



# SPEC<sup>®</sup> CFP2006 Result

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## IBM Corporation

SPECfp<sup>®</sup>\_rate2006 = 260

IBM System x3755 M3 (AMD Opteron 6136)

SPECfp\_rate\_base2006 = 234

CPU2006 license: 11

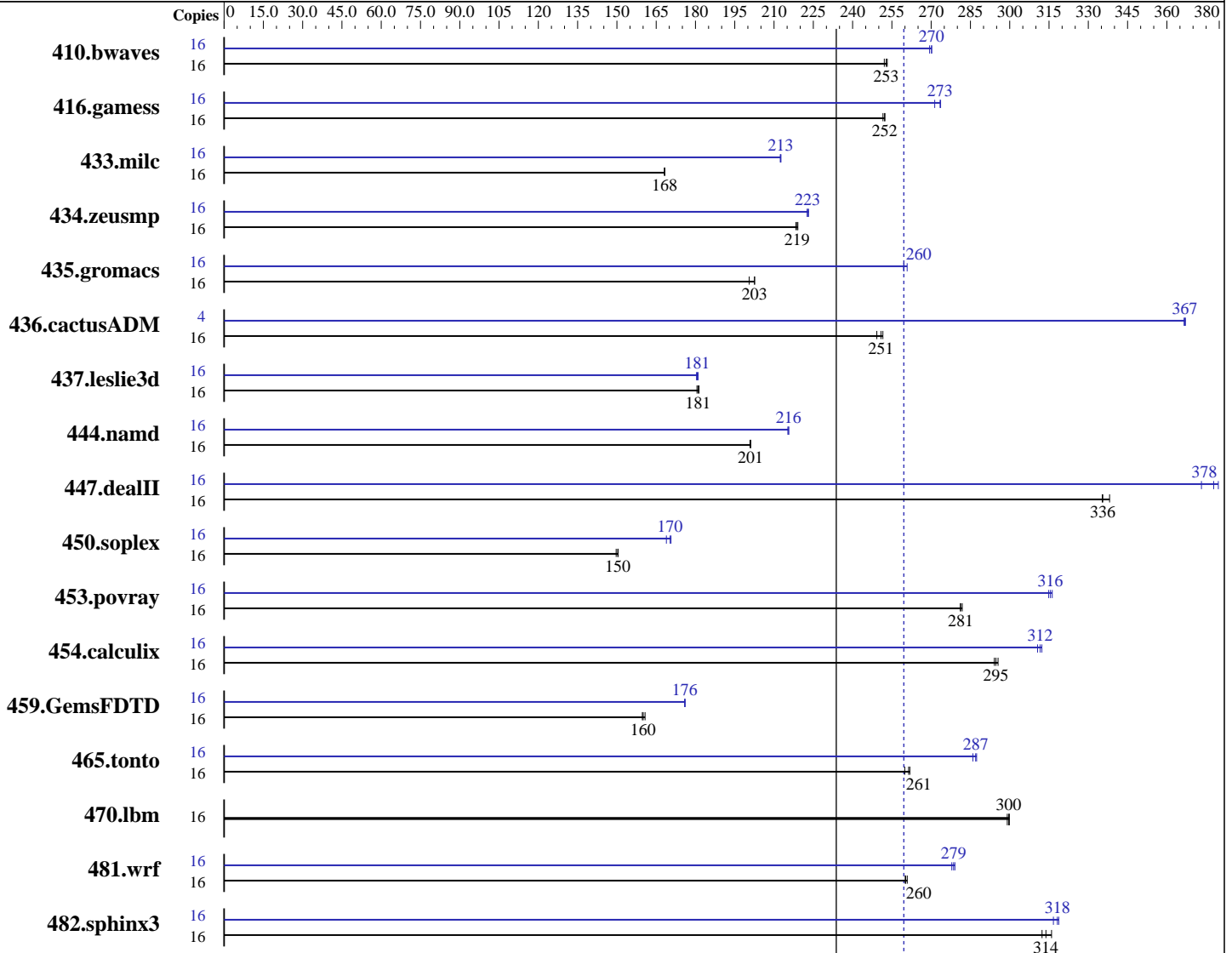
Test date: Jul-2011

Test sponsor: IBM Corporation

Hardware Availability: Dec-2010

Tested by: IBM Corporation

Software Availability: Jul-2010



SPECfp\_rate\_base2006 = 234

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### Hardware

CPU Name: AMD Opteron 6136  
 CPU Characteristics:  
 CPU MHz: 2400  
 FPU: Integrated  
 CPU(s) enabled: 16 cores, 2 chips, 8 cores/chip  
 CPU(s) orderable: 2,4 chips  
 Primary Cache: 64 KB I + 64 KB D on chip per core  
 Secondary Cache: 512 KB I+D on chip per core

