



SPEC[®] CFP2006 Result

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Dell Inc.

PowerEdge R820 (Intel Xeon E5-4620 v2,
2.60 GHz)

SPECfp[®]2006 = 83.3

SPECfp_base2006 = 80.6

CPU2006 license: 55

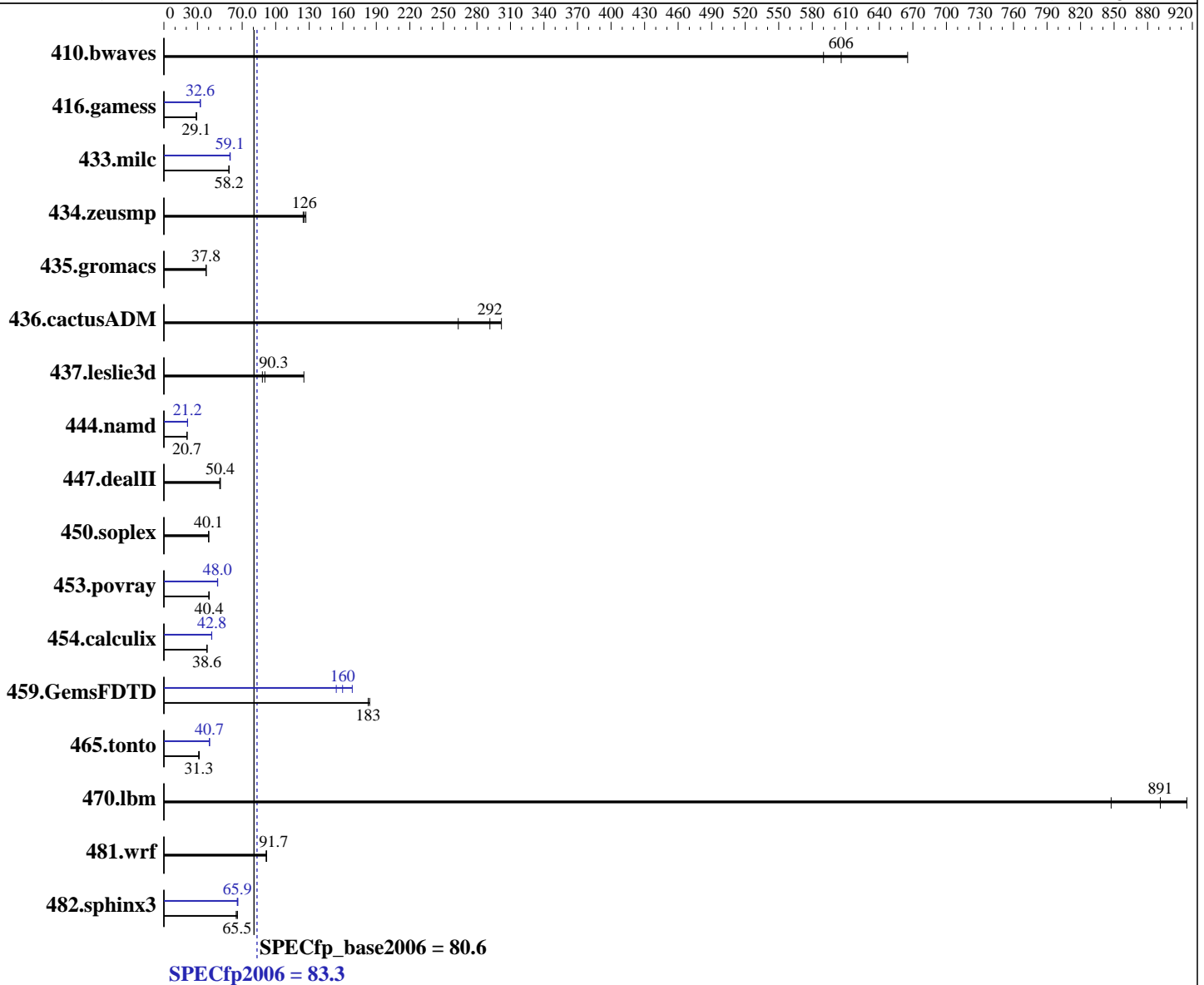
Test sponsor: Dell Inc.

Tested by: Dell Inc.

