# SPEC® CFP2006 Result

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## Dell Inc.

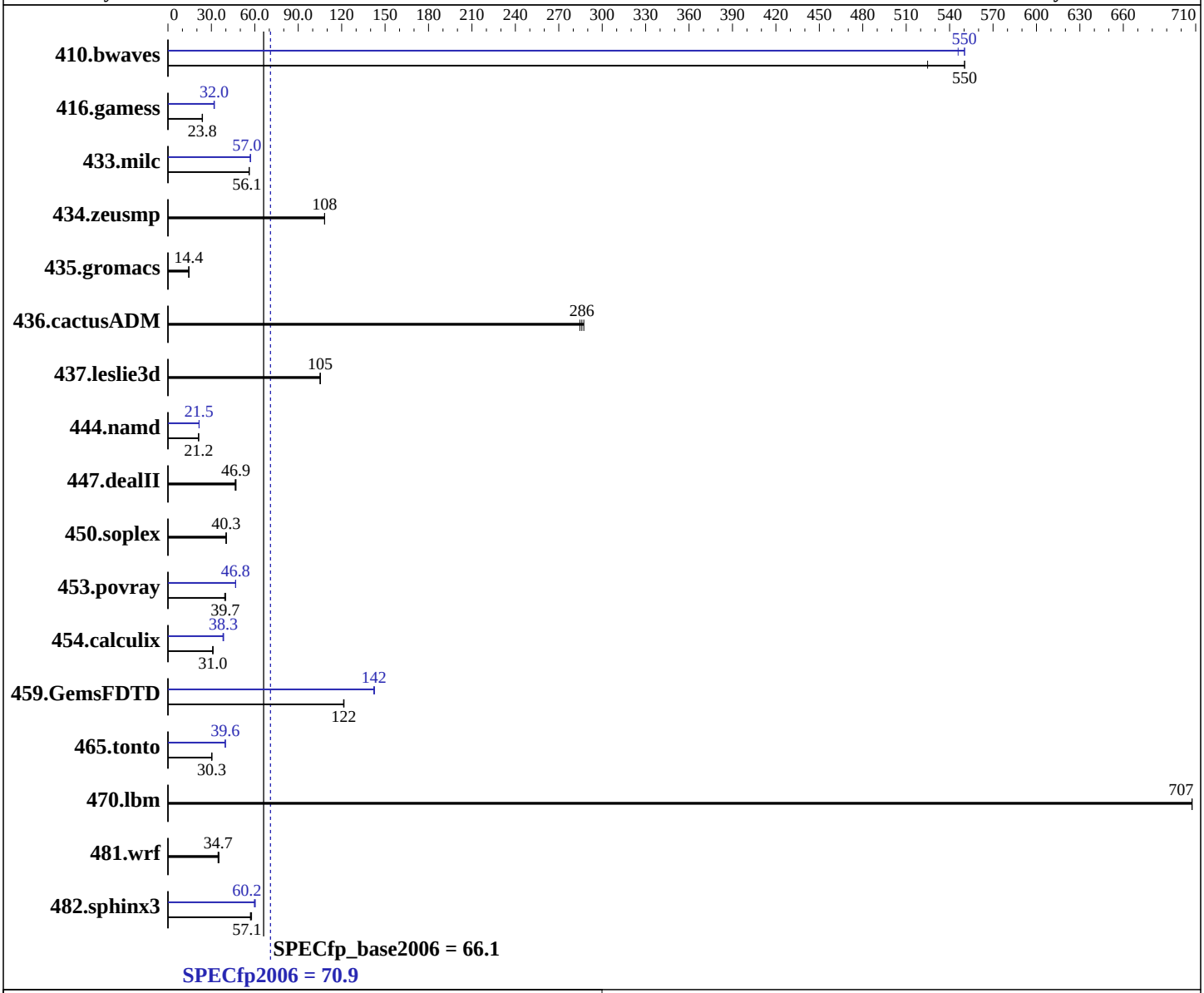
PowerEdge M820 (Intel Xeon E5-4650L, 2.60 GHz)

