



SPEC[®] CFP2006 Result

Copyright 2006-2014 Standard Performance Evaluation Corporation

Dell Inc.

SPECfp[®]_rate2006 = 211

PowerEdge R515 (AMD Opteron 4376 HE, 2.60 GHz)

SPECfp_rate_base2006 = 188

CPU2006 license: 55

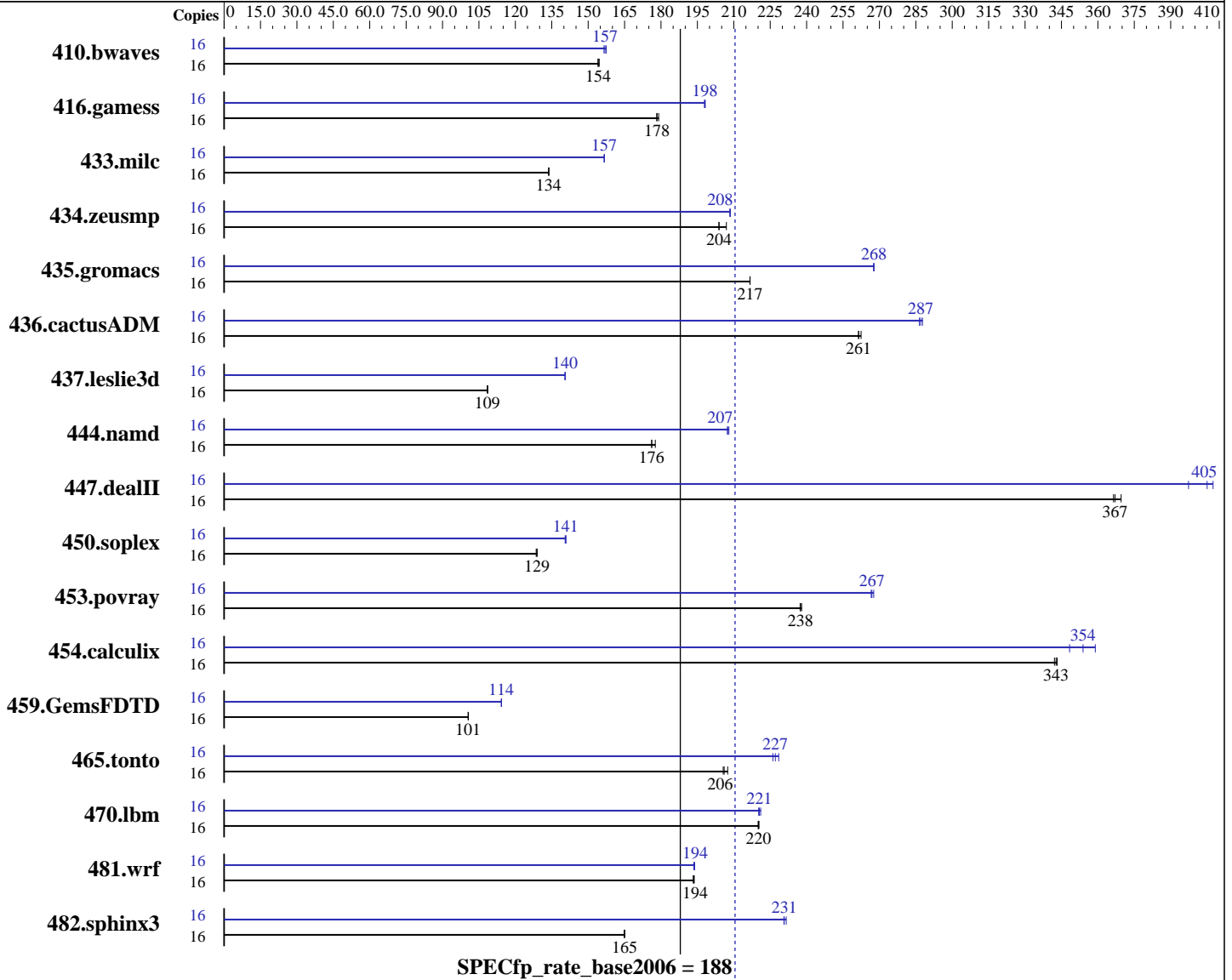
Test date: Oct-2012

Test sponsor: Dell Inc.

