# SPEC® CFP2006 Result

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## Dell Inc.

PowerEdge R730 (Intel Xeon E5-2680 v3, 2.50 GHz)

$SPECfp^{®}2006 = $ 106

$SPECfp\_base2006 = $ 102

**CPU2006 license:** 55                                   **Test date:** Sep-2014
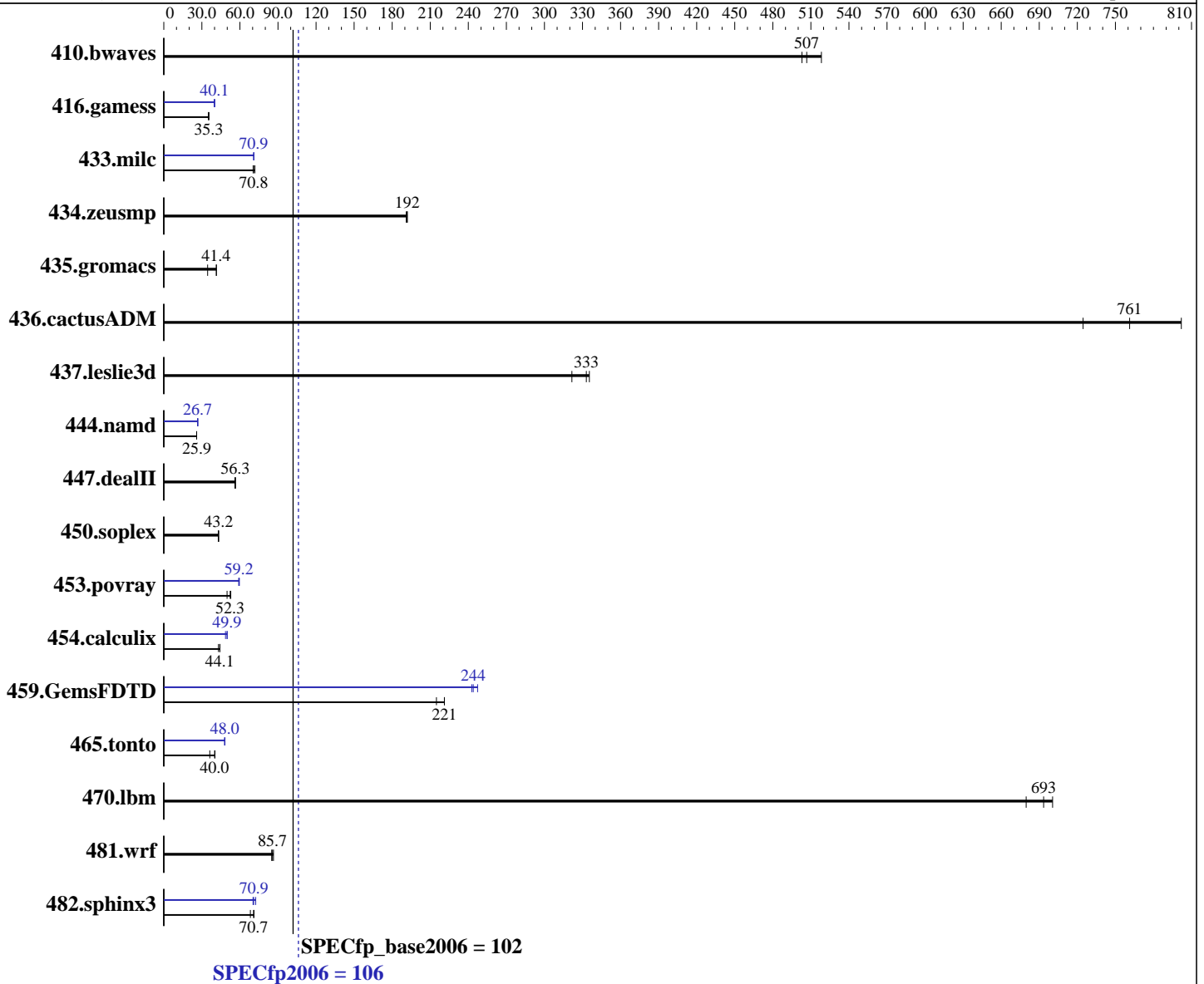**Test sponsor:** Dell Inc.                              **Hardware Availability:** Sep-2014
**Tested by:** Dell Inc.                                 **Software Availability:** Sep-2014

| Benchmark | Value |
|---|---|
| 410.bwaves | 507 |
| 416.gamess | 40.1 / 35.3 |
| 433.milc | 70.9 / 70.8 |
| 434.zeusmp | 192 |
| 435.gromacs | 41.4 |
| 436.cactusADM | 761 |
| 437.leslie3d | 333 |
| 444.namd | 26.7 / 25.9 |
| 447.dealII | 56.3 |
| 450.soplex | 43.2 |
| 453.povray | 59.2 / 52.3 |
| 454.calculix | 49.9 / 44.1 |
| 459.GemsFDTD | 244 / 221 |
| 465.tonto | 48.0 / 40.0 |
| 470.lbm | 693 |
| 481.wrf | 85.7 |
| 482.sphinx3 | 70.9 / 70.7 |

