



# SPEC® CFP2006 Result

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## Supermicro

SPECfp®2006 = **23.6**

## H8DA3-2 , AMD Opteron 2386 SE

SPECfp\_base2006 = 19.4

CPU2006 license: 001176

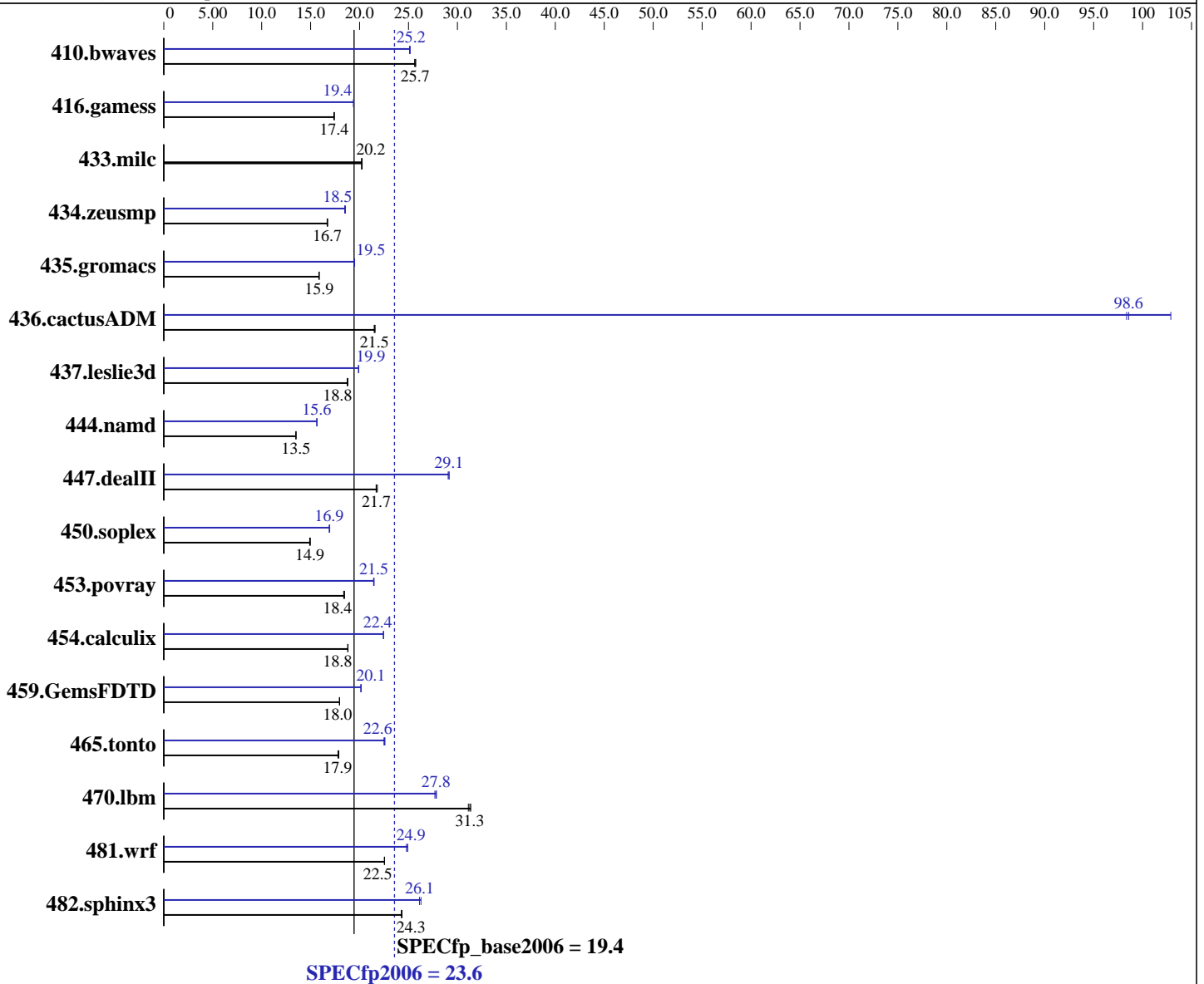
Test date: Feb-2009

Test sponsor: Supermicro

Hardware Availability: Feb-2009

Tested by: Supermicro

Software Availability: Jun-2008



### Hardware

CPU Name: AMD Opteron 2386 SE  
 CPU Characteristics:  
 CPU MHz: 2800  
 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) SP2, Kernel 2.6.16.60-0.21-smp  
 Compiler: PGI Server Complete Version 7.2 PathScale Compiler Suite Version 3.2  
 Auto Parallel: Yes  
 File System: ReiserFS  
 System State: Run level 3 (multi-user)  
 Base Pointers: 64-bit  
 Peak Pointers: 32/64-bit

