



SPEC® CFP2006 Result

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Dell Inc.

SPECfp®2006 = 49.8

PowerEdge R910 (Intel Xeon X7550, 2.00 GHz)

SPECfp_base2006 = 45.1

CPU2006 license: 55

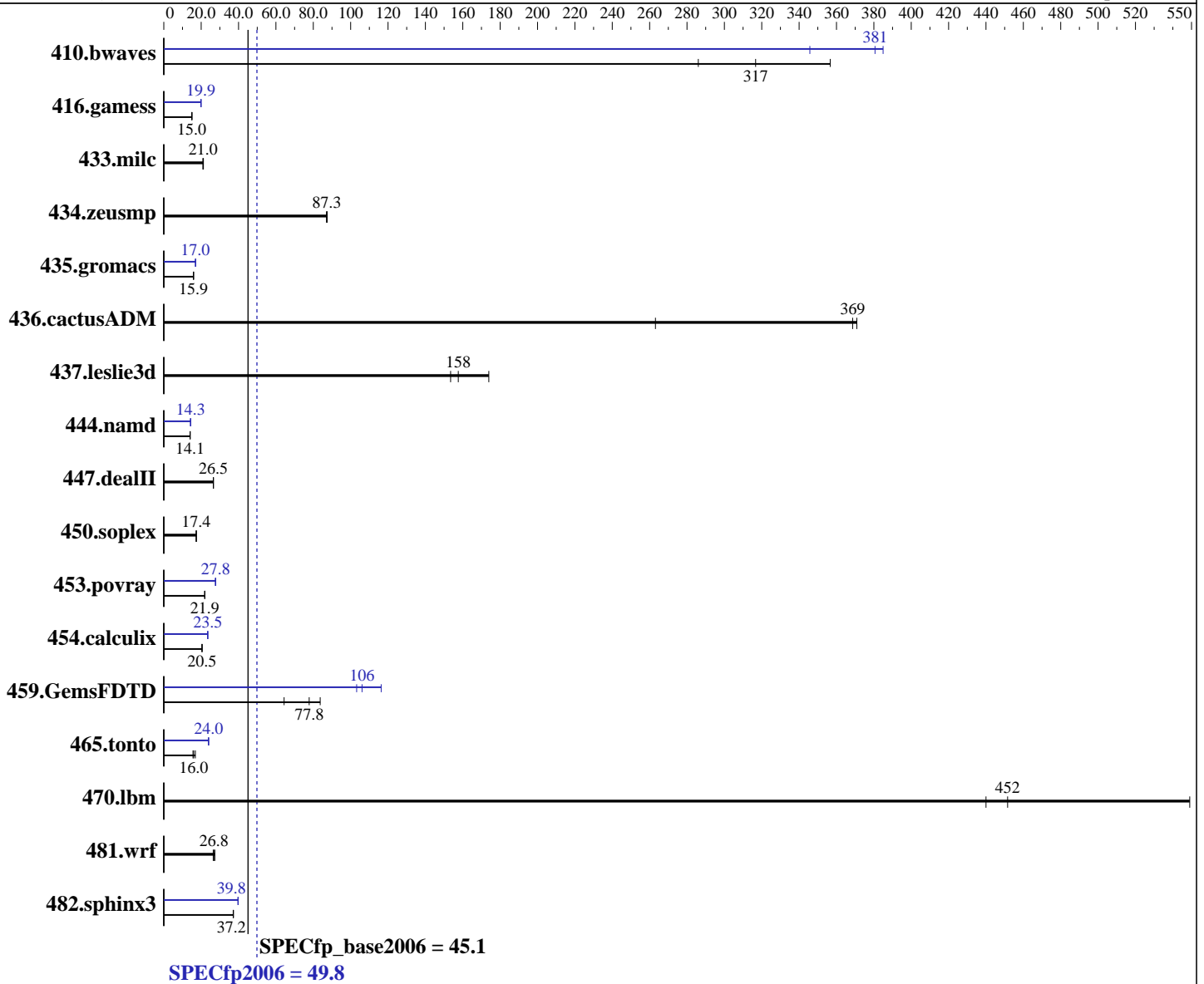
Test date: Apr-2011

Test sponsor: Dell Inc.

Hardware Availability: Jul-2011

Tested by: Dell Inc.

