



# SPEC<sup>®</sup> CFP2006 Result

Copyright 2006-2014 Standard Performance Evaluation Corporation

Dell Inc.

SPECfp<sup>®</sup>\_rate2006 = 840

PowerEdge R815 (AMD Opteron 6380, 2.50 GHz)

SPECfp\_rate\_base2006 = 753

CPU2006 license: 55

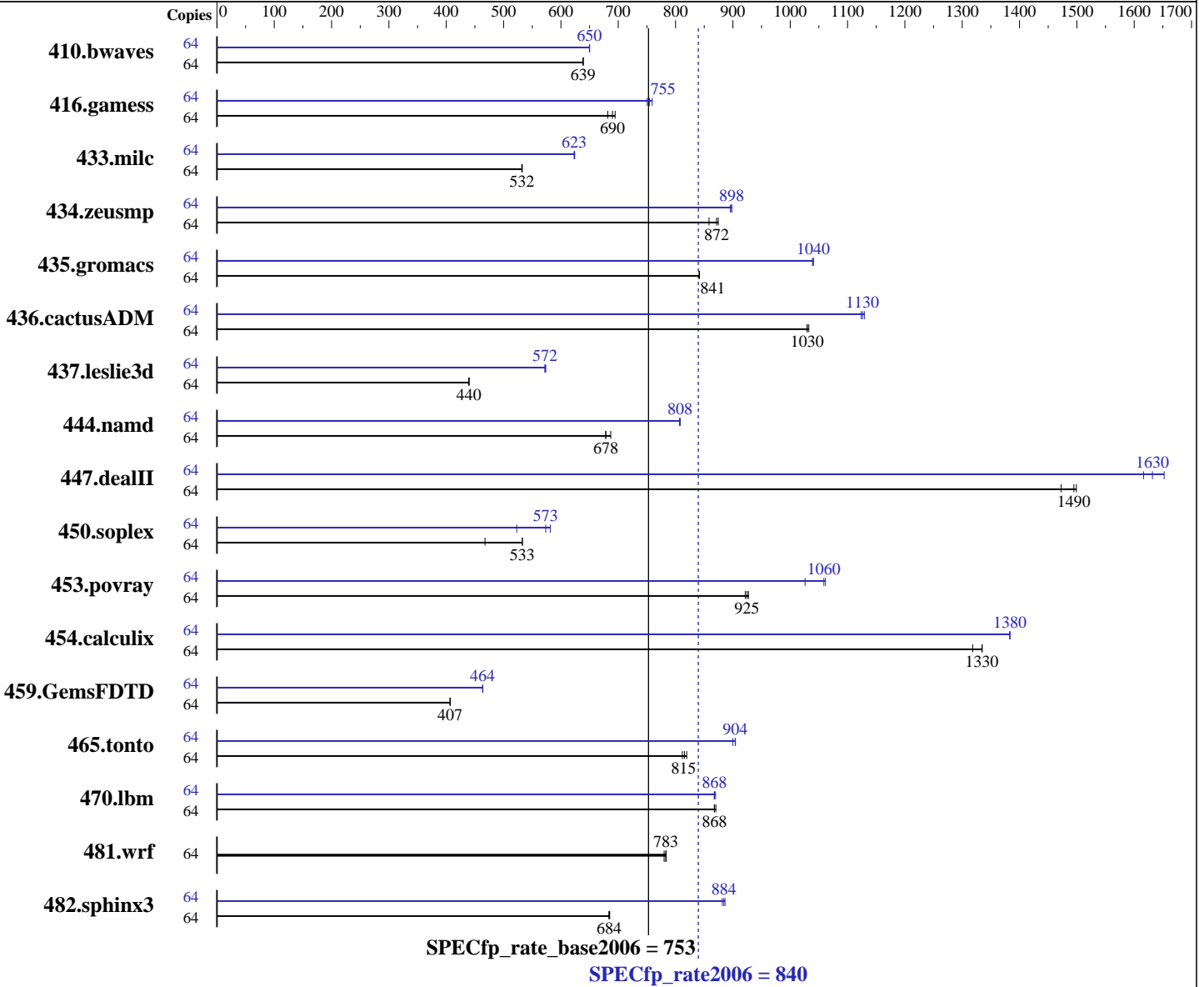
Test date: Nov-2012

Test sponsor: Dell Inc.

