



SPEC[®] CFP2006 Result

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Dell Inc.

SPECfp[®]2006 = 83.8

PowerEdge R920 (Intel Xeon E7-2870 v2, 2.30 GHz)

SPECfp_base2006 = 80.1

CPU2006 license: 55

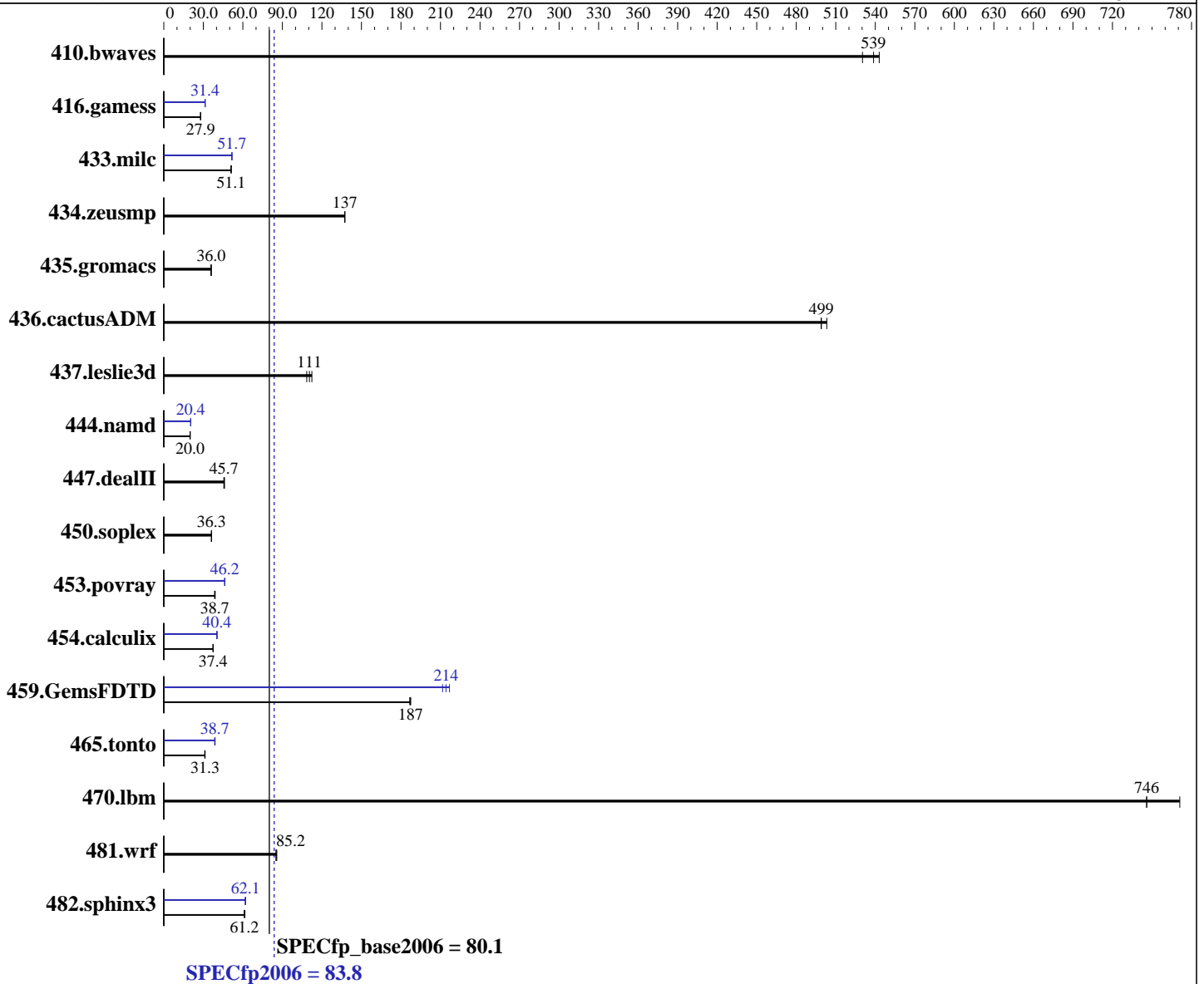
Test date: Apr-2014

Test sponsor: Dell Inc.

Hardware Availability: Mar-2014

Tested by: Dell Inc.

