



SPEC[®] CFP2006 Result

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Dell Inc.

PowerEdge M420 (Intel Xeon E5-2450 v2, 2.50 GHz)

SPECfp[®]2006 = 82.2

SPECfp_base2006 = 78.6

CPU2006 license: 55

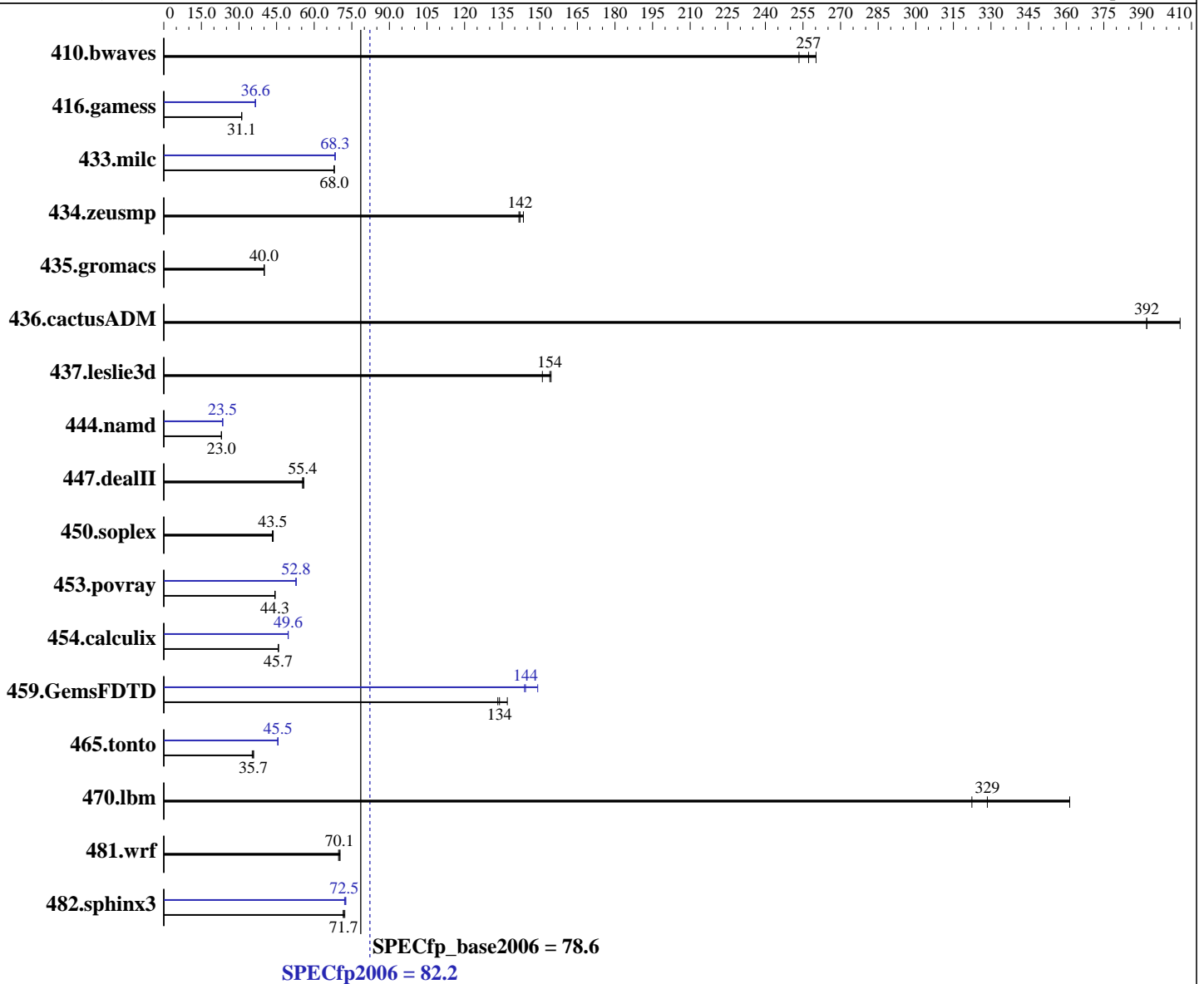
Test sponsor: Dell Inc.

Tested by: Dell Inc.