Software Availability: Apr-2011



Hardware

CPU Name: Intel Xeon X7550
 CPU Characteristics: Intel Turbo Boost Technology up to 2.40 GHz
 CPU MHz: 2000
 FPU: Integrated
 CPU(s) enabled: 32 cores, 4 chips, 8 cores/chip, 2 threads/core
 CPU(s) orderable: 2,4 chips
 Primary Cache: 32 KB I + 32 KB D on chip per core
 Secondary Cache: 256 KB I+D on chip per core

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Software

Operating System: SUSE Linux Enterprise Server 11 SP1 (x86_64), Kernel 2.6.32.12-0.7-default
 Compiler: Intel C++ and Fortran Intel 64 Compiler XE for applications running on Intel 64 Version 12.0 Update 3
 Auto Parallel: Yes
 File System: ext3
 System State: Run level 3 (multi-user)
 Base Pointers: 64-bit

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L3 Cache: 18 MB I+D on chip per chip
Other Cache: None
Memory: 512 GB (64 x 8 GB 4Rx8 PC3-8500R-7, ECC)
Disk Subsystem: 1 x 500 GB 7200 RPM SAS 6Gb
Other Hardware: None

Peak Pointers: 32/64-bit
Other Software: None

Results Table

| Benchmark | Base | | | | | | Peak | | | | | |
|---------------|-------------|-------------|------------|-------------|-------------|-------------|-------------|-------------|------------|-------------|-------------|-------------|
| | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio |
| 410.bwaves | <u>42.9</u> | <u>317</u> | 47.5 | 286 | 38.1 | 357 | <u>35.7</u> | <u>381</u> | 35.3 | 385 | 39.3 | 346 |
| 416.gamess | <u>1303</u> | <u>15.0</u> | 1307 | 15.0 | 1299 | 15.1 | 981 | 20.0 | <u>984</u> | <u>19.9</u> | 986 | 19.9 |
| 433.milc | <u>437</u> | <u>21.0</u> | 433 | 21.2 | 438 | 21.0 | <u>437</u> | <u>21.0</u> | 433 | 21.2 | 438 | 21.0 |
| 434.zeusmp | 104 | 87.4 | 104 | 87.1 | <u>104</u> | <u>87.3</u> | 104 | 87.4 | 104 | 87.1 | <u>104</u> | <u>87.3</u> |
| 435.gromacs | 447 | 16.0 | 450 | 15.9 | <u>450</u> | <u>15.9</u> | 420 | 17.0 | 421 | 17.0 | <u>421</u> | <u>17.0</u> |
| 436.cactusADM | <u>32.4</u> | <u>369</u> | 45.4 | 263 | 32.2 | 371 | <u>32.4</u> | <u>369</u> | 45.4 | 263 | 32.2 | 371 |
| 437.leslie3d | 61.2 | 153 | 54.0 | 174 | <u>59.6</u> | <u>158</u> | 61.2 | 153 | 54.0 | 174 | <u>59.6</u> | <u>158</u> |
| 444.namd | <u>570</u> | <u>14.1</u> | 569 | 14.1 | 570 | 14.1 | 560 | 14.3 | 559 | 14.3 | <u>560</u> | <u>14.3</u> |
| 447.dealII | 431 | 26.5 | 431 | 26.5 | <u>431</u> | <u>26.5</u> | 431 | 26.5 | 431 | 26.5 | <u>431</u> | <u>26.5</u> |
| 450.soplex | 479 | 17.4 | <u>480</u> | <u>17.4</u> | 481 | 17.3 | 479 | 17.4 | <u>480</u> | <u>17.4</u> | 481 | 17.3 |
| 453.povray | 243 | 21.9 | 242 | 22.0 | <u>243</u> | <u>21.9</u> | 193 | 27.6 | 191 | 27.8 | <u>192</u> | <u>27.8</u> |
| 454.calculix | <u>403</u> | <u>20.5</u> | 402 | 20.5 | 404 | 20.4 | 351 | 23.5 | <u>351</u> | <u>23.5</u> | 350 | 23.5 |
| 459.GemsFDTD | 165 | 64.4 | <u>136</u> | <u>77.8</u> | 127 | 83.7 | 91.2 | 116 | 103 | 103 | <u>100</u> | <u>106</u> |
| 465.tonto | <u>615</u> | <u>16.0</u> | 630 | 15.6 | 583 | 16.9 | 410 | 24.0 | <u>411</u> | <u>24.0</u> | 412 | 23.9 |
| 470.lbm | 25.0 | 549 | 31.2 | 440 | <u>30.4</u> | <u>452</u> | 25.0 | 549 | 31.2 | 440 | <u>30.4</u> | <u>452</u> |
| 481.wrf | 422 | 26.4 | 409 | 27.3 | <u>417</u> | <u>26.8</u> | 422 | 26.4 | 409 | 27.3 | <u>417</u> | <u>26.8</u> |
| 482.sphinx3 | 525 | 37.1 | 523 | 37.2 | <u>523</u> | <u>37.2</u> | 491 | 39.7 | 490 | 39.8 | <u>490</u> | <u>39.8</u> |

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

Operating System Notes

```
'ulimit -s unlimited' was used to set the stacksize to unlimited prior to run
'mount -t hugetlbfs nodev /mnt/hugepages' was used to enable large pages
echo 900 > /proc/sys/vm/nr_hugepages
export HUGETLB_MORECORE=yes
export LD_PRELOAD=/usr/lib64/libhugetlbfs.so
```