SPECfp_base2006 = 102

SPECfp2006 = 106

## Hardware

| | |
|---|---|
| CPU Name: | Intel Xeon E5-2680 v3 |
| CPU Characteristics: | Intel Turbo Boost Technology up to 3.30 GHz |
| CPU MHz: | 2500 |
| FPU: | Integrated |
| CPU(s) enabled: | 24 cores, 2 chips, 12 cores/chip, 2 threads/core |
| CPU(s) orderable: | 1,2 chip |
| Primary Cache: | 32 KB I + 32 KB D on chip per core |
| Secondary Cache: | 256 KB I+D on chip per core |

**Continued on next page**

## Software

| | |
|---|---|
| Operating System: | SUSE Linux Enterprise Server 11 (x86_64) 3.0.76-0.11-default |
| Compiler: | C/C++: Version 14.0.0.080 of Intel C++ Studio XE for Linux; Fortran: Version 14.0.0.080 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: | 30 MB I+D on chip per chip | Base Pointers: | 64-bit |
| Other Cache: | None | Peak Pointers: | 32/64-bit |
| Memory: | 256 GB (16 x 16 GB 2Rx4 PC4-2133P-R) | Other Software: | None |
| Disk Subsystem: | 1 x 250 GB 7200 RPM SATA | | |
| Other Hardware: | None | | |

## Results Table

| Benchmark | Base | | | | | | Peak | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio |
| 410.bwaves | **26.8** | **507** | 27.0 | 503 | 26.2 | 518 | **26.8** | **507** | 27.0 | 503 | 26.2 | 518 |
| 416.gamess | 550 | 35.6 | **555** | **35.3** | 556 | 35.2 | 492 | 39.8 | **489** | **40.1** | 489 | 40.1 |
| 433.milc | **130** | **70.8** | 128 | 71.8 | 130 | 70.4 | **130** | **70.9** | 130 | 70.9 | 129 | 71.0 |
| 434.zeusmp | 47.6 | 191 | 47.4 | 192 | **47.4** | **192** | 47.6 | 191 | 47.4 | 192 | **47.4** | **192** |
| 435.gromacs | **172** | **41.4** | 207 | 34.5 | 172 | 41.4 | **172** | **41.4** | 207 | 34.5 | 172 | 41.4 |
| 436.cactusADM | 16.5 | 725 | **15.7** | **761** | 14.9 | 802 | 16.5 | 725 | **15.7** | **761** | 14.9 | 802 |
| 437.leslie3d | 28.0 | 335 | 29.2 | 322 | **28.2** | **333** | 28.0 | 335 | 29.2 | 322 | **28.2** | **333** |
| 444.namd | 310 | 25.9 | **310** | **25.9** | 310 | 25.9 | 300 | 26.7 | 300 | 26.7 | **300** | **26.7** |
| 447.dealII | **203** | **56.3** | 202 | 56.5 | 204 | 56.1 | **203** | **56.3** | 202 | 56.5 | 204 | 56.1 |
| 450.soplex | 193 | 43.2 | **193** | **43.2** | 194 | 42.9 | 193 | 43.2 | **193** | **43.2** | 194 | 42.9 |
| 453.povray | 101 | 52.8 | **102** | **52.3** | 107 | 49.9 | 90.0 | 59.1 | **89.9** | **59.2** | 89.3 | 59.6 |
| 454.calculix | **187** | **44.1** | 186 | 44.3 | 192 | 43.1 | **165** | **49.9** | 170 | 48.6 | 165 | 49.9 |
| 459.GemsFDTD | 48.0 | 221 | **48.0** | **221** | 49.4 | 215 | 42.9 | 247 | **43.5** | **244** | 43.7 | 243 |
| 465.tonto | 244 | 40.3 | 271 | 36.2 | **246** | **40.0** | **205** | **48.0** | 205 | 47.9 | 204 | 48.2 |
| 470.lbm | 20.2 | 680 | **19.8** | **693** | 19.6 | 700 | 20.2 | 680 | **19.8** | **693** | 19.6 | 700 |
| 481.wrf | 129 | 86.4 | 131 | 85.0 | **130** | **85.7** | 129 | 86.4 | 131 | 85.0 | **130** | **85.7** |
| 482.sphinx3 | 286 | 68.2 | **276** | **70.7** | 274 | 71.1 | **275** | **70.9** | 277 | 70.3 | 269 | 72.4 |

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

    BIOS settings:
    Snoop Mode set to Home Snoop
    Virtualization Technology disabled
    Execute Disable disabled
    System Profile set to Custom
    CPU Power Management set to Maximum Performance
    Sysinfo program /root/cpu2006-1.2/config/sysinfo.rev6818
    $Rev: 6818 $ $Date:: 2012-07-17 #$ e86d102572650a6e4d596a3cee98f191
    running on linux-fm7q Tue Sep  9 10:37:59 2014

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PowerEdge R730 (Intel Xeon E5-2680 v3, 2.50 GHz)

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$SPECfp\_base2006 =$ 102

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**Tested by:** Dell Inc.