Hardware Availability: Nov-2012

Tested by: Dell Inc.

Software Availability: Aug-2012



Hardware

CPU Name: AMD Opteron 4376 HE
 CPU Characteristics: AMD Turbo CORE technology up to 3.60 GHz
 CPU MHz: 2600
 FPU: Integrated
 CPU(s) enabled: 16 cores, 2 chips, 8 cores/chip
 CPU(s) orderable: 1,2 chips

Continued on next page

Software

Operating System: Red Hat Enterprise Linux Server release 6.2, Kernel 2.6.32-220.el6.x86_64
 Compiler: C/C++/Fortran: Version 4.5.2 of x86 Open64 Compiler Suite (from AMD)
 Auto Parallel: No
 File System: ext3
 System State: Run level 3 (Full multiuser with network)
 Base Pointers: 64-bit
 Peak Pointers: 32/64-bit

Continued on next page



SPEC CFP2006 Result

Copyright 2006-2014 Standard Performance Evaluation Corporation

Dell Inc.

SPECfp_rate2006 = 211

PowerEdge R515 (AMD Opteron 4376 HE, 2.60 GHz)

SPECfp_rate_base2006 = 188

CPU2006 license: 55

Test date: Oct-2012

Test sponsor: Dell Inc.

Hardware Availability: Nov-2012

Tested by: Dell Inc.

Software Availability: Aug-2012

Primary Cache: 256 KB I on chip per chip,
64 KB I shared / 2 cores;
16 KB D on chip per core

Secondary Cache: 8 MB I+D on chip per chip, 2 MB shared / 2 cores

L3 Cache: 8 MB I+D on chip per chip

Other Cache: None

Memory: 32 GB (4 x 8 GB 2Rx4 PC3-12800R-11, ECC)

Disk Subsystem: 1 x 1 TB 7200 RPM SATA

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	16	<u>1410</u>	<u>154</u>	1407	155	1412	154	16	1389	157	1381	157	<u>1385</u>	<u>157</u>		
416.gamess	16	1750	179	<u>1756</u>	<u>178</u>	1758	178	16	1583	198	1580	198	<u>1582</u>	<u>198</u>		
433.milc	16	1098	134	1098	134	<u>1098</u>	<u>134</u>	16	938	157	938	157	<u>938</u>	<u>157</u>		
434.zeusmp	16	704	207	<u>714</u>	<u>204</u>	714	204	16	<u>699</u>	<u>208</u>	698	209	699	208		
435.gromacs	16	527	217	<u>527</u>	<u>217</u>	527	217	16	<u>427</u>	<u>268</u>	427	268	427	268		
436.cactusADM	16	729	262	<u>731</u>	<u>261</u>	732	261	16	664	288	667	286	<u>666</u>	<u>287</u>		
437.leslie3d	16	1387	108	1385	109	<u>1386</u>	<u>109</u>	16	1071	140	1070	141	<u>1070</u>	<u>140</u>		
444.namd	16	728	176	722	178	<u>728</u>	<u>176</u>	16	617	208	619	207	<u>619</u>	<u>207</u>		
447.dealII	16	500	366	<u>499</u>	<u>367</u>	495	370	16	<u>452</u>	<u>405</u>	461	397	449	407		
450.soplex	16	1035	129	1038	129	<u>1035</u>	<u>129</u>	16	950	141	947	141	<u>948</u>	<u>141</u>		
453.povray	16	358	238	359	237	<u>358</u>	<u>238</u>	16	<u>319</u>	<u>267</u>	319	267	318	268		
454.calculix	16	<u>385</u>	<u>343</u>	385	343	386	342	16	379	348	<u>373</u>	<u>354</u>	368	359		
459.GemsFDTD	16	<u>1688</u>	<u>101</u>	1688	101	1686	101	16	1486	114	<u>1486</u>	<u>114</u>	1486	114		
465.tonto	16	<u>764</u>	<u>206</u>	766	206	759	207	16	<u>693</u>	<u>227</u>	696	226	689	228		
470.lbm	16	<u>998</u>	<u>220</u>	999	220	998	220	16	994	221	<u>997</u>	<u>221</u>	998	220		
481.wrf	16	925	193	923	194	<u>924</u>	<u>194</u>	16	922	194	<u>922</u>	<u>194</u>	924	194		
482.sphinx3	16	1892	165	1889	165	<u>1890</u>	<u>165</u>	16	<u>1351</u>	<u>231</u>	1346	232	1352	231		

