



SPEC[®] CFP2006 Result

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Dell Inc.

PowerEdge R730 (Intel Xeon E5-2650L v3, 1.80 GHz)

SPECfp[®]2006 = 86.6

SPECfp_base2006 = 83.1

CPU2006 license: 55

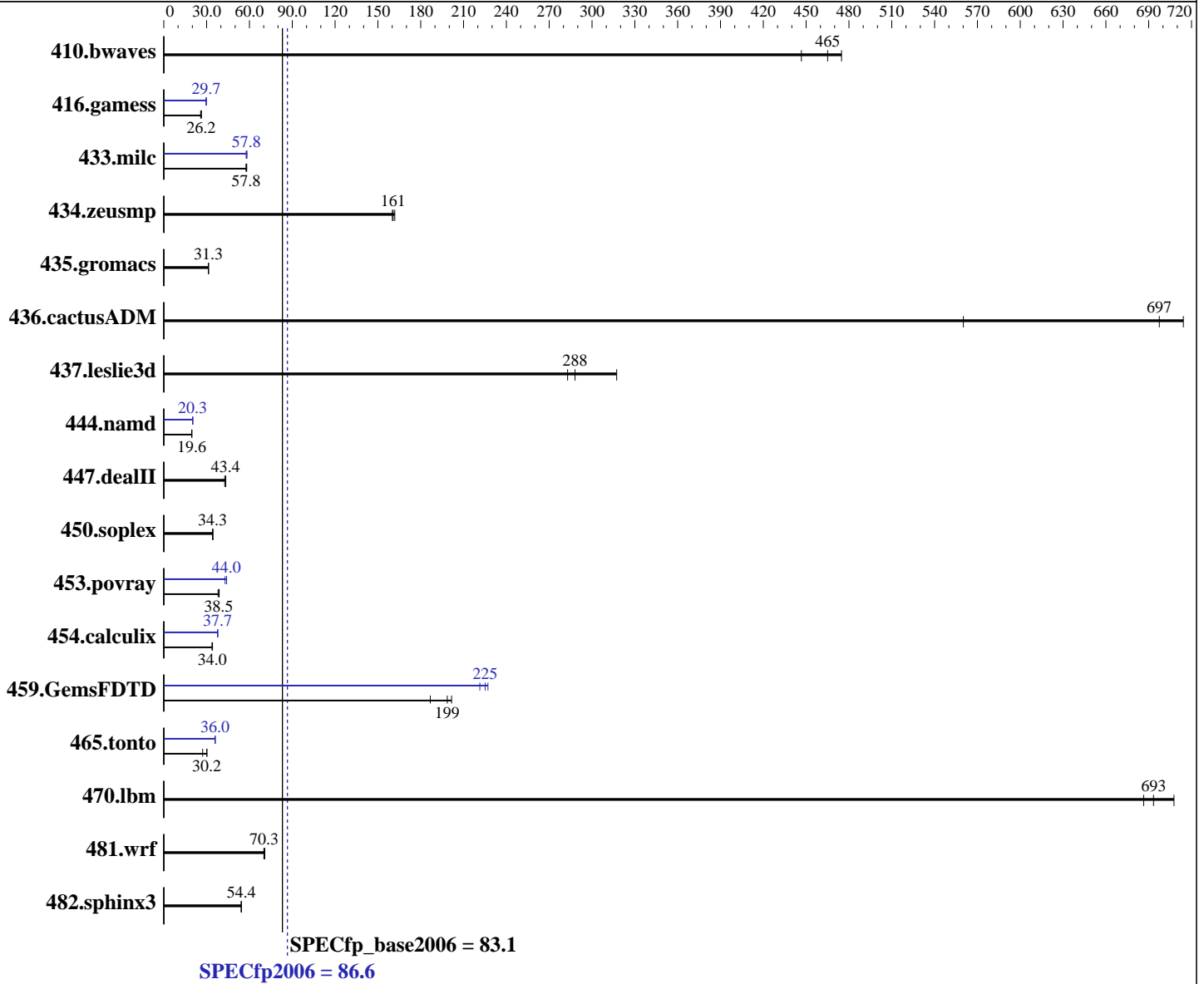
Test sponsor: Dell Inc.

Tested by: Dell Inc.

