



# SPEC<sup>®</sup> CFP2006 Result

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## Supermicro

Supermicro SuperBlade SBA-7222G-T2, AMD Opteron 6166 HE

SPECfp<sup>®</sup>\_rate2006 = 272

SPECfp\_rate\_base2006 = 256

CPU2006 license: 001176

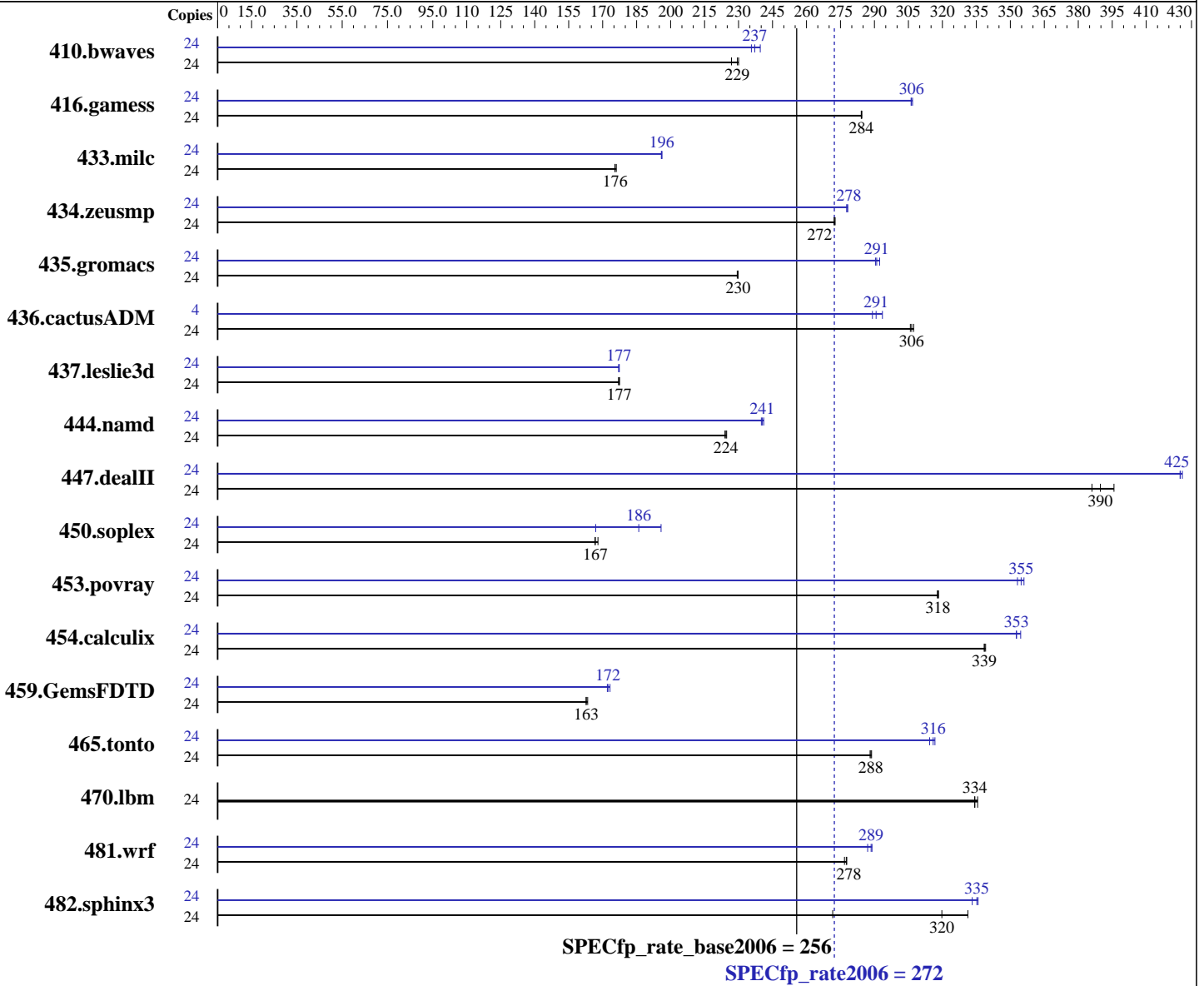
Test sponsor: Supermicro

Tested by: Supermicro

Test date: Jul-2011

Hardware Availability: Sep-2010

Software Availability: Jul-2011



### Hardware

CPU Name: AMD Opteron 6166 HE  
 CPU Characteristics:  
 CPU MHz: 1800  
 FPU: Integrated  
 CPU(s) enabled: 24 cores, 2 chips, 12 cores/chip  
 CPU(s) orderable: 1 chip  
 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: Red Hat Enterprise Linux Server release 6.1, Advanced Platform with patch RHSA-2009:1670, Kernel 2.6.32-131.0.15.el6  
 Compiler: C/C++: Version 4.2.4 of Open64 Compiler Suite (from AMD)  
 Auto Parallel: Yes  
 File System: ext4  
 System State: Run level 3 (Full multiuser with network)  
 Base Pointers: 64-bit

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L3 Cache: 12 MB I+D on chip per chip, 6 MB shared / 6 cores  
Other Cache: None  
Memory: 64 GB (8 x 8 GB 2Rx4 PC3-10600R-9, ECC)  
Disk Subsystem: 1 x 300 GB SATA, 7200 RPM  
Other Hardware: None

Peak Pointers: 32/64-bit  
Other Software: None

## Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	24	<u>1421</u>	<u>229</u>	1418	230	1438	227	24	1384	236	<u>1375</u>	<u>237</u>	1361	240
416.gamess	24	1652	284	<u>1653</u>	<u>284</u>	1654	284	24	<u>1534</u>	<u>306</u>	1532	307	1535	306
433.milc	24	1252	176	1256	175	<u>1255</u>	<u>176</u>	24	<u>1123</u>	<u>196</u>	1125	196	1123	196
434.zeusmp	24	802	272	801	273	<u>802</u>	<u>272</u>	24	785	278	786	278	<u>786</u>	<u>278</u>
435.gromacs	24	747	229	746	230	<u>746</u>	<u>230</u>	24	586	292	<u>589</u>	<u>291</u>	590	290
436.cactusADM	24	933	307	938	306	<u>936</u>	<u>306</u>	4	<u>164</u>	<u>291</u>	163	294	165	289
437.leslie3d	24	1272	177	1275	177	<u>1272</u>	<u>177</u>	24	1272	177	1274	177	<u>1273</u>	<u>177</u>
444.namd	24	859	224	<u>858</u>	<u>224</u>	856	225	24	802	240	<u>800</u>	<u>241</u>	798	241