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

Transparent huge pages were enabled for this run (OS default)

Continued on next page



SPEC CFP2006 Result

Copyright 2006-2014 Standard Performance Evaluation Corporation

Dell Inc.

SPECfp_rate2006 = 211

PowerEdge R515 (AMD Opteron 4376 HE, 2.60 GHz)

SPECfp_rate_base2006 = 188

CPU2006 license: 55

Test date: Oct-2012

Test sponsor: Dell Inc.

Hardware Availability: Nov-2012

Tested by: Dell Inc.

Software Availability: Aug-2012

Operating System Notes (Continued)

Huge pages were not configured for this run.

General Notes

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

LD_LIBRARY_PATH = "/root/cpu2006-1.2/amd1206-rate-libs-revA/32:/root/cpu2006-1.2/amd1206-rate-libs-revA/64"

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

Binaries were compiled on a system with 2x AMD Opteron 6386SE chips + 128GB Memory using RHEL 6.3

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.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_LINUX -DSPEC_CPU_CASE_FLAG -DSPEC_CPU_LP64
 -fno-second-underscore

Continued on next page



SPEC CFP2006 Result

Copyright 2006-2014 Standard Performance Evaluation Corporation

Dell Inc.

SPECfp_rate2006 = 211

PowerEdge R515 (AMD Opteron 4376 HE, 2.60 GHz)

SPECfp_rate_base2006 = 188

CPU2006 license: 55

Test date: Oct-2012

Test sponsor: Dell Inc.

Hardware Availability: Nov-2012

Tested by: Dell Inc.

Software Availability: Aug-2012

Base Portability Flags (Continued)

482.sphinx3: -DSPEC_CPU_LP64

Base Optimization Flags

C benchmarks:

-Ofast -OPT:malloc_alg=1 -HP:bd=2m:heap=2m -IPA:plimit=8000
-IPA:small_pu=100 -mso -march=bdver1

C++ benchmarks:

-Ofast -static -CG:load_exe=0 -OPT:malloc_alg=1 -INLINE:aggressive=on
-HP:bd=2m:heap=2m -D__OPEN64_FAST_SET -march=bdver1

Fortran benchmarks:

-Ofast -LNO:blocking=off -LNO:simd_peel_align=on -OPT:rsqrt=2
-OPT:unroll_size=256 -HP:bd=2m:heap=2m -mso -march=bdver1

Benchmarks using both Fortran and C:

-Ofast -OPT:malloc_alg=1 -HP:bd=2m:heap=2m -IPA:plimit=8000
-IPA:small_pu=100 -mso -march=bdver1 -LNO:blocking=off
-LNO:simd_peel_align=on -OPT:rsqrt=2 -OPT:unroll_size=256

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

Continued on next page



SPEC CFP2006 Result

Copyright 2006-2014 Standard Performance Evaluation Corporation

Dell Inc.

