



# SPEC<sup>®</sup> CFP2006 Result

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## Dell Inc.

PowerEdge R730 (Intel Xeon E5-2640 v3,  
2.60 GHz)

SPECfp<sup>®</sup>2006 = 104

SPECfp\_base2006 = 98.1

CPU2006 license: 55

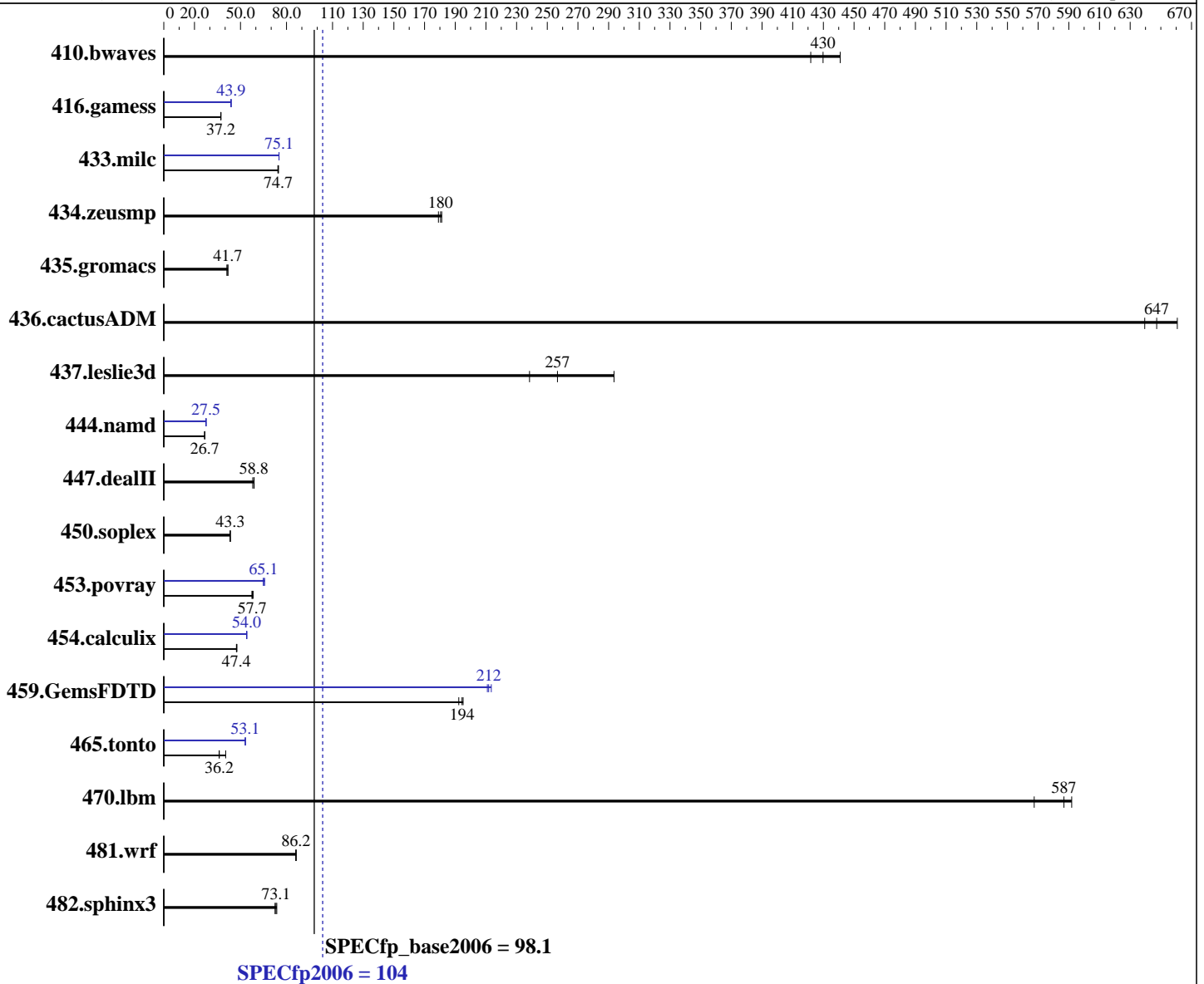
Test sponsor: Dell Inc.

Tested by: Dell Inc.

