



# SPEC<sup>®</sup> CFP2006 Result

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## Dell Inc.

SPECfp<sup>®</sup>2006 = **123**

PowerEdge R930 (Intel Xeon E7-8891 v3, 2.80 GHz)

SPECfp\_base2006 = **117**

CPU2006 license: 55

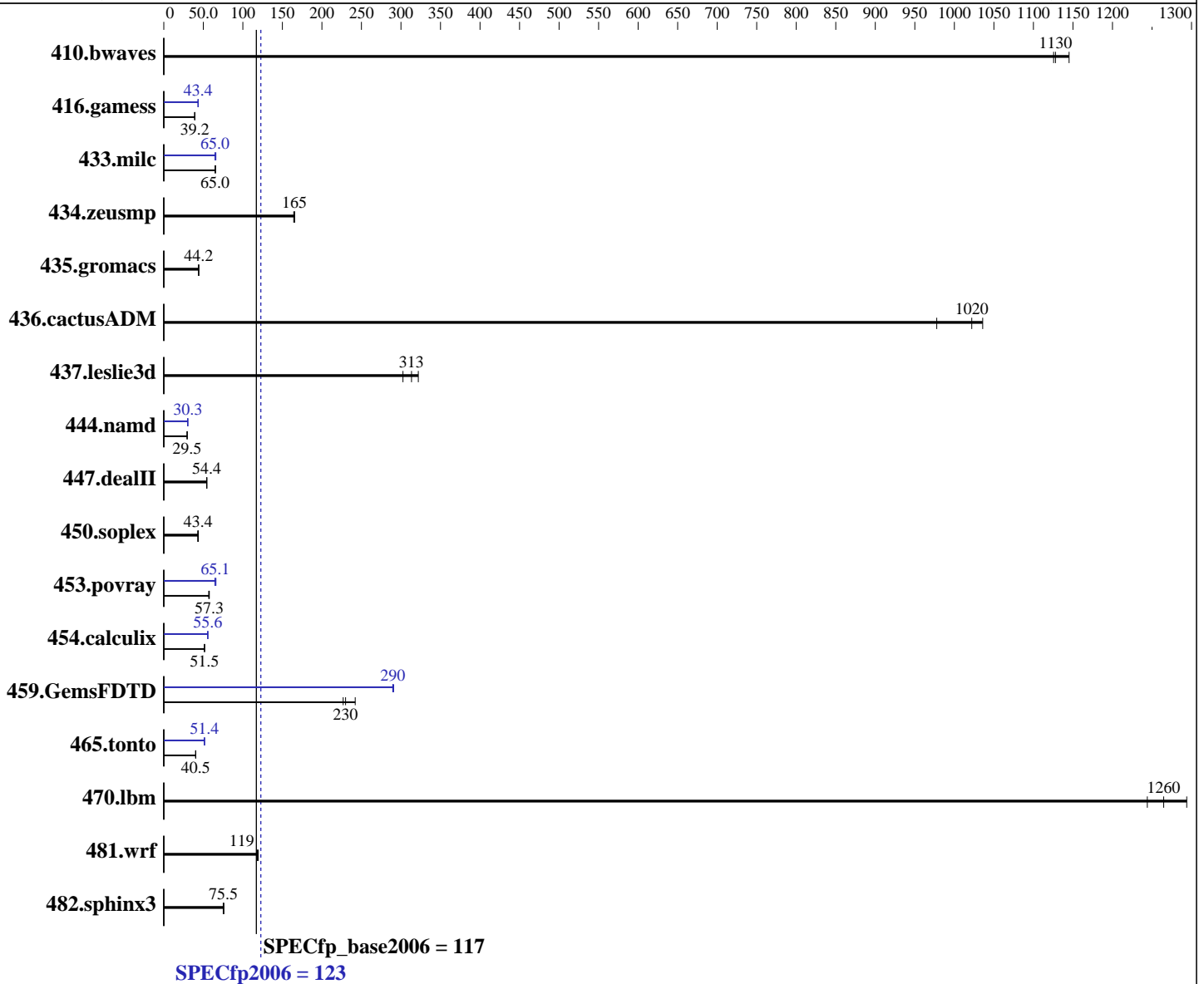
Test date: Apr-2015

Test sponsor: Dell Inc.