SPECfp®2006 = 70.9

SPECfp_base2006 = 66.1

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

**Test date:** Apr-2012
**Hardware Availability:** Aug-2012
**Software Availability:** Feb-2012




## Hardware

| | |
|---|---|
| CPU Name: | Intel Xeon E5-4650L |
| CPU Characteristics: | Intel Turbo Boost Technology up to 3.10 GHz |
| CPU MHz: | 2600 |
| FPU: | Integrated |
| CPU(s) enabled: | 32 cores, 4 chips, 8 cores/chip, 2 threads/core |
| CPU(s) orderable: | 2,4 chip |
| 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 SP2 (x86_64) 3.0.13-0.27-default |
| Compiler: | C/C++: Version 12.1.0.225 of Intel C++ Studio XE for Linux; Fortran: Version 12.1.0.225 of Intel Fortran Studio XE for Linux |
| Auto Parallel: | Yes |
| File System: | ext3 |
| System State: | Run level 3 (multi-user) |

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| | |
|---|---|
| L3 Cache: | 20 MB I+D on chip per chip |
| Other Cache: | None |
| Memory: | 256 GB (32 x 8 GB 2Rx4 PC3-12800R-11, ECC) |
| Disk Subsystem: | 1 x 900 GB 10000 RPM SAS |
| Other Hardware: | None |

| | |
|---|---|
| Base Pointers: | 64-bit |
| 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 | 25.9 | 525 | 24.7 | 550 | **24.7** | **550** | **24.7** | **550** | 24.7 | 550 | 24.9 | 546 |
| 416.gamess | **824** | **23.8** | 820 | 23.9 | 828 | 23.7 | **612** | **32.0** | 616 | 31.8 | 611 | 32.0 |
| 433.milc | 164 | 56.1 | **164** | **56.1** | 164 | 56.1 | **161** | **57.0** | 161 | 57.0 | 161 | 57.0 |
| 434.zeusmp | **84.1** | **108** | 84.1 | 108 | 84.1 | 108 | **84.1** | **108** | 84.1 | 108 | 84.1 | 108 |
| 435.gromacs | 496 | 14.4 | **495** | **14.4** | 493 | 14.5 | 496 | 14.4 | **495** | **14.4** | 493 | 14.5 |
| 436.cactusADM | **41.8** | **286** | 41.6 | 287 | 42.0 | 285 | **41.8** | **286** | 41.6 | 287 | 42.0 | 285 |
| 437.leslie3d | 89.5 | 105 | 89.3 | 105 | **89.3** | **105** | 89.5 | 105 | 89.3 | 105 | **89.3** | **105** |
| 444.namd | 379 | 21.2 | 379 | 21.2 | **379** | **21.2** | 373 | 21.5 | 373 | 21.5 | **373** | **21.5** |
| 447.dealII | **244** | **46.9** | 246 | 46.4 | 243 | 47.0 | **244** | **46.9** | 246 | 46.4 | 243 | 47.0 |
| 450.soplex | **207** | **40.3** | 207 | 40.3 | 208 | 40.1 | **207** | **40.3** | 207 | 40.3 | 208 | 40.1 |
| 453.povray | 134 | 39.8 | 136 | 39.2 | **134** | **39.7** | 114 | 46.8 | **114** | **46.8** | 114 | 46.7 |
| 454.calculix | **266** | **31.0** | 265 | 31.1 | 267 | 30.9 | 217 | 38.0 | **215** | **38.3** | 215 | 38.4 |
| 459.GemsFDTD | 87.5 | 121 | 87.3 | 122 | **87.3** | **122** | **74.6** | **142** | 74.6 | 142 | 74.4 | 143 |
| 465.tonto | **325** | **30.3** | 324 | 30.4 | 326 | 30.2 | 249 | 39.6 | **248** | **39.6** | 248 | 39.7 |
| 470.lbm | 19.4 | 707 | **19.4** | **707** | 19.4 | 707 | 19.4 | 707 | **19.4** | **707** | 19.4 | 707 |
| 481.wrf | 317 | 35.3 | **322** | **34.7** | 323 | 34.6 | 317 | 35.3 | **322** | **34.7** | 323 | 34.6 |
| 482.sphinx3 | 337 | 57.8 | 342 | 57.0 | **341** | **57.1** | 327 | 59.7 | 324 | 60.2 | **324** | **60.2** |

