



SPEC[®] CFP2006 Result

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Dell Inc.

SPECfp[®]2006 = 60.8

PowerEdge R610 (Intel Xeon X5675, 3.06 GHz)

SPECfp_base2006 = 58.0

CPU2006 license: 55

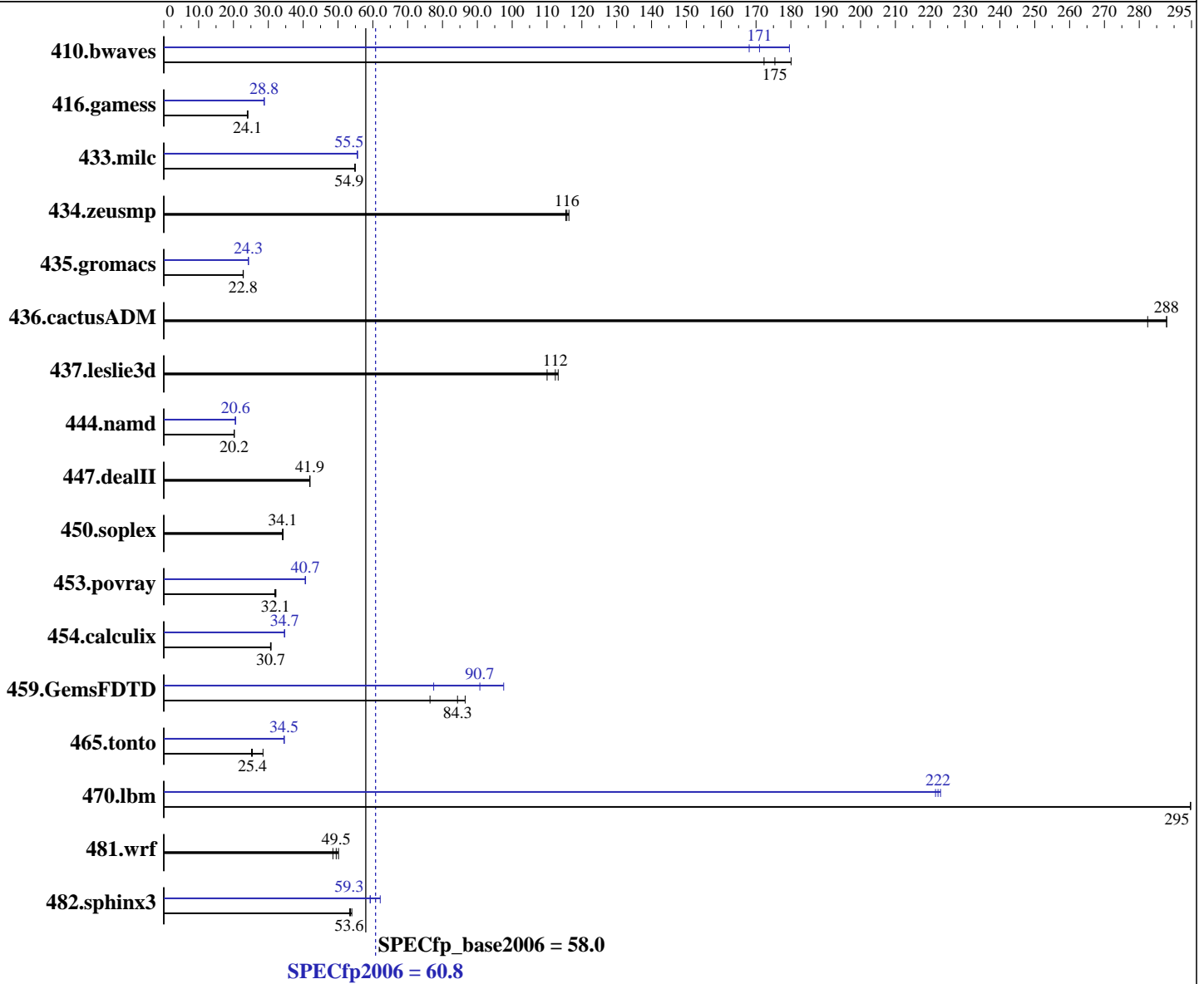
Test date: Feb-2011

Test sponsor: Dell Inc.

Hardware Availability: Feb-2011

Tested by: Dell Inc.