Hardware Availability: Nov-2012

Tested by: Dell Inc.

Software Availability: Aug-2012



### Hardware

CPU Name: AMD Opteron 6380  
 CPU Characteristics: AMD Turbo CORE technology up to 3.40 GHz  
 CPU MHz: 2500  
 FPU: Integrated  
 CPU(s) enabled: 64 cores, 4 chips, 16 cores/chip  
 CPU(s) orderable: 2,4 chips

Continued on next page

### Software

Operating System: Red Hat Enterprise Linux Server release 6.3, Kernel 2.6.32-279.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 = 840

PowerEdge R815 (AMD Opteron 6380, 2.50 GHz)

SPECfp\_rate\_base2006 = 753

CPU2006 license: 55

Test date: Nov-2012

Test sponsor: Dell Inc.

Hardware Availability: Nov-2012

Tested by: Dell Inc.

Software Availability: Aug-2012

Primary Cache: 512 KB I on chip per chip,  
64 KB I shared / 2 cores;  
16 KB D on chip per core

Secondary Cache: 16 MB I+D on chip per chip, 2 MB shared / 2 cores

L3 Cache: 16 MB I+D on chip per chip, 8 MB shared / 8 cores

Other Cache: None

Memory: 256 GB (32 x 8 GB 2Rx4 PC3-12800R-11, ECC)

Disk Subsystem: 2 x 146 GB 6Gb 15000 RPM SAS, RAID 0

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	64	1362	639	<u>1362</u>	<u>639</u>	1361	639	64	1338	650	<u>1338</u>	<u>650</u>	1339	650		
416.gamess	64	1804	695	<u>1816</u>	<u>690</u>	1838	682	64	1670	751	1650	759	<u>1661</u>	<u>755</u>		
433.milc	64	1103	533	1105	532	<u>1104</u>	<u>532</u>	64	941	624	943	623	<u>943</u>	<u>623</u>		
434.zeusmp	64	<u>668</u>	<u>872</u>	678	858	666	874	64	650	895	649	898	<u>649</u>	<u>898</u>		
435.gromacs	64	<u>543</u>	<u>841</u>	543	842	543	841	64	<u>439</u>	<u>1040</u>	439	1040	440	1040		
436.cactusADM	64	<u>743</u>	<u>1030</u>	741	1030	743	1030	64	681	1120	<u>679</u>	<u>1130</u>	677	1130		
437.leslie3d	64	1368	440	1370	439	<u>1368</u>	<u>440</u>	64	1052	572	<u>1051</u>	<u>572</u>	1049	574		
444.namd	64	757	678	<u>757</u>	<u>678</u>	747	687	64	<u>635</u>	<u>808</u>	636	807	635	808		
447.dealII	64	497	1470	488	1500	<u>490</u>	<u>1490</u>	64	453	1620	<u>449</u>	<u>1630</u>	443	1650		
450.soplex	64	1141	468	<u>1002</u>	<u>533</u>	1002	533	64	1021	523	<u>931</u>	<u>573</u>	918	581		
453.povray	64	<u>368</u>	<u>925</u>	367	927	369	922	64	332	1030	<u>322</u>	<u>1060</u>	321	1060		
454.calculix	64	396	1330	<u>396</u>	<u>1330</u>	400	1320	64	382	1380	<u>382</u>	<u>1380</u>	382	1380		
459.GemsFDTD	64	1670	407	1668	407	<u>1669</u>	<u>407</u>	64	<u>1465</u>	<u>464</u>	1465	463	1464	464		
465.tonto	64	769	819	<u>772</u>	<u>815</u>	776	812	64	700	900	<u>697</u>	<u>904</u>	696	904		
470.lbm	64	1010	870	<u>1013</u>	<u>868</u>	1014	868	64	1011	870	1014	868	<u>1013</u>	<u>868</u>		
481.wrf	64	912	784	916	780	<u>913</u>	<u>783</u>	64	912	784	916	780	<u>913</u>	<u>783</u>		
482.sphinx3	64	1825	684	<u>1822</u>	<u>684</u>	1821	685	64	<u>1411</u>	<u>884</u>	1415	881	1407	886		