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

## Operating System Notes

```
Stack size set to unlimited using "ulimit -s unlimited"
```

## Platform Notes

```
CPU Power Management set to Maximum Performance
Memory Frequency set to Maximum Performance
Turbo Boost set to Enabled
C States/C1E set to Enabled
Sysinfo program /root/CPU2006-1.2/config/sysinfo.rev6800
$Rev: 6800 $ $Date:: 2011-10-11 #$ 6f2ebdff5032aaa42e583f96b07f99d3
running on linux-0j3r Tue Apr 24 13:12:31 2012

This section contains SUT (System Under Test) info as seen by
some common utilities.  To remove or add to this section, see:
```

Continued on next page

## Platform Notes (Continued)

```
      http://www.spec.org/cpu2006/Docs/config.html#sysinfo

    From /proc/cpuinfo
       model name : Intel(R) Xeon(R) CPU E5-4650L 0 @ 2.60GHz
          4 "physical id"s (chips)
          64 "processors"
       cores, siblings (Caution: counting these is hw and system dependent.  The
       following excerpts from /proc/cpuinfo might not be reliable.  Use with
       caution.)
          cpu cores : 8
          siblings  : 16
          physical 0: cores 0 1 2 3 4 5 6 7
          physical 1: cores 0 1 2 3 4 5 6 7
          physical 2: cores 0 1 2 3 4 5 6 7
          physical 3: cores 0 1 2 3 4 5 6 7
       cache size : 20480 KB

    From /proc/meminfo
       MemTotal:       264501520 kB
       HugePages_Total:       0
       Hugepagesize:       2048 kB

    /usr/bin/lsb_release -d
       SUSE Linux Enterprise Server 11 (x86_64)

    From /etc/*release* /etc/*version*
       SuSE-release:
          SUSE Linux Enterprise Server 11 (x86_64)
          VERSION = 11
          PATCHLEVEL = 2

    uname -a:
       Linux linux-0j3r 3.0.13-0.27-default #1 SMP Wed Feb 15 13:33:49 UTC 2012
       (d73692b) x86_64 x86_64 x86_64 GNU/Linux

    run-level 3 Apr 24 06:01 last=S

    SPEC is set to: /root/CPU2006-1.2
       Filesystem     Type  Size  Used Avail Use% Mounted on
       /dev/sda1      ext3  886G  132G  710G  16% /

    Additional information from dmidecode:

    (End of data from sysinfo program)
```

## General Notes

```
Environment variables set by runspec before the start of the run:
KMP_AFFINITY = "granularity=fine,scatter"
LD_LIBRARY_PATH = "/root/CPU2006-1.2/libs/32:/root/CPU2006-1.2/libs/64"
OMP_NUM_THREADS = "32"
```

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## General Notes (Continued)

```
Binaries compiled on a system with 1x Core i7-860 CPU + 8GB
memory using RHEL5.5
Transparent Huge Pages disabled with:
echo never  > /sys/kernel/mm/transparent_hugepage/enabled
Filesystem page cache cleared with:
echo 1>       /proc/sys/vm/drop_caches
```

## 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:
-xAVX -ipo -O3 -no-prec-div -static -parallel -opt-prefetch
-ansi-alias

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## Base Optimization Flags (Continued)

C++ benchmarks:
`-xAVX -ipo -O3 -no-prec-div -static -opt-prefetch -ansi-alias`

Fortran benchmarks:
`-xAVX -ipo -O3 -no-prec-div -static -parallel -opt-prefetch`

Benchmarks using both Fortran and C:
`-xAVX -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: `-xAVX`(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: `basepeak = yes`

482.sphinx3: `-xAVX -ipo -O3 -no-prec-div -unroll2 -ansi-alias -parallel`

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## Peak Optimization Flags (Continued)

C++ benchmarks:

444.namd: -xAVX(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.dealII: basepeak = yes

450.soplex: basepeak = yes

453.povray: -xAVX(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2) -prof-use(pass 2) -unroll4 -ansi-alias

Fortran benchmarks:

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

416.gamess: -xAVX(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: -xAVX(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

465.tonto: -xAVX(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

Benchmarks using both Fortran and C:

435.gromacs: basepeak = yes

436.cactusADM: basepeak = yes

454.calculix: -xAVX -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-ic12.1-official-linux64.20111122.html
http://www.spec.org/cpu2006/flags/Dell-Platform-Settings-V1.2-revA.20120410.00.html

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

http://www.spec.org/cpu2006/flags/Intel-ic12.1-official-linux64.20111122.xml
http://www.spec.org/cpu2006/flags/Dell-Platform-Settings-V1.2-revA.20120410.00.xml


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

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