Test date: Nov-2013

Hardware Availability: Jan-2014

Software Availability: Sep-2013



Hardware

CPU Name: Intel Xeon E5-2450 v2
 CPU Characteristics: Intel Turbo Boost Technology up to 3.30 GHz
 CPU MHz: 2500
 FPU: Integrated
 CPU(s) enabled: 16 cores, 2 chips, 8 cores/chip
 CPU(s) orderable: 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) 3.0.70-0.9-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: ext2
 System State: Run level 3 (multi-user)

Continued on next page



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L3 Cache: 20 MB I+D on chip per chip
Other Cache: None
Memory: 96 GB (6 x 16 GB 2Rx4 PC3L-12800R-11, ECC)
Disk Subsystem: 2 x 50 GB SATA SSD, RAID 0
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	52.2	260	53.6	253	<u>52.8</u>	<u>257</u>	52.2	260	53.6	253	<u>52.8</u>	<u>257</u>
416.gamess	<u>630</u>	<u>31.1</u>	630	31.1	631	31.1	535	36.6	<u>535</u>	<u>36.6</u>	536	36.5
433.milc	135	68.0	135	68.0	<u>135</u>	<u>68.0</u>	<u>134</u>	<u>68.3</u>	134	68.4	134	68.3
434.zeusmp	63.4	143	64.2	142	<u>64.0</u>	<u>142</u>	63.4	143	64.2	142	<u>64.0</u>	<u>142</u>
435.gromacs	<u>178</u>	<u>40.0</u>	178	40.1	178	40.0	<u>178</u>	<u>40.0</u>	178	40.1	178	40.0
436.cactusADM	29.5	405	<u>30.5</u>	<u>392</u>	30.5	392	29.5	405	<u>30.5</u>	<u>392</u>	30.5	392
437.leslie3d	60.8	155	62.2	151	<u>61.0</u>	<u>154</u>	60.8	155	62.2	151	<u>61.0</u>	<u>154</u>
444.namd	<u>349</u>	<u>23.0</u>	349	23.0	349	23.0	<u>342</u>	<u>23.5</u>	342	23.5	342	23.5
447.dealII	<u>206</u>	<u>55.4</u>	205	55.9	207	55.4	<u>206</u>	<u>55.4</u>	205	55.9	207	55.4
450.soplex	<u>192</u>	<u>43.5</u>	191	43.7	193	43.3	<u>192</u>	<u>43.5</u>	191	43.7	193	43.3
453.povray	120	44.4	120	44.3	<u>120</u>	<u>44.3</u>	<u>101</u>	<u>52.8</u>	101	52.8	101	52.8
454.calculix	180	45.8	<u>181</u>	<u>45.7</u>	181	45.7	166	49.6	166	49.6	<u>166</u>	<u>49.6</u>
459.GemsFDTD	79.6	133	<u>79.2</u>	<u>134</u>	77.4	137	<u>73.5</u>	<u>144</u>	71.1	149	73.7	144
465.tonto	279	35.3	<u>275</u>	<u>35.7</u>	275	35.8	216	45.6	216	45.5	<u>216</u>	<u>45.5</u>
470.lbm	42.6	322	38.0	361	<u>41.8</u>	<u>329</u>	42.6	322	38.0	361	<u>41.8</u>	<u>329</u>
481.wrf	<u>159</u>	<u>70.1</u>	160	69.7	159	70.3	<u>159</u>	<u>70.1</u>	160	69.7	159	70.3
482.sphinx3	270	72.2	272	71.6	<u>272</u>	<u>71.7</u>	270	72.1	268	72.6	<u>269</u>	<u>72.5</u>

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:
Virtualization Technology disabled
Execute Disable disabled
Logical Processor 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 Thu Nov 21 16:16:28 2013

This section contains SUT (System Under Test) info as seen by
Continued on next page



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Platform Notes (Continued)

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 E5-2450 v2 @ 2.50GHz
 2 "physical id"s (chips)
 16 "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 : 8
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: 99123324 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 3.0.70-0.9-default #1 SMP Tue Apr 2 13:01:38 UTC 2013 (25ae5d2)
x86_64 x86_64 x86_64 GNU/Linux
```

run-level 3 Nov 21 10:24 last=S

SPEC is set to: /root/cpu2006-1.2

```
Filesystem Type Size Used Avail Use% Mounted on
/dev/sda2 ext2 83G 9.4G 73G 12% /
```

Additional information from dmidecode:

```
BIOS Dell Inc. 2.0.22 09/23/2013
Memory:
6x 00CE04B300CE M393B2G70BH0-YK0 16 GB 1600 MHz
```

(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 = "16"
```

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

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

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

Benchmarks using both Fortran and C:
-xAVX -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: -xAVX(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: -xAVX -ipo -O3 -no-prec-div -unroll2 -ansi-alias
-parallel

Continued on next page



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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.dealIII: 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: basepeak = yes

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-

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-ic14.0-official-linux64.20140128.html>

<http://www.spec.org/cpu2006/flags/Dell-Platform-Settings-V1.2-revB.html>

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

<http://www.spec.org/cpu2006/flags/Intel-ic14.0-official-linux64.20140128.xml>

<http://www.spec.org/cpu2006/flags/Dell-Platform-Settings-V1.2-revB.xml>

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Page 6



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