Test date: Sep-2014

Hardware Availability: Sep-2014

Software Availability: Sep-2014



Hardware

CPU Name: Intel Xeon E5-2650L v3
 CPU Characteristics: Intel Turbo Boost Technology up to 2.50 GHz
 CPU MHz: 1800
 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

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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
Other Cache: None
Memory: 256 GB (16 x 16 GB 2Rx4 PC4-2133P-R)
Disk Subsystem: 1 x 250 GB 7200 RPM SATA
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 | <u>29.2</u> | <u>465</u> | 28.6 | 475 | 30.4 | 447 | <u>29.2</u> | <u>465</u> | 28.6 | 475 | 30.4 | 447 |
| 416.gamess | 744 | 26.3 | <u>748</u> | <u>26.2</u> | 758 | 25.8 | <u>659</u> | <u>29.7</u> | 659 | 29.7 | 658 | 29.8 |
| 433.milc | <u>159</u> | <u>57.8</u> | 159 | 57.7 | 158 | 58.1 | 157 | 58.3 | <u>159</u> | <u>57.8</u> | 159 | 57.8 |
| 434.zeusmp | 56.8 | 160 | 56.2 | 162 | <u>56.6</u> | <u>161</u> | 56.8 | 160 | 56.2 | 162 | <u>56.6</u> | <u>161</u> |
| 435.gromacs | 229 | 31.2 | <u>228</u> | <u>31.3</u> | 228 | 31.3 | 229 | 31.2 | <u>228</u> | <u>31.3</u> | 228 | 31.3 |
| 436.cactusADM | <u>17.1</u> | <u>697</u> | 21.3 | 560 | 16.7 | 714 | <u>17.1</u> | <u>697</u> | 21.3 | 560 | 16.7 | 714 |
| 437.leslie3d | 29.6 | 317 | <u>32.6</u> | <u>288</u> | 33.2 | 283 | 29.6 | 317 | <u>32.6</u> | <u>288</u> | 33.2 | 283 |
| 444.namd | <u>409</u> | <u>19.6</u> | 409 | 19.6 | 409 | 19.6 | <u>396</u> | <u>20.3</u> | 396 | 20.3 | 396 | 20.3 |
| 447.dealII | 263 | 43.4 | 268 | 42.7 | <u>264</u> | <u>43.4</u> | 263 | 43.4 | 268 | 42.7 | <u>264</u> | <u>43.4</u> |
| 450.soplex | 244 | 34.2 | 242 | 34.4 | <u>243</u> | <u>34.3</u> | 244 | 34.2 | 242 | 34.4 | <u>243</u> | <u>34.3</u> |
| 453.povray | 137 | 38.8 | <u>138</u> | <u>38.5</u> | 140 | 38.0 | 121 | 44.0 | 124 | 42.9 | <u>121</u> | <u>44.0</u> |
| 454.calculix | 244 | 33.8 | 242 | 34.1 | <u>243</u> | <u>34.0</u> | 218 | 37.8 | 219 | 37.7 | <u>219</u> | <u>37.7</u> |
| 459.GemsFDTD | 56.8 | 187 | 52.6 | 202 | <u>53.4</u> | <u>199</u> | 47.9 | 221 | <u>47.1</u> | <u>225</u> | 46.7 | 227 |
| 465.tonto | <u>326</u> | <u>30.2</u> | 362 | 27.2 | 326 | 30.2 | 274 | 35.9 | <u>274</u> | <u>36.0</u> | 273 | 36.0 |
| 470.lbm | 20.0 | 686 | 19.4 | 708 | <u>19.8</u> | <u>693</u> | 20.0 | 686 | 19.4 | 708 | <u>19.8</u> | <u>693</u> |
| 481.wrf | 158 | 70.8 | 159 | 70.1 | <u>159</u> | <u>70.3</u> | 158 | 70.8 | 159 | 70.1 | <u>159</u> | <u>70.3</u> |
| 482.sphinx3 | <u>359</u> | <u>54.4</u> | 358 | 54.4 | 360 | 54.2 | <u>359</u> | <u>54.4</u> | 358 | 54.4 | 360 | 54.2 |

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

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 Fri Sep 5 18:28:03 2014

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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 E5-2650L v3 @ 1.80GHz
 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 5 11:16 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: basepeak = yes

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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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