## SPEC® CFP2006 Result

**Dell Inc.**

**PowerEdge R715 (AMD Opteron 6164 HE, 1.70 GHz)**

### SPECfps

<table>
<thead>
<tr>
<th>SPECfps rate2006</th>
<th>SPECfps rate_base2006</th>
</tr>
</thead>
<tbody>
<tr>
<td>269</td>
<td>247</td>
</tr>
</tbody>
</table>

### CPU2006 license: 55

**Test sponsor:** Dell Inc.

**Tested by:** Dell Inc.

**Test date:** Jun-2010

**Hardware Availability:** May-2010

**Software Availability:** Feb-2010

### Hardware

- **CPU Name:** AMD Opteron 6164 HE
- **CPU Characteristics:**
  - CPU MHz: 1700
  - FPU: Integrated
  - CPU(s) enabled: 24 cores, 2 chips, 12 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 (x86_64), Kernel 2.6.27.19-5-smp
- **Compiler:** x86 Open64 4.2.3 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

### SPECfps Results

<table>
<thead>
<tr>
<th>Code</th>
<th>Benchmark</th>
<th>Copies</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>410</td>
<td>bwaves</td>
<td>24</td>
<td>286</td>
</tr>
<tr>
<td>416</td>
<td>gamess</td>
<td>24</td>
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<td>433</td>
<td>zeusmp</td>
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<td>434</td>
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<td>437</td>
<td>leslie3d</td>
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<td>444</td>
<td>namd</td>
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<td>447</td>
<td>dealII</td>
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<td>450</td>
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<td>459</td>
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<td>481</td>
<td>wrf</td>
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<td>482</td>
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</table>

**Continued on next page**
Dell Inc.

PowerEdge R715 (AMD Opteron 6164 HE, 1.70 GHz)

SPECfpu_rate2006 = 269
SPECfpu_rate_base2006 = 247

CPU2006 license: 55
Test sponsor: Dell Inc.
Tested by: Dell Inc.

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 DDR3-1333 DR RDIMM, CL9, ECC)
Disk Subsystem: 1 x 148 GB 10000 RPM SAS
Other Hardware: None

Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Copies</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
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<td>317</td>
<td>1461</td>
<td>320</td>
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<td>318</td>
</tr>
</tbody>
</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 vm/nr_hugepages=10800 in /etc/sysctl.conf
mount -t hugetlbfs nodev /mnt/hugepages
SPEC CFP2006 Result

Dell Inc.
PowerEdge R715 (AMD Opteron 6164 HE, 1.70 GHz)

| SPECfp_rate2006 = | 269 |
| SPECfp_rate_base2006 = | 247 |

CPU2006 license: 55
Test sponsor: Dell Inc.
Tested by: Dell Inc.

Test date: Jun-2010
Hardware Availability: May-2010
Software Availability: Feb-2010

General Notes

Environment variables set by runspec before the start of the run:
HUGETLB_LIMIT = "450"
LD_LIBRARY_PATH = "/cpu2006/amd1002mc-rate-revA-libs/64:/cpu2006/amd1002mc-rate-revA-libs/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

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
481.wrf: -DSPEC_CPU_LP64 -DSPEC_CPU_LINUX -DSPEC_CPU_CASE_FLAG -fno-second-underscore
482.sphinx3: -DSPEC_CPU_LP64
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Base Optimization Flags

C benchmarks:
  -march=barcelona -msl -Ofast -OPT:malloc_alg=1 -HP:bdt=2m

C++ benchmarks:
  -march=barcelona -msl -Ofast -static -INLINE:aggressive=on
  -OPT:malloc_alg=1 -HP:bdt=2m

Fortran benchmarks:
  -march=barcelona -msl -Ofast -HP

Benchmarks using both Fortran and C:
  -march=barcelona -msl -Ofast -OPT:malloc_alg=1 -HP:bdt=2m -HP

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
343.milc: -DSPEC_CPU_LP64
434.zeusmp: -DSPEC_CPU_LP64
435.gromacs: -DSPEC_CPU_LP64
436.cactusADM: -DSPEC_CPU_LP64 -fno-second-underscore
347.leslie3d: -DSPEC_CPU_LP64
444.namd: -DSPEC_CPU_LP64
455.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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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_al=2
- CG:ssse_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
- 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

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Peak Optimization Flags (Continued)

437.leslie3d: -march=barcelona -ms -Ofast -HP:bdt=2m:heap=2m

459.GemsFDTD: -march=barcelona -ms -Ofast -LNO:fission=2
- -LNO:prefetchAhead=1 -CG:load_exe=0 -CG:local_sched_alg=1

465.tonto: -march=barcelona -ms -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 -ms -Ofast -OPT:rsqrt=2
- -HP:bdt=2m:heap=2m

436.cactusADM: -march=barcelona -ms -fb_create fbdata(pass 1)
- -fb_opt fbdata(pass 2) -Ofast -apo -LNO:prefetchAhead=1
- -HP:bdt=2m:heap=2m -LANG:heap_allocation_threshold=100

454.calculix: -march=barcelona -ms -Ofast -CG:load_exe=0
- -CG:ptr_load_use=0 -CG:local_sched_alg=2 -CG:compute_to=on
- -LNO:prefetchAhead=30 -WOPT:unroll=2
- -GRA:optimize_boundary=on -HP:bdt=2m:heap=2m

481.wrf: -march=barcelona -ms -Ofast -LNO:blocking=off
- -LNO:prefetchAhead=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-open64-4.2.3-flags-revA.20100721.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2006/flags/x86-open64-4.2.3-flags-revA.20100721.xml
http://www.spec.org/cpu2006/flags/amd-platform-revA.xml

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

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