:4(pass 2) -Mipa=fast(pass 2)
-Mipa=inline(pass 2) -Mpfo(pass 2) -fast -Mfprelaxed
-Msmartalloc=huge:150 --zc_eh -Mnodepchk -Munroll=n:4
-Munroll=m:8 -tp barcelona-64 -Bstatic_pgi

```

```

447.deallI: -march=barcelona -Ofast -static -INLINE:aggressive=on
-OPT:malloc_alg=1 -m32 -fno-exceptions

```

```

450.soplex: -march=barcelona -fb_create fbdata(pass 1)
-fb_opt fbdata(pass 2) -m32 -O3 -TENV:frame_pointer=off
-LNO:prefetch=1

```

```

453.povray: -march=barcelona -fb_create fbdata(pass 1)
-fb_opt fbdata(pass 2) -Ofast -CG:load_exe=0

```

### Fortran benchmarks:

```

410.bwaves: -Mphi(pass 1) -Mipa=jobs:4(pass 2) -Mipa=fast(pass 2)
-Mipa=inline(pass 2) -Mpfo(pass 2) -fastsse -Mfprelaxed
-Msmartalloc -Mprefetch=distance:12 -Mprefetch=nta
-tp barcelona-64 -Bstatic_pgi

```

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## Peak Optimization Flags (Continued)

416.gamess: -march=barcelona -fb\_create fbdata(pass 1)  
-fb\_opt fbdata(pass 2) -O2 -OPT:Ofast -OPT:ro=3  
-OPT:unroll\_size=256

434.zeusmp: -fastsse -Mfprelaxed -Msmartalloc=huge:150 -Mipa=jobs:4  
-Mipa=fast -Mipa=inline -tp barcelona-64 -Bstatic\_pgi

437.leslie3d: -march=barcelona -Ofast -m3dnow -OPT:unroll\_size=256  
-CG:load\_exe=0 -OPT:malloc\_alg=1

459.GemsFDTD: -march=barcelona -Ofast -LNO:fission=2 -LNO:simd=2  
-OPT:malloc\_alg=1

465.tonto: -march=barcelona -Ofast -OPT:malloc\_alg=1  
-OPT:alias=no\_f90\_pointer\_alias -LNO:blocking=off  
-CG:load\_exe=1 -IPA:plimit=525

Benchmarks using both Fortran and C:

435.gromacs: -fast -Mfpapprox=rsqrt -Mipa=jobs:4 -Mipa=fast  
-Mipa=inline -Mfprelaxed -Msmartalloc=huge:150  
-tp barcelona-64 -Bstatic\_pgi

436.cactusADM: -march=barcelona -fb\_create fbdata(pass 1)  
-fb\_opt fbdata(pass 2) -Ofast -WOPT:aggstr=0

454.calculix: -fastsse -Mfprelaxed -Msmartalloc=huge:150 -Mipa=jobs:4  
-Mipa=fast -Mipa=inline -tp barcelona-64 -Bstatic\_pgi

481.wrf: -march=barcelona -Ofast -LNO:blocking=off  
-LNO:prefetch\_ahead=10 -OPT:malloc\_alg=1 -m3dnow  
-LANG:copyinout=off -IPA:callee\_limit=5000

## Peak Other Flags

C benchmarks:

433.milc: -w

C++ benchmarks:

444.namd: -w

Fortran benchmarks:

410.bwaves: -w

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## Peak Other Flags (Continued)

434.zeusmp: -w

Benchmarks using both Fortran and C:

435.gromacs: -w

454.calculix: -w

The flags file that was used to format this result can be browsed at

<http://www.spec.org/cpu2006/flags/amd123GH-flags.20090713.html>

You can also download the XML flags source by saving the following link:

<http://www.spec.org/cpu2006/flags/amd123GH-flags.20090713.xml>

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For other inquiries, please contact [webmaster@spec.org](mailto:webmaster@spec.org).

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