Software Availability: Apr-2011



Hardware

CPU Name: Intel Xeon X5675
 CPU Characteristics: Intel Turbo Boost Technology up to 3.46 GHz
 CPU MHz: 3067
 FPU: Integrated
 CPU(s) enabled: 12 cores, 2 chips, 6 cores/chip
 CPU(s) orderable: 1,2 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: 12 MB I+D on chip per chip
Other Cache: None
Memory: 48 GB (12 x 4 GB 2Rx4 PC3-10600R-9, ECC)
Disk Subsystem: 1 x 146 GB 15000 RPM SAS
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>77.5</u> | <u>175</u> | 78.9 | 172 | 75.5 | 180 | <u>79.5</u> | <u>171</u> | 75.7 | 180 | 80.9 | 168 |
| 416.gamess | 811 | 24.1 | <u>814</u> | <u>24.1</u> | 817 | 24.0 | 680 | 28.8 | <u>679</u> | <u>28.8</u> | 679 | 28.8 |
| 433.milc | <u>167</u> | <u>54.9</u> | 167 | 54.8 | 167 | 55.0 | <u>165</u> | <u>55.5</u> | 165 | 55.6 | 165 | 55.5 |
| 434.zeusmp | 78.9 | 115 | 78.3 | 116 | <u>78.7</u> | <u>116</u> | 78.9 | 115 | 78.3 | 116 | <u>78.7</u> | <u>116</u> |
| 435.gromacs | <u>313</u> | <u>22.8</u> | 314 | 22.8 | 313 | 22.8 | 294 | 24.3 | <u>294</u> | <u>24.3</u> | 294 | 24.3 |
| 436.cactusADM | 41.5 | 288 | <u>41.5</u> | <u>288</u> | 42.3 | 282 | 41.5 | 288 | <u>41.5</u> | <u>288</u> | 42.3 | 282 |
| 437.leslie3d | <u>83.6</u> | <u>112</u> | 85.4 | 110 | 83.0 | 113 | <u>83.6</u> | <u>112</u> | 85.4 | 110 | 83.0 | 113 |
| 444.namd | 397 | 20.2 | 397 | 20.2 | <u>397</u> | <u>20.2</u> | 390 | 20.5 | 390 | 20.6 | <u>390</u> | <u>20.6</u> |
| 447.dealII | <u>273</u> | <u>41.9</u> | 273 | 41.9 | 273 | 41.9 | <u>273</u> | <u>41.9</u> | 273 | 41.9 | 273 | 41.9 |
| 450.soplex | 243 | 34.3 | 245 | 34.1 | <u>244</u> | <u>34.1</u> | 243 | 34.3 | 245 | 34.1 | <u>244</u> | <u>34.1</u> |
| 453.povray | 167 | 31.8 | <u>166</u> | <u>32.1</u> | 165 | 32.2 | 131 | 40.6 | <u>131</u> | <u>40.7</u> | 131 | 40.7 |
| 454.calculix | 268 | 30.8 | 269 | 30.6 | <u>269</u> | <u>30.7</u> | 238 | 34.7 | 238 | 34.7 | <u>238</u> | <u>34.7</u> |
| 459.GemsFDTD | 139 | 76.4 | 123 | 86.5 | <u>126</u> | <u>84.3</u> | <u>117</u> | <u>90.7</u> | 137 | 77.5 | 109 | 97.6 |
| 465.tonto | <u>387</u> | <u>25.4</u> | 346 | 28.5 | 391 | 25.2 | 284 | 34.6 | 285 | 34.5 | <u>285</u> | <u>34.5</u> |
| 470.lbm | 46.6 | 295 | 46.6 | 295 | <u>46.6</u> | <u>295</u> | 62.0 | 222 | <u>61.8</u> | <u>222</u> | 61.6 | 223 |
| 481.wrf | 223 | 50.2 | <u>226</u> | <u>49.5</u> | 230 | 48.5 | 223 | 50.2 | <u>226</u> | <u>49.5</u> | 230 | 48.5 |
| 482.sphinx3 | 366 | 53.3 | 361 | 54.0 | <u>364</u> | <u>53.6</u> | 314 | 62.1 | 329 | 59.2 | <u>329</u> | <u>59.3</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)
Data Reuse = Disabled (Default = Enabled)
Logical Processor = Disabled (Default = Enabled)



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General Notes

OMP_NUM_THREADS set to number of cores
The Dell PowerEdge R610 and
the Bull NovaScale R440 F2 models are electronically equivalent.
The results have been measured on a Dell PowerEdge R610 model.

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.dealII: -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: -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

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

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

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Peak Optimization Flags (Continued)

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

447.dealIII: 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



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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.20110308.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.20110308.xml>

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