



# SPEC® CFP2006 Result

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## Hewlett-Packard Company

### SPECfp®\_rate2006 = 331

ProLiant DL385 G7  
(2.5 GHz AMD Opteron 6180 SE)

### SPECfp\_rate\_base2006 = 305

CPU2006 license: 3

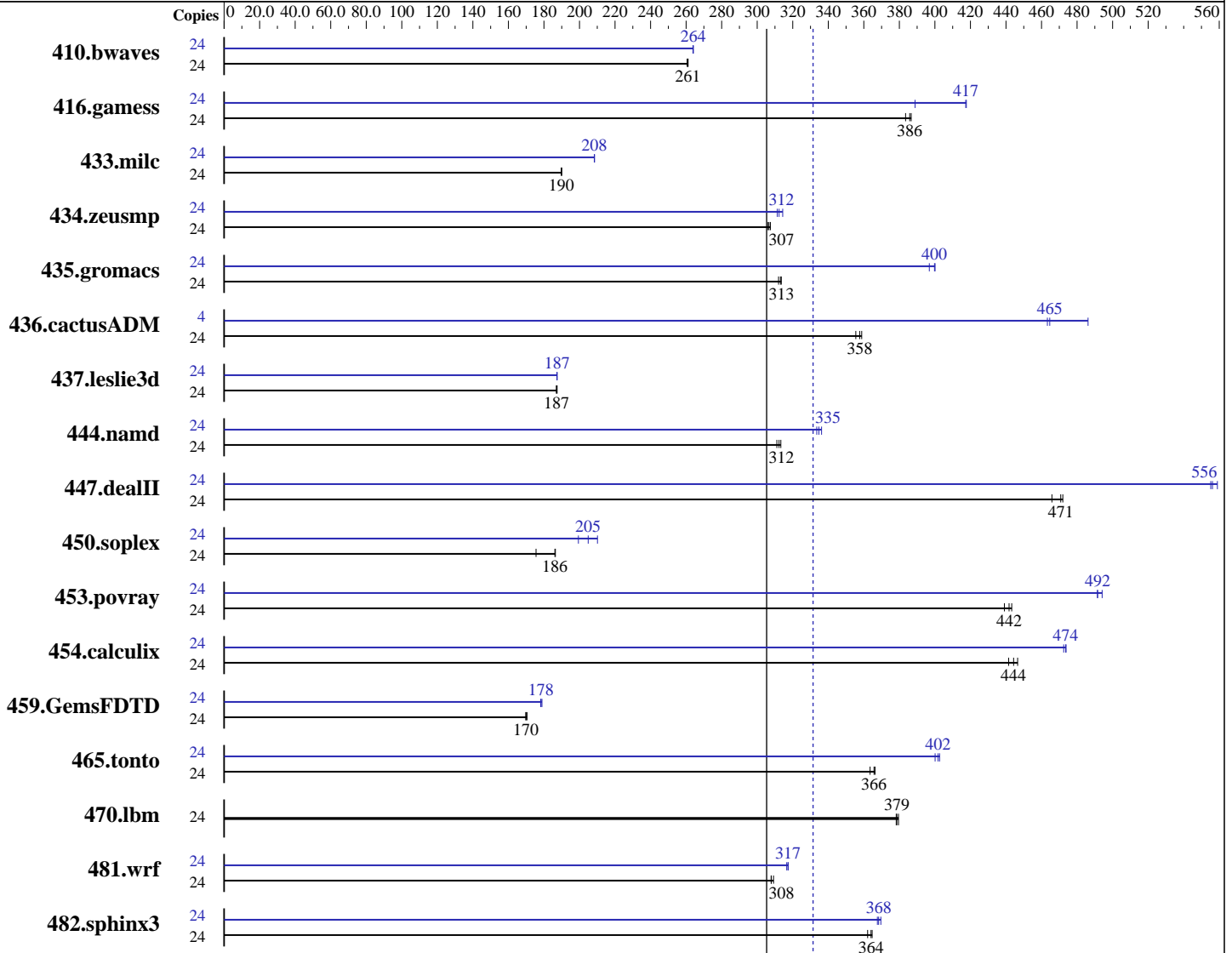
Test date: Jan-2011

Test sponsor: Hewlett-Packard Company

Hardware Availability: Feb-2011

Tested by: Hewlett-Packard Company

Software Availability: Aug-2010



SPECfp\_rate\_base2006 = 305

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### Hardware

CPU Name: AMD Opteron 6180 SE  
 CPU Characteristics:  
 CPU MHz: 2500  
 FPU: Integrated  
 CPU(s) enabled: 24 cores, 2 chips, 12 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

