# SPEC® CFP2006 Result

## Dell Inc.

PowerEdge R730 (Intel Xeon E5-2667 v3, 3.20 GHz)

$SPECfp^{®}\_rate2006 = 671$

$SPECfp\_rate\_base2006 = 653$

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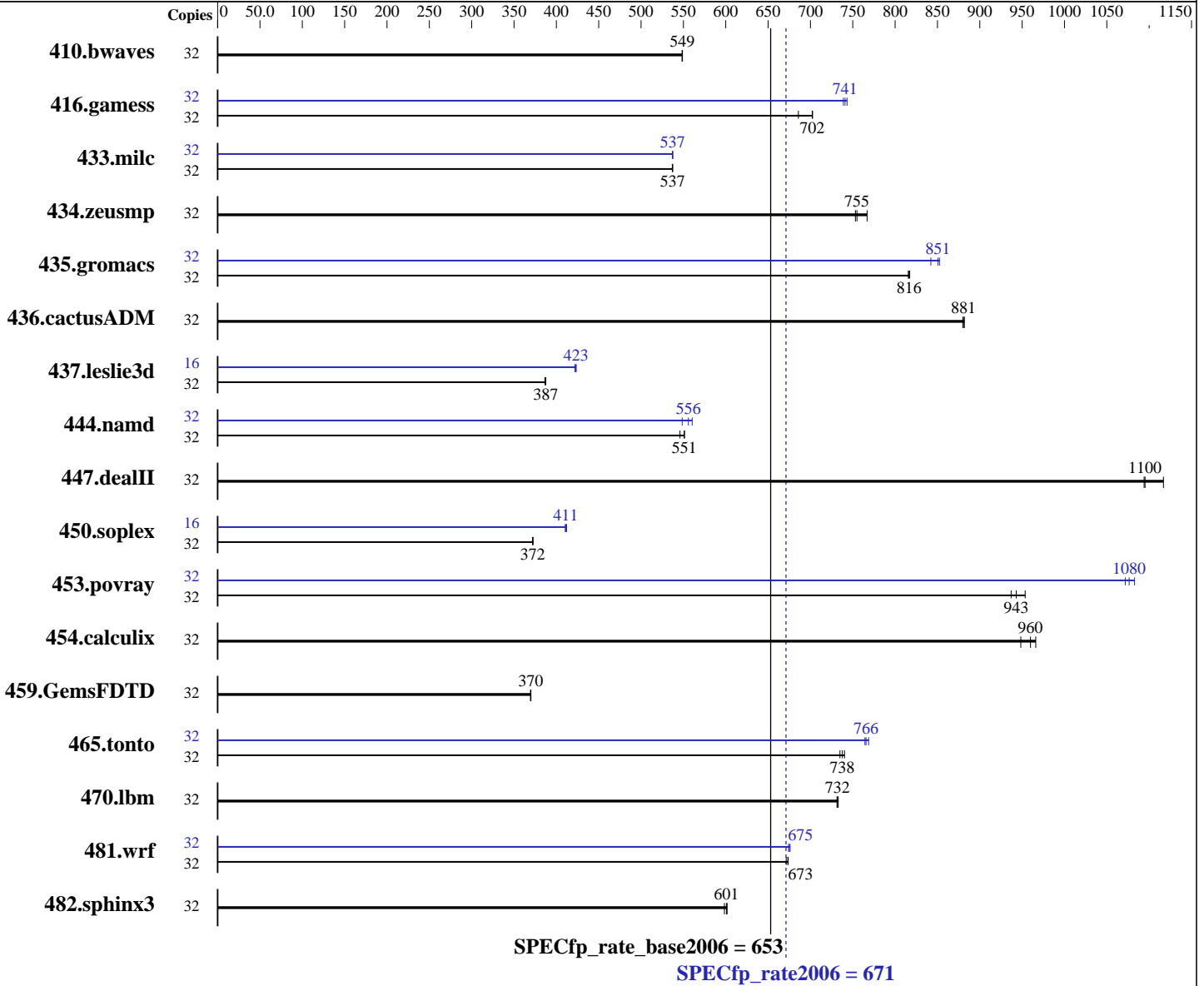**Test sponsor:** Dell Inc.
**Tested by:** Dell Inc.

