Dell Inc.

PowerEdge R415 (AMD Opteron 4332 HE, 3.00 GHz)

**SPEC**_fp_rate2006 = 194

**SPECfp_rate_base2006 = 174**

**CPU2006 license:** 55

**Test sponsor:** Dell Inc.

**Test date:** Oct-2012

**Tested by:** Dell Inc.

**Hardware Availability:** Nov-2012

**Software Availability:** Aug-2012

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**Hardware**

- **CPU Name:** AMD Opteron 4332 HE
- **CPU Characteristics:**
  - AMD Turbo CORE technology up to 3.70 GHz
  - 12 cores, 2 chips, 6 cores/chip
  - 1,2 chips

**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

---

**SPECfp_rate2006 = 194**

**SPECfp_rate_base2006 = 174**
SPEC CFP2006 Result

Dell Inc.
PowerEdge R415 (AMD Opteron 4332 HE, 3.00 GHz)

SPECfp_rate2006 = 194
SPECfp_rate_base2006 = 174

CPU2006 license: 55
Test sponsor: Dell Inc.
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Test date: Oct-2012
Hardware Availability: Nov-2012
Software Availability: Aug-2012

Primary Cache: 192 KB I on chip per chip,
64 KB I shared / 2 cores;
16 KB D on chip per core
Secondary Cache: 6 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

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</table>

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
Dell Inc. 

PowerEdge R415 (AMD Opteron 4332 HE, 3.00 GHz) 

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Operating System Notes (Continued)

Set vm/nr_hugepages=5760 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 = "480"
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

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SPEC CFP2006 Result

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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: 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

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SPEC CFP2006 Result

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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

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
-IPA:local_sched_alg=0 -CG:load_exe=0 -OPT:unroll_size=256
-fno-exceptions -HP:bdt=2m:heap=2m -LNO:if_select_conv=1
-IPA:plimit=7000 -IPA:callee_limit=1200
-IPA:callee_limit=1200

447. dealII: -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
-HP:bdt=2m:heap=2m -LNO:if_select_conv=1
-IPA:plimit=7000 -IPA:callee_limit=1200

450. soplex: -fb_create fbdata(pass 1) -fb_opt fbdata(pass 2) -O3
-LNO:ignore_feedback=off -INLINE:aggressive=on -OPT:RO=1
-IPA:local_sched_alg=0 -CG:load_exe=0 -OPT:unroll_size=256
-IPA:local_sched_alg=0 -CG:load_exe=0 -OPT:unroll_size=256
-IPA:local_sched_alg=0 -CG:load_exe=0 -OPT:unroll_size=256

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Dell Inc.  
PowerEdge R415 (AMD Opteron 4332 HE, 3.00 GHz)  

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</tr>
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</table>

## Peak Optimization Flags (Continued)

450. soplex (continued):
- march=bdver1

453. povray:
- -fb_create fbd data(pass 1) -fb_opt fbd data(pass 2) -Ofast
- -CG: pre_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: aggcmin=0
- -march=bdver2

Fortran benchmarks:

410. bwaves:
- -fb_create fbd data(pass 1) -fb_opt fbd data(pass 2) -Ofast
- -OPT: Ofast -OPT: treeheight=off -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. games:
- -fb_create fbd data(pass 1) -fb_opt fbd data(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 fbd data(pass 1) -fb_opt fbd data(pass 2) -Ofast
- -LNO: blocking=off -LNO: interchange=off -IPA: plimit=1500
- -HP: bd=2m: heap=2m -msl=2m -march=bdver1

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

459. GemsFDTD:
- -OPT: 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 fbd data(pass 1) -fb_opt fbd data(pass 2) -Ofast
- -LNO: blocking=off -LNO: prefetch=2 -LNO: pf2=0
- -LNO: prefetch=off -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

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## Dell Inc.

### PowerEdge R415 (AMD Opteron 4332 HE, 3.00 GHz)

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Test date: Oct-2012  
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### Peak Optimization Flags (Continued)

```plaintext
```

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](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:


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For other inquiries, please contact webmaster@spec.org.

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