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L3 Cache: 6 MB I+D on chip per chip  
 Other Cache: None  
 Memory: 32 GB (8x4 GB, DDR2-800, CL5, Reg, Dual Rank)  
 Disk Subsystem: 1 x 160 GB SATA II, 7200 RPM  
 Other Hardware: None

Other Software: binutils 2.18  
 32-bit and 64-bit libhugetlbfs libraries

## Results Table

Benchmark	Base						Peak					
	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	530	25.6	<b>529</b>	<b>25.7</b>	528	25.7	541	25.1	540	25.2	<b>540</b>	<b>25.2</b>
416.gamess	1124	17.4	1127	17.4	<b>1124</b>	<b>17.4</b>	1010	19.4	1009	19.4	<b>1010</b>	<b>19.4</b>
433.milc	455	20.2	<b>453</b>	<b>20.2</b>	453	20.3	455	20.2	<b>453</b>	<b>20.2</b>	453	20.3
434.zeusmp	<b>545</b>	<b>16.7</b>	545	16.7	543	16.7	<b>492</b>	<b>18.5</b>	492	18.5	490	18.6
435.gromacs	<b>450</b>	<b>15.9</b>	451	15.8	450	15.9	<b>366</b>	<b>19.5</b>	367	19.4	366	19.5
436.cactusADM	556	21.5	<b>555</b>	<b>21.5</b>	553	21.6	121	98.4	<b>121</b>	<b>98.6</b>	116	103
437.leslie3d	500	18.8	502	18.7	<b>501</b>	<b>18.8</b>	472	19.9	<b>472</b>	<b>19.9</b>	473	19.9
444.namd	594	13.5	594	13.5	<b>594</b>	<b>13.5</b>	<b>513</b>	<b>15.6</b>	512	15.7	513	15.6
447.dealII	524	21.8	<b>527</b>	<b>21.7</b>	527	21.7	394	29.1	392	29.1	<b>393</b>	<b>29.1</b>
450.soplex	<b>559</b>	<b>14.9</b>	560	14.9	557	15.0	493	16.9	<b>493</b>	<b>16.9</b>	492	17.0
453.povray	<b>288</b>	<b>18.4</b>	288	18.5	289	18.4	248	21.5	<b>248</b>	<b>21.5</b>	248	21.4
454.calculix	439	18.8	438	18.8	<b>439</b>	<b>18.8</b>	368	22.4	<b>368</b>	<b>22.4</b>	367	22.5
459.GemsFDTD	591	17.9	<b>591</b>	<b>18.0</b>	591	18.0	527	20.1	526	20.2	<b>527</b>	<b>20.1</b>
465.tonto	553	17.8	<b>551</b>	<b>17.9</b>	551	17.9	437	22.5	<b>436</b>	<b>22.6</b>	436	22.6
470.lbm	<b>439</b>	<b>31.3</b>	438	31.4	442	31.1	493	27.9	496	27.7	<b>494</b>	<b>27.8</b>
481.wrf	<b>495</b>	<b>22.5</b>	495	22.6	496	22.5	448	24.9	<b>448</b>	<b>24.9</b>	451	24.8
482.sphinx3	803	24.3	801	24.3	<b>802</b>	<b>24.3</b>	742	26.3	746	26.1	<b>746</b>	<b>26.1</b>

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

## Operating System Notes

The libhugetlbfs libraries were installed using the installation rpms that came with the distribution.