### Software

Operating System: SUSE Linux Enterprise Server 11 (x86\_64) SP1, 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 (multi-user)  
 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 / 6 cores  
Other Cache: None  
Memory: 64 GB (16 x 4 GB 2Rx4 PC3-10600R-9, ECC)  
Disk Subsystem: 1 x 146 GB 15 K SAS  
Other Hardware: None

## Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	24	1252	261	<u>1249</u>	<u>261</u>	1249	261	24	1236	264	<u>1236</u>	<u>264</u>	1235	264
416.gamess	24	1215	387	1225	384	<u>1218</u>	<u>386</u>	24	<u>1126</u>	<u>417</u>	1209	389	1125	418
433.milc	24	1161	190	<u>1160</u>	<u>190</u>	1160	190	24	<u>1057</u>	<u>208</u>	1057	208	1058	208
434.zeusmp	24	710	307	<u>712</u>	<u>307</u>	713	306	24	702	311	<u>699</u>	<u>312</u>	695	314
435.gromacs	24	549	312	547	314	<u>547</u>	<u>313</u>	24	<u>429</u>	<u>400</u>	428	400	432	397
436.cactusADM	24	<u>802</u>	<u>358</u>	807	355	799	359	4	<u>103</u>	<u>465</u>	103	463	98.3	486
437.leslie3d	24	1204	187	1207	187	<u>1206</u>	<u>187</u>	24	1205	187	1204	187	<u>1204</u>	<u>187</u>
444.namd	24	619	311	<u>616</u>	<u>312</u>	614	313	24	577	334	<u>575</u>	<u>335</u>	572	336
447.dealII	24	582	472	589	466	<u>583</u>	<u>471</u>	24	495	555	<u>494</u>	<u>556</u>	491	559
450.soplex	24	1140	176	<u>1075</u>	<u>186</u>	1074	186	24	1004	199	<u>977</u>	<u>205</u>	953	210
453.povray	24	291	439	<u>289</u>	<u>442</u>	288	443	24	<u>260</u>	<u>492</u>	258	494	260	491
454.calculix	24	443	447	<u>446</u>	<u>444</u>	448	442	24	419	472	418	474	<u>418</u>	<u>474</u>
459.GemsFDTD	24	1494	170	<u>1499</u>	<u>170</u>	1500	170	24	1424	179	1430	178	<u>1427</u>	<u>178</u>
465.tonto	24	645	366	<u>646</u>	<u>366</u>	650	364	24	587	403	<u>588</u>	<u>402</u>	590	400
470.lbm	24	869	380	<u>871</u>	<u>379</u>	872	378	24	869	380	<u>871</u>	<u>379</u>	872	378
481.wrf	24	867	309	<u>871</u>	<u>308</u>	871	308	24	<u>845</u>	<u>317</u>	845	317	847	317
482.sphinx3	24	1292	362	1283	365	<u>1285</u>	<u>364</u>	24	1272	368	1266	370	<u>1270</u>	<u>368</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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## Platform Notes

BIOS Configuration:  
HP Power Profile set to Maximum Performance  
Thermal Configuration set to Increased Cooling

## General Notes

Environment variables set by runspec before the start of the run:  
HUGETLB\_LIMIT = "450"  
LD\_LIBRARY\_PATH = "/cpu2006/amd1002mc-rate-libs-revC/64:/cpu2006/amd1002mc-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:  
openc

C++ benchmarks:  
openCC

Fortran benchmarks:  
openf95

Benchmarks using both Fortran and C:  
openc 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.lelie3d: -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:

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

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/hp-amd-linux-flags.20100330.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>

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

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