Software Availability: Aug-2013



Hardware

CPU Name: Intel Xeon E7-2870 v2
 CPU Characteristics: Intel Turbo Boost Technology up to 2.90 GHz
 CPU MHz: 2300
 FPU: Integrated
 CPU(s) enabled: 30 cores, 2 chips, 15 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 (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: ext2
 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 (32 x 8 GB 2Rx4 PC3L-12800R-11, ECC)
Disk Subsystem: 1 x 300 GB 15000 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	<u>25.2</u>	<u>539</u>	25.6	530	25.0	543	<u>25.2</u>	<u>539</u>	25.6	530	25.0	543
416.gamess	702	27.9	701	27.9	<u>701</u>	<u>27.9</u>	624	31.4	625	31.3	<u>624</u>	<u>31.4</u>
433.milc	<u>180</u>	<u>51.1</u>	179	51.1	180	51.1	178	51.6	<u>178</u>	<u>51.7</u>	177	51.8
434.zeusmp	<u>66.2</u>	<u>137</u>	66.2	137	66.2	137	<u>66.2</u>	<u>137</u>	66.2	137	66.2	137
435.gromacs	198	36.0	200	35.8	<u>199</u>	<u>36.0</u>	198	36.0	200	35.8	<u>199</u>	<u>36.0</u>
436.cactusADM	<u>23.9</u>	<u>499</u>	23.9	499	23.7	503	<u>23.9</u>	<u>499</u>	23.9	499	23.7	503
437.leslie3d	<u>85.0</u>	<u>111</u>	86.6	108	83.6	112	<u>85.0</u>	<u>111</u>	86.6	108	83.6	112
444.namd	402	20.0	<u>401</u>	<u>20.0</u>	401	20.0	<u>393</u>	<u>20.4</u>	393	20.4	393	20.4
447.dealII	248	46.1	251	45.6	<u>250</u>	<u>45.7</u>	248	46.1	251	45.6	<u>250</u>	<u>45.7</u>
450.soplex	230	36.3	231	36.0	<u>230</u>	<u>36.3</u>	230	36.3	231	36.0	<u>230</u>	<u>36.3</u>
453.povray	138	38.6	<u>137</u>	<u>38.7</u>	136	39.0	115	46.4	115	46.2	<u>115</u>	<u>46.2</u>
454.calculix	221	37.4	221	37.4	<u>221</u>	<u>37.4</u>	205	40.3	<u>204</u>	<u>40.4</u>	204	40.4
459.GemsFDTD	<u>56.7</u>	<u>187</u>	56.6	187	56.8	187	50.1	212	48.9	217	<u>49.5</u>	<u>214</u>
465.tonto	<u>315</u>	<u>31.3</u>	317	31.0	314	31.3	<u>254</u>	<u>38.7</u>	255	38.6	253	39.0
470.lbm	18.4	746	<u>18.4</u>	<u>746</u>	17.8	771	18.4	746	<u>18.4</u>	<u>746</u>	17.8	771
481.wrf	<u>131</u>	<u>85.2</u>	130	85.8	131	85.2	<u>131</u>	<u>85.2</u>	130	85.8	131	85.2
482.sphinx3	<u>319</u>	<u>61.2</u>	317	61.6	319	61.1	314	62.1	<u>314</u>	<u>62.1</u>	316	61.7

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
System Profile set to Custom
ClE set to enabled
C States set to enabled
Sysinfo program /root/CPU2006-1.2/config/sysinfo.rev6818
\$Rev: 6818 \$ \$Date:: 2012-07-17 #\$ e86d102572650a6e4d596a3cee98f191
running on R920-SL11SP3 Mon Apr 21 16:18:08 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 E7-2870 v2 @ 2.30GHz
 2 "physical id"s (chips)
 60 "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 : 15
  siblings  : 30
  physical 0: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14
  physical 1: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14
cache size : 30720 KB

```

```

From /proc/meminfo
MemTotal:      264594020 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 R920-SL11SP3 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 Apr 21 16:13 last=S

```

SPEC is set to: /root/CPU2006-1.2
Filesystem      Type  Size  Used Avail Use% Mounted on
/dev/sda1       ext2  266G  14G  252G   6% /

```

```

Additional information from dmidecode:
BIOS Dell Inc. 1.1.0 03/07/2014
Memory:
 29x 00CE00B300CE M393B1G73QH0-YK0 8 GB 1333 MHz
 3x 00CE04B300CE M393B1G73QH0-YK0 8 GB 1333 MHz

```

(End of data from sysinfo program)



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General Notes

Environment variables set by runspec before the start of the run:

KMP_AFFINITY = "granularity=fine,compact,1,0"

LD_LIBRARY_PATH = "/root/CPU2006-1.2/libs/32:/root/CPU2006-1.2/libs/64:/root/CPU2006-1.2/sh"

OMP_NUM_THREADS = "30"

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

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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-revC.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-revC.xml>



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