'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



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## General Notes

Environment variables set by runspec before the start of the run:

HUGETLB\_MORECORE = "yes"

LD\_LIBRARY\_PATH = "/usr/cpu2006/amd909gh-libs/64:/usr/cpu2006/amd909gh-libs/32"

NCPUS = "8"

Tested system is built in open environment,  
to ensure system stability, a 550W (minimum) ATX power  
[4-pin (+12V), 8-pin (+12V) and 24-pin are required]  
Product description can be obtained at  
<http://www.supermicro.com/Aplus/motherboard/Opteron2000/MCP55/H8DA3-2.cfm>

## Base Compiler Invocation

C benchmarks:

pgcc

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



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## Base Optimization Flags

C benchmarks:

-Mvect=cachesize:6291456 -fastsse -Msmartalloc=huge -Mfprelaxed  
-Mipa=fast -Mipa=inline -tp barcelona-64 -Bstatic\_pgi

C++ benchmarks:

-Mvect=cachesize:6291456 -fastsse -Msmartalloc=huge -Mfprelaxed  
--zc\_eh -Mipa=fast -Mipa=inline -tp barcelona-64 -Bstatic\_pgi

Fortran benchmarks:

-Mvect=cachesize:6291456 -fastsse -Mfprelaxed -Msmartalloc=huge  
-Mipa=fast -Mipa=inline -tp barcelona-64 -Bstatic\_pgi

Benchmarks using both Fortran and C:

-Mvect=cachesize:6291456 -fastsse -Msmartalloc=huge -Mfprelaxed  
-Mipa=fast -Mipa=inline -tp barcelona-64 -Bstatic\_pgi

## Base Other Flags

C benchmarks:

-Mipa=jobs:4

C++ benchmarks:

-Mipa=jobs:4

Fortran benchmarks:

-Mipa=jobs:4

Benchmarks using both Fortran and C:

-Mipa=jobs:4

## Peak Compiler Invocation

C benchmarks:

pgcc

C++ benchmarks (except as noted below):

pathCC

444.namd: pgcpp

Fortran benchmarks (except as noted below):

pathf95

410.bwaves: pgf95

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Hardware Availability: Feb-2009

Tested by: Supermicro

Software Availability: Jun-2008

## Peak Compiler Invocation (Continued)

434.zeusmp: pgf95

437.leslie3d: pgf95

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

pgcc pgf95

435.gromacs: 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

436.cactusADM: -DSPEC\_CPU\_LP64 -Mnomain

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: basepeak = yes

470.lbm: -Mvect=cachesize:6291456 -fastsse -Msmartalloc=huge

-Mprefetch=t0 -Mloop32 -Mfprelaxed -Mipa=fast -Mipa=inline

-tp barcelona-64 -Bstatic\_pgi

482.sphinx3: -Mphi=indirect(pass 1) -Mpfo=indirect(pass 2)

-Mipa=fast(pass 2) -Mipa=inline(pass 2)

-Mvect=cachesize:6291456 -fastsse -Mfprelaxed -Msmartalloc

-tp barcelona-64 -Bstatic\_pgi

C++ benchmarks:

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## Peak Optimization Flags (Continued)

444.namd: -Mpfi(pass 1) -Mpfo(pass 2) -Mipa=fast(pass 2)  
-Mipa=inline(pass 2) -Mvect=cachesize:6291456 -fastsse  
-Munroll=n:4 -Munroll=m:8 -Msmartalloc=huge -Mnodepch  
-Mfprelaxed --zc\_eh -tp barcelona-64 -Bstatic\_pgi

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

450.soplex: -march=barcelona -fb\_create fbdata(pass 1)  
-fb\_opt fbdata(pass 2) -L/usr/lib -lhugetlbfs(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

453.povray: -march=barcelona -fb\_create fbdata(pass 1)  
-fb\_opt fbdata(pass 2) -Ofast -INLINE:aggressive=on

### Fortran benchmarks:

410.bwaves: -Mvect=cachesize:6291456 -fastsse -Msmartalloc  
-Mprefetch=nta -Mfprelaxed -Mipa=fast -Mipa=inline  
-tp barcelona-64 -Bstatic\_pgi

416.gamess: -march=barcelona -fb\_create fbdata(pass 1)  
-fb\_opt fbdata(pass 2)  
-Wl,-T/usr/share/libhugetlbfs/ldscripts/elf\_x86\_64.xBDT(pass 2)  
-L/usr/lib64 -lhugetlbfs(pass 2) -O2 -OPT:Ofast -OPT:ro=3  
-OPT:unroll\_size=256

434.zeusmp: -Mvect=cachesize:6291456 -fastsse -Mfprelaxed  
-Mprefetch=distance:8 -Mprefetch=t0 -Msmartalloc=huge  
-Msmartalloc=hugebss -Mipa=fast -Mipa=inline  
-tp barcelona-64 -Bstatic\_pgi