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 transparent\_hugepage=never as a boot parameter in /boot/grub/menu.lst  
Continued on next page



# SPEC CFP2006 Result

Copyright 2006-2014 Standard Performance Evaluation Corporation

Dell Inc.

SPECfp\_rate2006 = 840

PowerEdge R815 (AMD Opteron 6380, 2.50 GHz)

SPECfp\_rate\_base2006 = 753

CPU2006 license: 55

Test date: Nov-2012

Test sponsor: Dell Inc.

Hardware Availability: Nov-2012

Tested by: Dell Inc.

Software Availability: Aug-2012

## Operating System Notes (Continued)

```
Set vm/nr_hugepages=57344 in /etc/sysctl.conf
mount -t hugetlbfs nodev /mnt/hugepages
```

## General Notes

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

HUGETLB\_LIMIT = "896"

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:

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

```

Continued on next page



# SPEC CFP2006 Result

Copyright 2006-2014 Standard Performance Evaluation Corporation

Dell Inc.

SPECfp\_rate2006 = 840

PowerEdge R815 (AMD Opteron 6380, 2.50 GHz)

SPECfp\_rate\_base2006 = 753

CPU2006 license: 55

Test date: Nov-2012

Test sponsor: Dell Inc.

Hardware Availability: Nov-2012

Tested by: Dell Inc.

Software Availability: Aug-2012

## Base Portability Flags (Continued)

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

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

Continued on next page



# SPEC CFP2006 Result

Copyright 2006-2014 Standard Performance Evaluation Corporation

Dell Inc.

SPECfp\_rate2006 = 840

PowerEdge R815 (AMD Opteron 6380, 2.50 GHz)

SPECfp\_rate\_base2006 = 753

CPU2006 license: 55

Test date: Nov-2012

Test sponsor: Dell Inc.

Hardware Availability: Nov-2012

Tested by: Dell Inc.

Software Availability: Aug-2012

## Peak Portability Flags (Continued)

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  
 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

Continued on next page



# SPEC CFP2006 Result

Copyright 2006-2014 Standard Performance Evaluation Corporation

Dell Inc.

SPECfp\_rate2006 = 840

PowerEdge R815 (AMD Opteron 6380, 2.50 GHz)

SPECfp\_rate\_base2006 = 753

CPU2006 license: 55

Test date: Nov-2012

Test sponsor: Dell Inc.

Hardware Availability: Nov-2012

Tested by: Dell Inc.

Software Availability: Aug-2012

## Peak Optimization Flags (Continued)

450.soplex (continued):

-march=bdver1

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 = 840

PowerEdge R815 (AMD Opteron 6380, 2.50 GHz)

SPECfp\_rate\_base2006 = 753

CPU2006 license: 55

Test date: Nov-2012

Test sponsor: Dell Inc.

Hardware Availability: Nov-2012

Tested by: Dell Inc.

Software Availability: Aug-2012

## Peak Optimization Flags (Continued)

481.wrf:basepeak = yes

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](mailto:webmaster@spec.org).

Tested with SPEC CPU2006 v1.2.  
Report generated on Thu Jul 24 14:30:44 2014 by SPEC CPU2006 PS/PDF formatter v6932.  
Originally published on 2 January 2013.