Platform Notes

BIOS Settings:
Power Management = Maximum Performance (Default = Active Power Controller)
Node Interleaving = Enabled (Default = Disabled)



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General Notes

The Dell PowerEdge R910 and the Bull NovaScale R480 F2 models are electronically equivalent. The results have been measured on a Dell PowerEdge R910 model.
OMP_NUM_THREADS set to number of cores
Binaries were compiled on RHEL5.5

Base Compiler Invocation

C benchmarks:

icc -m64

C++ benchmarks:

icpc -m64

Fortran benchmarks:

ifort -m64

Benchmarks using both Fortran and C:

icc -m64 ifort -m64

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 -nofor_main
436.cactusADM: -DSPEC_CPU_LP64 -nofor_main
437.leslie3d: -DSPEC_CPU_LP64
444.namd: -DSPEC_CPU_LP64
447.deallI: -DSPEC_CPU_LP64
450.soplex: -DSPEC_CPU_LP64
453.povray: -DSPEC_CPU_LP64
454.calculix: -DSPEC_CPU_LP64 -nofor_main
459.GemsFDTD: -DSPEC_CPU_LP64
465.tonto: -DSPEC_CPU_LP64
470.lbm: -DSPEC_CPU_LP64
481.wrf: -DSPEC_CPU_LP64 -DSPEC_CPU_CASE_FLAG -DSPEC_CPU_LINUX
482.sphinx3: -DSPEC_CPU_LP64

Base Optimization Flags

C benchmarks:

-xSSE4.2 -ipo -O3 -no-prec-div -static -parallel -opt-prefetch
-ansi-alias

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Base Optimization Flags (Continued)

C++ benchmarks:

-xSSE4.2 -ipo -O3 -no-prec-div -static -opt-prefetch -ansi-alias

Fortran benchmarks:

-xSSE4.2 -ipo -O3 -no-prec-div -static -parallel -opt-prefetch

Benchmarks using both Fortran and C:

-xSSE4.2 -ipo -O3 -no-prec-div -static -parallel -opt-prefetch
-ansi-alias

Peak Compiler Invocation

C benchmarks:

icc -m64

C++ benchmarks:

icpc -m64

Fortran benchmarks:

ifort -m64

Benchmarks using both Fortran and C:

icc -m64 ifort -m64

Peak Portability Flags

Same as Base Portability Flags

Peak Optimization Flags

C benchmarks:

433.milc: basepeak = yes

470.lbm: basepeak = yes

482.sphinx3: -xSSE4.2 -ipo -O3 -no-prec-div -unroll2 -ansi-alias
-parallel

C++ benchmarks:

444.namd: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)
-no-prec-div(pass 2) -prof-use(pass 2) -fno-alias
-auto-ilp32

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Peak Optimization Flags (Continued)

447.deallI: basepeak = yes

450.soplex: basepeak = yes

453.povray: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)
-no-prec-div(pass 2) -prof-use(pass 2) -unroll4 -ansi-alias
-B /usr/share/libhugetlbfs/ -Wl,-melf_x86_64 -Wl,-hugetlbfs-link=BDT

Fortran benchmarks:

410.bwaves: -xSSE4.2 -ipo -O3 -no-prec-div -opt-prefetch -parallel
-static

416.gamess: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)
-no-prec-div(pass 2) -prof-use(pass 2) -unroll2
-inline-level=0 -scalar-rep- -static

434.zeusmp: basepeak = yes

437.leslie3d: basepeak = yes

459.GemsFDTD: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)
-no-prec-div(pass 2) -prof-use(pass 2) -unroll2
-inline-level=0 -opt-prefetch -parallel
-B /usr/share/libhugetlbfs/ -Wl,-melf_x86_64 -Wl,-hugetlbfs-link=BDT

465.tonto: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)
-no-prec-div(pass 2) -prof-use(pass 2) -inline-calloc
-opt-malloc-options=3 -auto -unroll4
-B /usr/share/libhugetlbfs/ -Wl,-melf_x86_64 -Wl,-hugetlbfs-link=BDT

Benchmarks using both Fortran and C:

435.gromacs: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)
-no-prec-div(pass 2) -prof-use(pass 2) -static -auto-ilp32
-ansi-alias

436.cactusADM: basepeak = yes

454.calculix: -xSSE4.2 -ipo -O3 -no-prec-div -auto-ilp32 -ansi-alias

481.wrf: basepeak = yes

The flags files that were used to format this result can be browsed at

<http://www.spec.org/cpu2006/flags/Intel-ic12.0-linux64-revB.html>

<http://www.spec.org/cpu2006/flags/Intel-Linux64-Platform.20110524.00.html>

You can also download the XML flags sources by saving the following links:

<http://www.spec.org/cpu2006/flags/Intel-ic12.0-linux64-revB.xml>

<http://www.spec.org/cpu2006/flags/Intel-Linux64-Platform.20110524.00.xml>



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

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