SPECfp_rate2006 = 211

PowerEdge R515 (AMD Opteron 4376 HE, 2.60 GHz)

SPECfp_rate_base2006 = 188

CPU2006 license: 55

Test date: Oct-2012

Test sponsor: Dell Inc.

Hardware Availability: Nov-2012

Tested by: Dell Inc.

Software Availability: Aug-2012

Peak Portability Flags (Continued)

```

437.leslie3d: -DSPEC_CPU_LP64
444.namd: -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_LINUX -DSPEC_CPU_CASE_FLAG -DSPEC_CPU_LP64
-fno-second-underscore

```

Peak Optimization Flags

C benchmarks:

```

433.milc: -Ofast -CG:movnti=1 -CG:locs_best=on -HP:bdt=2m:heap=2m
-IPA:plimit=7000 -IPA:callee_limit=1200
-OPT:struct_array_copy=2 -OPT:alias=field_sensitive -mso
-march=bdver1

470.lbm: -Ofast -CG:cmp_peep=on -OPT:keep_ext=on -HP:bdt=2m:heap=2m
-IPA:plimit=8000 -IPA:small_pu=100 -march=bdver1 -mso

482.sphinx3: -fb_create fbdata(pass 1) -fb_opt fbdata(pass 2) -Ofast
-m32 -IPA:plimit=1000 -OPT:malloc_alg=2 -CG:cmp_peep=on
-CG:p2align=0 -CG:load_exe=1 -CG:dsched=on
-INLINE:aggressive=on -LNO:prefetch=2 -LNO:prefetch_ahead=4
-mso -march=bdver2

```

C++ benchmarks:

```

444.namd: -Ofast -IPA:plimit=3000 -LNO:ignore_feedback=off
-CG:local_sched_alg=0 -CG:load_exe=0 -OPT:unroll_size=256
-fno-exceptions -HP:bdt=2m:heap=2m -LNO:if_select_conv=1
-OPT:alias=disjoint -LNO:psimd_iso_unroll=ON -march=bdver1

447.dealIII: -Ofast -D__OPEN64_FAST_SET -static -INLINE:aggressive=on
-LNO:opt=1 -LNO:simd=2 -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 -CG:movext_icmp=off -TENV:frame_pointer=off
-march=bdver1

450.soplex: -fb_create fbdata(pass 1) -fb_opt fbdata(pass 2) -O3
-LNO:ignore_feedback=off -INLINE:aggressive=on -OPT:RO=1
-OPT:IEEE_arith=3 -OPT:IEEE_NaN_Inf=off
-OPT:fold_unsigned_relops=on -fno-exceptions -CG:p2align=0
-m32 -mno-fma4 -HP:bdt=2m:heap=2m -WOPT:sib=on
-march=bdver1

```

Continued on next page



SPEC CFP2006 Result

Copyright 2006-2014 Standard Performance Evaluation Corporation

Dell Inc.

SPECfp_rate2006 = 211

PowerEdge R515 (AMD Opteron 4376 HE, 2.60 GHz)

SPECfp_rate_base2006 = 188

CPU2006 license: 55

Test date: Oct-2012

Test sponsor: Dell Inc.

Hardware Availability: Nov-2012

Tested by: Dell Inc.

Software Availability: Aug-2012

Peak Optimization Flags (Continued)

```
453.povray: -fb_create fbdata(pass 1) -fb_opt fbdata(pass 2) -Ofast
-CG:pre_local_sched=off -CG:p2align=0 -CG:p2align_split=on
-CG:dsched=on -INLINE:aggressive=on -HP:bd=2m:heap=2m
-OPT:transform=2 -OPT:alias=disjoint -WOPT:aggcm=0
-march=bdver2
```