Test date: Aug-2014

Hardware Availability: Sep-2014

Software Availability: Sep-2014



**Hardware**

CPU Name: Intel Xeon E5-2640 v3  
 CPU Characteristics: Intel Turbo Boost Technology up to 3.40 GHz  
 CPU MHz: 2600  
 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

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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: 20 MB I+D on chip per chip  
Other Cache: None  
Memory: 192 GB (8 x 16 GB, 8 x 8 GB 2Rx4 PC4-2133P-R, running at 1866 MHz)  
Disk Subsystem: 1 x 1000 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	<b>31.6</b>	<b>430</b>	30.8	441	32.2	422	<b>31.6</b>	<b>430</b>	30.8	441	32.2	422
416.gamess	527	37.2	<b>527</b>	<b>37.2</b>	526	37.3	<b>446</b>	<b>43.9</b>	445	44.0	448	43.7
433.milc	123	74.4	<b>123</b>	<b>74.7</b>	123	74.7	<b>122</b>	<b>75.1</b>	122	75.1	122	75.1
434.zeusmp	50.2	181	50.8	179	<b>50.4</b>	<b>180</b>	50.2	181	50.8	179	<b>50.4</b>	<b>180</b>
435.gromacs	<b>171</b>	<b>41.7</b>	171	41.8	174	41.1	<b>171</b>	<b>41.7</b>	171	41.8	174	41.1
436.cactusADM	18.1	661	<b>18.5</b>	<b>647</b>	18.7	640	18.1	661	<b>18.5</b>	<b>647</b>	18.7	640
437.leslie3d	<b>36.6</b>	<b>257</b>	39.4	238	32.0	294	<b>36.6</b>	<b>257</b>	39.4	238	32.0	294
444.namd	301	26.7	301	26.7	<b>301</b>	<b>26.7</b>	<b>291</b>	<b>27.5</b>	291	27.6	291	27.5
447.dealII	194	58.9	<b>195</b>	<b>58.8</b>	197	58.0	194	58.9	<b>195</b>	<b>58.8</b>	197	58.0
450.soplex	193	43.3	192	43.3	<b>193</b>	<b>43.3</b>	193	43.3	192	43.3	<b>193</b>	<b>43.3</b>
453.povray	91.4	58.2	92.6	57.5	<b>92.3</b>	<b>57.7</b>	82.0	64.9	<b>81.7</b>	<b>65.1</b>	80.9	65.7
454.calculix	174	47.4	<b>174</b>	<b>47.4</b>	173	47.7	153	54.0	152	54.2	<b>153</b>	<b>54.0</b>
459.GemsFDTD	<b>54.6</b>	<b>194</b>	55.2	192	54.4	195	50.3	211	<b>50.1</b>	<b>212</b>	49.7	214
465.tonto	244	40.3	<b>272</b>	<b>36.2</b>	273	36.1	185	53.1	<b>185</b>	<b>53.1</b>	185	53.2
470.lbm	24.2	567	23.2	592	<b>23.4</b>	<b>587</b>	24.2	567	23.2	592	<b>23.4</b>	<b>587</b>
481.wrf	130	86.1	<b>130</b>	<b>86.2</b>	129	86.3	130	86.1	<b>130</b>	<b>86.2</b>	129	86.3
482.sphinx3	265	73.7	269	72.5	<b>267</b>	<b>73.1</b>	265	73.7	269	72.5	<b>267</b>	<b>73.1</b>

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-khqw Tue Aug 26 20:16:20 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 E5-2640 v3 @ 2.60GHz
 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:      198249728 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-khqw 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 Aug 26 14:33 last=S

```

SPEC is set to: /root/cpu2006-1.2
Filesystem      Type  Size  Used Avail Use% Mounted on
/dev/sda2       ext3  915G  9.8G  905G   2% /

```

Additional information from dmidecode:

```

BIOS Dell Inc. 1.0.3 08/21/2014
Memory:
1x 00AD00B300AD HMA42GR7MFR4N-TFTD 16 GB 1867 MHz
5x 00AD063200AD HMA42GR7MFR4N-TFT1 16 GB 1867 MHz
8x 00CE00B300CE M393A1G43DB0-CPB 8 GB 1867 MHz
2x 00CE00B300CE M393A2G40DB0-CPB 16 GB 1867 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 = "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:

-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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