437.leslie3d: -Mpfi=indirect(pass 1) -Mpfo=indirect(pass 2)  
-Mipa=fast(pass 2) -Mipa=inline(pass 2)  
-Mvect=cachesize:6291456 -fastsse -Mvect=fuse  
-Msmartalloc=huge -Mprefetch=distance:8 -Mprefetch=t0  
-Mfprelaxed -tp barcelona-64 -Bstatic\_pgi

459.GemsFDTD: -march=barcelona -Ofast -LNO:fission=2 -LNO:simd=2  
-LNO:prefetch\_ahead=1 -CG:load\_exe=0 -CG:prefer\_lru\_reg=off  
-OPT:malloc\_alg=1  
-Wl,-T/usr/share/libhugetlbfs/ldscripts/elf\_x86\_64.xBDT  
-L/usr/lib64 -lhugetlbfs

465.tonto: -march=barcelona -Ofast -OPT:alias=no\_f90\_pointer\_alias  
-LNO:blocking=off -CG:load\_exe=1 -IPA:plimit=525  
-OPT:malloc\_alg=1  
-Wl,-T/usr/share/libhugetlbfs/ldscripts/elf\_x86\_64.xBDT  
-L/usr/lib64 -lhugetlbfs

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## Peak Optimization Flags (Continued)

Benchmarks using both Fortran and C:

435.gromacs: -march=barcelona -Ofast -OPT:rsqrt=2 -OPT:malloc\_alg=1  
-Wl,-T/usr/share/libhugetlbfs/ldscripts/elf\_x86\_64.xBDT  
-L/usr/lib64 -lhugetlbfs

436.cactusADM: -Mvect=cachesize:6291456 -fastsse -Mconcur  
-Msmartalloc=huge -Mfprelaxed -Mipa=fast -Mipa=inline  
-tp barcelona-64 -Bstatic\_pgi

454.calculix: -Mphi=indirect(pass 1) -Mpfo=indirect(pass 2)  
-Mipa=fast(pass 2) -Mipa=inline(pass 2)  
-Mvect=cachesize:6291456 -fastsse -Msmartalloc=huge  
-Mprefetch=t0 -Mpre -Mfprelaxed -tp barcelona-64  
-Bstatic\_pgi

481.wrf: -march=barcelona -Ofast -LNO:blocking=off  
-LNO:prefetch\_ahead=10 -LANG:copyinout=off  
-IPA:callee\_limit=5000 -GRA:prioritize\_by\_density=on  
-OPT:malloc\_alg=1 -m3dnow  
-Wl,-T/usr/share/libhugetlbfs/ldscripts/elf\_x86\_64.xBDT  
-L/usr/lib64 -lhugetlbfs

## Peak Other Flags

C benchmarks:

-Mipa=jobs:4(pass 2)

C++ benchmarks:

444.namd: -Mipa=jobs:4(pass 2)

Fortran benchmarks (except as noted below):

-Mipa=jobs:4(pass 2)

416.gamess: No flags used

459.GemsFDTD: No flags used

465.tonto: No flags used

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

-Mipa=jobs:4(pass 2)

435.gromacs: No flags used

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## Peak Other Flags (Continued)

481.wrf: No flags used

The flags files that were used to format this result can be browsed at

[http://www.spec.org/cpu2006/flags/CPU2006\\_flags.20090710.html](http://www.spec.org/cpu2006/flags/CPU2006_flags.20090710.html)

<http://www.spec.org/cpu2006/flags/amd-platform-amd909gh.html>

[http://www.spec.org/cpu2006/flags/pgi72\\_linux\\_flags.html](http://www.spec.org/cpu2006/flags/pgi72_linux_flags.html)

You can also download the XML flags sources by saving the following links:

[http://www.spec.org/cpu2006/flags/CPU2006\\_flags.20090710.xml](http://www.spec.org/cpu2006/flags/CPU2006_flags.20090710.xml)

<http://www.spec.org/cpu2006/flags/amd-platform-amd909gh.xml>

[http://www.spec.org/cpu2006/flags/pgi72\\_linux\\_flags.xml](http://www.spec.org/cpu2006/flags/pgi72_linux_flags.xml)

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