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

| Benchmark | Copies | Result |
|---|---|---|
| 410.bwaves | 32 | 549 |
| 416.gamess | 32 | 741 |
| 416.gamess | 32 | 702 |
| 433.milc | 32 | 537 |
| 433.milc | 32 | 537 |
| 434.zeusmp | 32 | 755 |
| 435.gromacs | 32 | 851 |
| 435.gromacs | 32 | 816 |
| 436.cactusADM | 32 | 881 |
| 437.leslie3d | 16 | 423 |
| 437.leslie3d | 32 | 387 |
| 444.namd | 32 | 556 |
| 444.namd | 32 | 551 |
| 447.dealII | 32 | 1100 |
| 450.soplex | 16 | 411 |
| 450.soplex | 32 | 372 |
| 453.povray | 32 | 1080 |
| 453.povray | 32 | 943 |
| 454.calculix | 32 | 960 |
| 459.GemsFDTD | 32 | 370 |
| 465.tonto | 32 | 766 |
| 465.tonto | 32 | 738 |
| 470.lbm | 32 | 732 |
| 481.wrf | 32 | 675 |
| 481.wrf | 32 | 673 |
| 482.sphinx3 | 32 | 601 |

**SPECfp_rate_base2006 = 653**

**SPECfp_rate2006 = 671**

## Hardware

| | |
|---|---|
| CPU Name: | Intel Xeon E5-2667 v3 |
| CPU Characteristics: | Intel Turbo Boost Technology up to 3.60 GHz |
| CPU MHz: | 3200 |
| FPU: | Integrated |
| CPU(s) enabled: | 16 cores, 2 chips, 8 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: | No |
| File System: | ext2 |
| System State: | Run level 3 (multi-user) |

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| | | | |
|---|---|---|---|
| L3 Cache: | 20 MB I+D on chip per chip | Base Pointers: | 32/64-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 300 GB 15000 RPM SAS | | |
| Other Hardware: | None | | |

## Results Table

| Benchmark | Base | | | | | | | Peak | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Copies | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | Copies | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio |
| 410.bwaves | 32 | 793 | 548 | **793** | **549** | 792 | 549 | 32 | 793 | 548 | **793** | **549** | 792 | 549 |
| 416.gamess | 32 | **892** | **702** | 914 | 686 | 892 | 703 | 32 | 843 | 743 | 848 | 739 | **846** | **741** |
| 433.milc | 32 | 547 | 537 | 547 | 537 | **547** | **537** | 32 | 547 | 537 | **547** | **537** | 547 | 537 |
| 434.zeusmp | 32 | 380 | 767 | 387 | 753 | **386** | **755** | 32 | 380 | 767 | 387 | 753 | **386** | **755** |
| 435.gromacs | 32 | 280 | 816 | **280** | **816** | 280 | 817 | 32 | 268 | 852 | 271 | 842 | **269** | **851** |
| 436.cactusADM | 32 | 434 | 882 | 435 | 880 | **434** | **881** | 32 | 434 | 882 | 435 | 880 | **434** | **881** |
| 437.leslie3d | 32 | 779 | 386 | 776 | 388 | **776** | **387** | 16 | 357 | 422 | **355** | **423** | 355 | 423 |
| 444.namd | 32 | 470 | 546 | **466** | **551** | 466 | 551 | 32 | **462** | **556** | 458 | 560 | 468 | 549 |
| 447.dealII | 32 | 328 | 1120 | **334** | **1100** | 335 | 1090 | 32 | 328 | 1120 | **334** | **1100** | 335 | 1090 |
| 450.soplex | 32 | **717** | **372** | 717 | 372 | 717 | 372 | 16 | 324 | 412 | 325 | 410 | **325** | **411** |
| 453.povray | 32 | 179 | 954 | **181** | **943** | 182 | 937 | 32 | 159 | 1070 | 157 | 1080 | **158** | **1080** |
| 454.calculix | 32 | 273 | 966 | 278 | 948 | **275** | **960** | 32 | 273 | 966 | 278 | 948 | **275** | **960** |
| 459.GemsFDTD | 32 | **918** | **370** | 919 | 369 | 918 | 370 | 32 | **918** | **370** | 919 | 369 | 918 | 370 |
| 465.tonto | 32 | 428 | 735 | **427** | **738** | 425 | 740 | 32 | 410 | 769 | 412 | 764 | **411** | **766** |
| 470.lbm | 32 | 601 | 731 | **601** | **732** | 600 | 733 | 32 | 601 | 731 | **601** | **732** | 600 | 733 |
| 481.wrf | 32 | 531 | 674 | 532 | 671 | **531** | **673** | 32 | 529 | 676 | 530 | 674 | **529** | **675** |
| 482.sphinx3 | 32 | 1042 | 598 | 1037 | 602 | **1038** | **601** | 32 | 1042 | 598 | 1037 | 602 | **1038** | **601** |

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

## Submit Notes

The numactl mechanism was used to bind copies to processors. The config file option 'submit' was used to generate numactl commands to bind each copy to a specific processor. For details, please see the config file.