Test date: Mar-2014

Hardware Availability: Mar-2014

Software Availability: Aug-2013



Hardware

CPU Name: Intel Xeon E5-4620 v2
 CPU Characteristics: Intel Turbo Boost Technology up to 3.00 GHz
 CPU MHz: 2600
 FPU: Integrated
 CPU(s) enabled: 32 cores, 4 chips, 8 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: 20 MB I+D on chip per chip
Other Cache: None
Memory: 512 GB (32 x 16 GB 2Rx4 PC3-14900R-13, ECC)
Disk Subsystem: 1 x 160 GB SATA SSD
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	23.0	590	<u>22.4</u>	<u>606</u>	20.4	665	23.0	590	<u>22.4</u>	<u>606</u>	20.4	665
416.gamess	673	29.1	674	29.0	<u>674</u>	<u>29.1</u>	603	32.5	<u>601</u>	<u>32.6</u>	601	32.6
433.milc	158	58.2	158	58.2	<u>158</u>	<u>58.2</u>	155	59.4	155	59.1	<u>155</u>	<u>59.1</u>
434.zeusmp	<u>72.5</u>	<u>126</u>	71.7	127	73.1	125	<u>72.5</u>	<u>126</u>	71.7	127	73.1	125
435.gromacs	189	37.8	<u>189</u>	<u>37.8</u>	189	37.7	189	37.8	<u>189</u>	<u>37.8</u>	189	37.7
436.cactusADM	39.6	302	45.4	263	<u>41.0</u>	<u>292</u>	39.6	302	45.4	263	<u>41.0</u>	<u>292</u>
437.leslie3d	75.1	125	107	88.1	<u>104</u>	<u>90.3</u>	75.1	125	107	88.1	<u>104</u>	<u>90.3</u>
444.namd	388	20.7	<u>388</u>	<u>20.7</u>	388	20.7	379	21.2	<u>379</u>	<u>21.2</u>	379	21.1
447.dealII	229	50.0	<u>227</u>	<u>50.4</u>	227	50.5	229	50.0	<u>227</u>	<u>50.4</u>	227	50.5
450.soplex	209	40.0	<u>208</u>	<u>40.1</u>	208	40.1	209	40.0	<u>208</u>	<u>40.1</u>	208	40.1
453.povray	132	40.2	<u>132</u>	<u>40.4</u>	131	40.6	111	48.0	110	48.2	<u>111</u>	<u>48.0</u>
454.calculix	<u>214</u>	<u>38.6</u>	214	38.6	215	38.4	193	42.7	193	42.8	<u>193</u>	<u>42.8</u>
459.GemsFDTD	58.0	183	57.6	184	<u>58.0</u>	<u>183</u>	63.0	168	<u>66.4</u>	<u>160</u>	68.8	154
465.tonto	<u>315</u>	<u>31.3</u>	316	31.2	311	31.6	241	40.9	242	40.6	<u>242</u>	<u>40.7</u>
470.lbm	15.0	915	<u>15.4</u>	<u>891</u>	16.2	847	15.0	915	<u>15.4</u>	<u>891</u>	16.2	847
481.wrf	122	91.5	<u>122</u>	<u>91.7</u>	122	91.8	122	91.5	<u>122</u>	<u>91.7</u>	122	91.8
482.sphinx3	<u>298</u>	<u>65.5</u>	302	64.6	296	65.8	297	65.6	294	66.2	<u>296</u>	<u>65.9</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
System Profile set to Custom
ClE enabled
C States enabled
Sysinfo program /root/cpu2006-1.2/config/sysinfo.rev6818
\$Rev: 6818 \$ \$Date:: 2012-07-17 #\$ e86d102572650a6e4d596a3cee98f191
running on linux Wed Mar 26 11:52:15 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 E5-4620 v2 @ 2.60GHz
 4 "physical id"s (chips)
64 "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
  physical 2: cores 0 1 2 3 4 5 6 7
  physical 3: cores 0 1 2 3 4 5 6 7
cache size     : 20480 KB

```

```

From /proc/meminfo
MemTotal:      529392212 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 Mar 26 11:48 last=S

```

SPEC is set to: /root/cpu2006-1.2
Filesystem      Type  Size  Used Avail Use% Mounted on
/dev/sda2       ext2  139G   20G  118G  15% /

```

```

Additional information from dmidecode:
BIOS Dell Inc. 2.0.20 01/16/2014
Memory:
32x 00AD00B300AD HMT42GR7AFR4C-RD 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:

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 = "32"

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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