### Software

Operating System: SUSE Linux Enterprise Server 11 SP1 (x86\_64), 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  
 Other Software: None

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L3 Cache: 12 MB I+D on chip per chip, 6 MB shared / 4 cores  
 Other Cache: None  
 Memory: 64 GB (16 x 4 GB 2Rx4 PC3-10600R-9, ECC)  
 Disk Subsystem: 1 x 250 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	16	863	252	<b>860</b>	<b>253</b>	859	253	16	<b>805</b>	<b>270</b>	807	269	805	270
416.gamess	16	<b>1242</b>	<b>252</b>	1242	252	1245	252	16	1154	271	<b>1146</b>	<b>273</b>	1145	274
433.milc	16	873	168	<b>873</b>	<b>168</b>	874	168	16	692	212	<b>691</b>	<b>213</b>	691	213
434.zeusmp	16	665	219	667	218	<b>665</b>	<b>219</b>	16	654	223	<b>653</b>	<b>223</b>	652	223
435.gromacs	16	570	201	<b>564</b>	<b>203</b>	564	203	16	<b>440</b>	<b>260</b>	438	261	440	260
436.cactusADM	16	767	249	760	252	<b>762</b>	<b>251</b>	4	130	367	130	367	<b>130</b>	<b>367</b>
437.leslie3d	16	833	181	829	181	<b>831</b>	<b>181</b>	16	834	180	<b>832</b>	<b>181</b>	831	181
444.namd	16	639	201	<b>638</b>	<b>201</b>	638	201	16	596	215	595	216	<b>595</b>	<b>216</b>
447.dealII	16	541	338	<b>546</b>	<b>336</b>	546	335	16	<b>484</b>	<b>378</b>	482	380	490	373
450.soplex	16	891	150	887	150	<b>887</b>	<b>150</b>	16	790	169	<b>783</b>	<b>170</b>	782	171
453.povray	16	302	282	303	281	<b>303</b>	<b>281</b>	16	270	315	269	316	<b>270</b>	<b>316</b>
454.calculix	16	447	296	<b>448</b>	<b>295</b>	449	294	16	<b>424</b>	<b>312</b>	425	311	423	312
459.GemsFDTD	16	1063	160	<b>1061</b>	<b>160</b>	1056	161	16	965	176	964	176	<b>965</b>	<b>176</b>
465.tonto	16	<b>602</b>	<b>261</b>	606	260	601	262	16	<b>549</b>	<b>287</b>	551	286	548	287
470.lbm	16	<b>734</b>	<b>300</b>	733	300	735	299	16	<b>734</b>	<b>300</b>	733	300	735	299
481.wrf	16	<b>687</b>	<b>260</b>	687	260	685	261	16	<b>642</b>	<b>279</b>	640	279	643	278
482.sphinx3	16	998	312	<b>994</b>	<b>314</b>	987	316	16	985	317	<b>980</b>	<b>318</b>	978	319

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=14336 in /etc/sysctl.conf  
 mount -t hugetlbfs nodev /mnt/hugepages



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## Platform Notes

BIOS Settings:  
Operating Mode set to Performance Mode

## General Notes

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

HUGETLB\_LIMIT = "896"

LD\_LIBRARY\_PATH = "/root/speccpu\_2011-03-22/speccpu\_rate\_revC-3/amd1002mc-rate-libs-revC/64:/root/speccpu\_2011-03-22/speccpu\_rate\_revC-3/amd1002mc-rate-libs-revC/32"

OMP\_NUM\_THREADS = "4"

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

Binaries were compiled on SLES10 SP2 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

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## Base Portability Flags (Continued)

481.wrf: -DSPEC\_CPU\_LP64 -DSPEC\_CPU\_LINUX -DSPEC\_CPU\_CASE\_FLAG  
-fno-second-underscore  
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:

openc

C++ benchmarks:

openCC

Fortran benchmarks:

openf95

Benchmarks using both Fortran and C:

openc 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

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## Peak Portability Flags (Continued)

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

## 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.dealIII: -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:

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## Peak Optimization Flags (Continued)

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

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.20101109.html>  
<http://www.spec.org/cpu2006/flags/amd-platform-rate-revC.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.20101109.xml>  
<http://www.spec.org/cpu2006/flags/amd-platform-rate-revC.xml>



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

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