Fortran benchmarks:

```
410.bwaves: -fb_create fbdata(pass 1) -fb_opt fbdata(pass 2) -Ofast
-OPT:Ofast -OPT:treeheight=on -LNO:blocking=off
-LNO:ignore_feedback=off -LNO:fu=4 -LNO:loop_model_simd=on
-LNO:simd_rm_unity_remainder=on -WOPT:aggstr=0
-HP:bd=2m:heap=2m -CG:cmp_peep=on -march=bdver1
```

```
416.gamess: -fb_create fbdata(pass 1) -fb_opt fbdata(pass 2) -Ofast
-LNO:fu=6 -LNO:blocking=0 -LNO:simd=2 -OPT:ro=3
-OPT:recip=on -CG:local_sched_alg=1 -HP:bd=2m:heap=2m
-WOPT:sib=on -march=bdver1
```

```
434.zeusmp: -fb_create fbdata(pass 1) -fb_opt fbdata(pass 2) -Ofast
-LNO:blocking=off -LNO:interchange=off -IPA:plimit=1500
-HP:bd=2m:heap=2m -march=bdver1
```

```
437.leslie3d: -Ofast -CG:pre_minreg_level=2 -LNO:simd=0 -LNO:fusion=2
-HP:bd=2m:heap=2m -mso -march=bdver1
```

```
459.GemsFDTD: -Ofast -IPA:plimit=1500 -OPT:unroll_size=1024
-OPT:unroll_times_max=16 -LNO:fission=2
-CG:local_sched_alg=2 -HP -march=bdver1
```

```
465.tonto: -Ofast -OPT:alias=no_f90_pointer_alias -LNO:blocking=off
-CG:load_exe=1 -CG:local_sched_alg=3 -IPA:plimit=525
-HP:bd=2m:heap=2m -march=bdver1
```

Benchmarks using both Fortran and C:

```
435.gromacs: -Ofast -OPT:rsqrt=2 -HP:bd=2m:heap=2m
-CG:local_sched_alg=2 -CG:load_exe=3 -GRA:unspill=on
-march=bdver1 -LNO:simd=3
```

```
436.cactusADM: -fb_create fbdata(pass 1) -fb_opt fbdata(pass 2) -Ofast
-LNO:blocking=off -LNO:prefetch=2 -LNO:pf2=0
-LNO:prefetch_ahead=4 -HP -CG:locs_shallow_depth=1
-CG:load_exe=0 -CG:dsched=on -WOPT:sib=on -march=bdver1
```

```
454.calculix: -Ofast -OPT:unroll_size=256 -OPT:alias=disjoint
-GRA:optimize_boundary=on -CG:dsched=on -HP:bd=2m:heap=2m
-march=bdver1
```

Continued on next page



SPEC CFP2006 Result

Copyright 2006-2014 Standard Performance Evaluation Corporation

Dell Inc.

SPECfp_rate2006 = 211

PowerEdge R515 (AMD Opteron 4376 HE, 2.60 GHz)

SPECfp_rate_base2006 = 188

CPU2006 license: 55

Test date: Oct-2012

Test sponsor: Dell Inc.

Hardware Availability: Nov-2012

Tested by: Dell Inc.

Software Availability: Aug-2012

Peak Optimization Flags (Continued)

```
481.wrf: -Ofast -LNO:blocking=off -LANG:copyinout=off
        -IPA:callee_limit=5000 -GRA:prioritize_by_density=on -HP
        -WOPT:sib=on -march=bdver1
```

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

<http://www.spec.org/cpu2006/flags/x86-open64-452-flags-rate-revA-II.html>

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

<http://www.spec.org/cpu2006/flags/x86-open64-452-flags-rate-revA-II.xml>

SPEC and SPECfp are registered trademarks of the Standard Performance Evaluation Corporation. All other brand and product names appearing in this result are trademarks or registered trademarks of their respective holders.

For questions about this result, please contact the tester.
For other inquiries, please contact webmaster@spec.org.

Tested with SPEC CPU2006 v1.2.
Report generated on Thu Jul 24 14:34:11 2014 by SPEC CPU2006 PS/PDF formatter v6932.
Originally published on 2 January 2013.