447.dealII	24	694	396	711	386	<u>704</u>	<u>390</u>	24	<u>646</u>	<u>425</u>	646	425	645	426
450.soplex	24	1201	167	<u>1200</u>	<u>167</u>	1192	168	24	1199	167	<u>1076</u>	<u>186</u>	1022	196
453.povray	24	<u>401</u>	<u>318</u>	401	318	402	318	24	362	353	<u>360</u>	<u>355</u>	359	356
454.calculix	24	585	339	<u>585</u>	<u>339</u>	584	339	24	561	353	<u>561</u>	<u>353</u>	558	355
459.GemsFDTD	24	<u>1564</u>	<u>163</u>	1565	163	1558	163	24	<u>1477</u>	<u>172</u>	1470	173	1480	172
465.tonto	24	820	288	818	289	<u>819</u>	<u>288</u>	24	751	314	746	317	<u>747</u>	<u>316</u>
470.lbm	24	983	336	<u>986</u>	<u>334</u>	986	334	24	983	336	<u>986</u>	<u>334</u>	986	334
481.wrf	24	965	278	<u>966</u>	<u>278</u>	969	277	24	934	287	928	289	<u>929</u>	<u>289</u>
482.sphinx3	24	1722	272	1412	331	<u>1463</u>	<u>320</u>	24	1404	333	1393	336	<u>1395</u>	<u>335</u>

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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## General Notes

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

HUGETLB\_LIMIT = "450"

LD\_LIBRARY\_PATH = "/spec/amd1002-rate-libs-revC/64:/spec/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>

Binaries were compiled on RHEL 5.5 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



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## 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  
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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  
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## 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.deallI: -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

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## 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/amd-platform-rate-revC.html>

<http://www.spec.org/cpu2006/flags/x86-open64-424-flags-rate-revC.20100901.html>

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

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

<http://www.spec.org/cpu2006/flags/x86-open64-424-flags-rate-revC.20100901.xml>

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

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