**Test date:** Sep-2014
**Hardware Availability:** Sep-2014
**Software Availability:** Sep-2014

## Platform Notes (Continued)

```
This section contains SUT (System Under Test) info as seen by
some common utilities.  To remove or add to this section, see:
  http://www.spec.org/cpu2006/Docs/config.html#sysinfo

From /proc/cpuinfo
   model name : Intel(R) Xeon(R) CPU E5-2680 v3 @ 2.50GHz
      2 "physical id"s (chips)
      48 "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 : 12
      siblings  : 24
      physical 0: cores 0 1 2 3 4 5 8 9 10 11 12 13
      physical 1: cores 0 1 2 3 4 5 8 9 10 11 12 13
   cache size : 30720 KB

From /proc/meminfo
   MemTotal:       264441052 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 = 3

uname -a:
   Linux linux-fm7q 3.0.76-0.11-default #1 SMP Fri Jun 14 08:21:43 UTC 2013
   (ccab990) x86_64 x86_64 x86_64 GNU/Linux

run-level 3 Sep 9 05:01 last=S

SPEC is set to: /root/cpu2006-1.2
   Filesystem      Type  Size  Used Avail Use% Mounted on
   /dev/sda2       ext3  228G   11G  216G   5% /

Additional information from dmidecode:
  BIOS Dell Inc. 1.0.4 08/28/2014
  Memory:
   4x 00AD00B300AD HMA42GR7MFR4N-TFTD 16 GB 2133 MHz
   6x 00AD063200AD HMA42GR7MFR4N-TFT1 16 GB 2133 MHz
   6x 00CE00B300CE M393A2G40DB0-CPB 16 GB 2133 MHz
   8x Not Specified Not Specified

(End of data from sysinfo program)
```

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## General Notes

```
Environment variables set by runspec before the start of the run:
LD_LIBRARY_PATH = "/root/cpu2006-1.2/libs/32:/root/cpu2006-1.2/libs/64:/root/cpu2006-1.2/sh"
OMP_NUM_THREADS = "24"

 Binaries compiled on a system with 1x Core i7-860 CPU + 8GB
 memory using RedHat EL 6.4
 Transparent Huge Pages enabled with:
 echo always > /sys/kernel/mm/transparent_hugepage/enabled
 Filesystem page cache cleared with:
 echo 1>         /proc/sys/vm/drop_caches
 runspec command invoked through numactl i.e.:
 numactl --interleave=all runspec <etc>
```

## 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
```

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## Base Optimization Flags

C benchmarks:
```
-xCORE-AVX2 -ipo -O3 -no-prec-div -parallel -opt-prefetch
-ansi-alias
```

C++ benchmarks:
```
-xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch -ansi-alias
```

Fortran benchmarks:
```
-xCORE-AVX2 -ipo -O3 -no-prec-div -parallel -opt-prefetch
```

Benchmarks using both Fortran and C:
```
-xCORE-AVX2 -ipo -O3 -no-prec-div -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: -xCORE-AVX2(pass 2) -prof-gen(pass 1) -ipo(pass 2)
             -O3(pass 2) -no-prec-div(pass 2) -prof-use(pass 2)
             -auto-ilp32 -ansi-alias

   470.lbm: basepeak = yes

482.sphinx3: -xCORE-AVX2 -ipo -O3 -no-prec-div -unroll2 -ansi-alias
             -parallel
```

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# Peak Optimization Flags (Continued)

C++ benchmarks:

    444.namd: `-xCORE-AVX2(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: `-xCORE-AVX2(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: basepeak = yes

    416.gamess: `-xCORE-AVX2(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-`

    434.zeusmp: basepeak = yes

    437.leslie3d: basepeak = yes

  459.GemsFDTD: `-xCORE-AVX2(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: `-xCORE-AVX2(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: `-xCORE-AVX2 -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-ic14.0-official-linux64-revC.html
http://www.spec.org/cpu2006/flags/Dell-Platform-Settings-V1.2-revD.html

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

http://www.spec.org/cpu2006/flags/Intel-ic14.0-official-linux64-revC.xml
http://www.spec.org/cpu2006/flags/Dell-Platform-Settings-V1.2-revD.xml

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Tested with SPEC CPU2006 v1.2.
Report generated on Wed Oct 8 19:40:39 2014 by SPEC CPU2006 PS/PDF formatter v6932.
Originally published on 8 October 2014.