## Operating System Notes

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

## Platform Notes

BIOS settings:
Snoop Mode set to Cluster on Die
Virtualization Technology disabled

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## Platform Notes (Continued)

```
Execute Disable disabled
System Profile set to Performance
Sysinfo program /root/cpu2006-1.2/config/sysinfo.rev6818
$Rev: 6818 $ $Date:: 2012-07-17 #$ e86d102572650a6e4d596a3cee98f191
running on linux Sat Jun 21 00:40:18 2014

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 E5-2667 v3 @ 3.20GHz
      2 "physical id"s (chips)
      32 "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
   cache size : 20480 KB

From /proc/meminfo
   MemTotal:        264572220 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 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 Jun 20 14:44 last=S

SPEC is set to: /root/cpu2006-1.2
   Filesystem      Type  Size  Used Avail Use% Mounted on
   /dev/sda2       ext2  267G  8.8G  257G   4% /

Additional information from dmidecode:
  BIOS Dell Inc. 0.3.24 06/12/2014
  Memory:
   1x 00AD00B300AD HMA42GR7MFR4N-TFTD 16 GB 2133 MHz
   8x 00AD063200AD HMA42GR7MFR4N-TFT1 16 GB 2133 MHz
```
Continued on next page

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$SPECfp\_rate2006 =$ **671**

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## Platform Notes (Continued)

```
     7x 00CE00B300CE M393A2G40DB0-CPB 16 GB 2133 MHz
     8x Not Specified Not Specified

  (End of data from sysinfo program)
```

## 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"

 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
```

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|---|---|---|---|
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## Base Portability Flags (Continued)

```
    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:

```
-xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch -auto-p32
-ansi-alias -opt-mem-layout-trans=3
```

C++ benchmarks:

```
-xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch -auto-p32
-ansi-alias -opt-mem-layout-trans=3
```

Fortran benchmarks:

```
-xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch
```

Benchmarks using both Fortran and C:

```
-xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch -auto-p32
-ansi-alias -opt-mem-layout-trans=3
```

## Peak Compiler Invocation

C benchmarks:

```
icc    -m64
```

C++ benchmarks (except as noted below):

```
icpc   -m64
```

```
  450.soplex: icpc -m32
```

Fortran benchmarks:

```
ifort -m64
```

Benchmarks using both Fortran and C:

```
icc    -m64 ifort -m64
```

## Peak Portability Flags

```
    410.bwaves: -DSPEC_CPU_LP64
```

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# Peak Portability Flags (Continued)

```
      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
      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
```

# 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)
                  -opt-mem-layout-trans=3(pass 2) -prof-use(pass 2)
                  -auto-ilp32

        470.lbm: basepeak = yes

     482.sphinx3: basepeak = yes
```

C++ benchmarks:

```
        444.namd: -xCORE-AVX2(pass 2) -prof-gen(pass 1) -ipo(pass 2)
                  -O3(pass 2) -no-prec-div(pass 2)
                  -opt-mem-layout-trans=3(pass 2) -prof-use(pass 2) -fno-alias
                  -auto-ilp32

       447.dealII: basepeak = yes

      450.soplex: -xCORE-AVX2(pass 2) -prof-gen(pass 1) -ipo(pass 2)
                  -O3(pass 2) -no-prec-div(pass 2)
                  -opt-mem-layout-trans=3(pass 2) -prof-use(pass 2)
                  -opt-malloc-options=3

      453.povray: -xCORE-AVX2(pass 2) -prof-gen(pass 1) -ipo(pass 2)
                  -O3(pass 2) -no-prec-div(pass 2)
                  -opt-mem-layout-trans=3(pass 2) -prof-use(pass 2) -unroll4
                  -ansi-alias
```

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# Peak Optimization Flags (Continued)

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: -xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch

  459.GemsFDTD: basepeak = yes

      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) -unroll4
            -auto -inline-calloc -opt-malloc-options=3

Benchmarks using both Fortran and C:

    435.gromacs: -xCORE-AVX2(pass 2) -prof-gen(pass 1) -ipo(pass 2)
            -O3(pass 2) -no-prec-div(pass 2)
            -opt-mem-layout-trans=3(pass 2) -prof-use(pass 2)
            -opt-prefetch -auto-ilp32

  436.cactusADM: basepeak = yes

   454.calculix: basepeak = yes

      481.wrf: -xCORE-AVX2 -ipo -O3 -no-prec-div -auto-ilp32

---

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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For questions about this result, please contact the tester.
For other inquiries, please contact webmaster@spec.org.

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