Hardware Availability: Jun-2015

Tested by: Dell Inc.

Software Availability: Mar-2015



### Hardware

CPU Name: Intel Xeon E7-8891 v3  
 CPU Characteristics: Intel Turbo Boost Technology up to 3.50 GHz  
 CPU MHz: 2800  
 FPU: Integrated  
 CPU(s) enabled: 40 cores, 4 chips, 10 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: Red Hat Enterprise Linux Server release 7.1 (Maipo)  
 3.10.0-229.el7.x86\_64  
 Compiler: C/C++: Version 15.0.0.090 of Intel C++ Studio XE for Linux;  
 Fortran: Version 15.0.0.090 of Intel Fortran Studio XE for Linux  
 Auto Parallel: Yes  
 File System: ext4

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L3 Cache: 45 MB I+D on chip per chip  
 Other Cache: None  
 Memory: 512 GB (32 x 16 GB 2Rx4 PC4-2133P-R, running at 1600 MHz)  
 Disk Subsystem: 1 x 200 GB SATA SSD  
 Other Hardware: None

System State: Run level 3 (multi-user)  
 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	11.9	1150	12.1	1130	<b><u>12.0</u></b>	<b><u>1130</u></b>	11.9	1150	12.1	1130	<b><u>12.0</u></b>	<b><u>1130</u></b>
416.gamess	499	39.2	<b><u>500</u></b>	<b><u>39.2</u></b>	501	39.1	452	43.4	<b><u>451</u></b>	<b><u>43.4</u></b>	451	43.4
433.milc	140	65.4	141	65.0	<b><u>141</u></b>	<b><u>65.0</u></b>	139	65.9	141	64.9	<b><u>141</u></b>	<b><u>65.0</u></b>
434.zeusmp	<b><u>55.0</u></b>	<b><u>165</u></b>	55.0	165	55.4	164	<b><u>55.0</u></b>	<b><u>165</u></b>	55.0	165	55.4	164
435.gromacs	163	43.9	<b><u>162</u></b>	<b><u>44.2</u></b>	161	44.3	163	43.9	<b><u>162</u></b>	<b><u>44.2</u></b>	161	44.3
436.cactusADM	12.2	978	11.5	1040	<b><u>11.7</u></b>	<b><u>1020</u></b>	12.2	978	11.5	1040	<b><u>11.7</u></b>	<b><u>1020</u></b>
437.leslie3d	31.1	303	<b><u>30.0</u></b>	<b><u>313</u></b>	29.2	322	31.1	303	<b><u>30.0</u></b>	<b><u>313</u></b>	29.2	322
444.namd	<b><u>272</u></b>	<b><u>29.5</u></b>	271	29.5	272	29.5	<b><u>264</u></b>	<b><u>30.3</u></b>	264	30.4	264	30.3
447.dealII	<b><u>210</u></b>	<b><u>54.4</u></b>	210	54.5	211	54.1	<b><u>210</u></b>	<b><u>54.4</u></b>	210	54.5	211	54.1
450.soplex	191	43.7	<b><u>192</u></b>	<b><u>43.4</u></b>	194	42.9	191	43.7	<b><u>192</u></b>	<b><u>43.4</u></b>	194	42.9
453.povray	<b><u>92.8</u></b>	<b><u>57.3</u></b>	92.4	57.6	93.7	56.8	<b><u>81.7</u></b>	<b><u>65.1</u></b>	80.6	66.0	82.2	64.7
454.calculix	160	51.5	<b><u>160</u></b>	<b><u>51.5</u></b>	160	51.6	<b><u>148</u></b>	<b><u>55.6</u></b>	148	55.7	148	55.6
459.GemsFDTD	46.8	227	43.8	242	<b><u>46.1</u></b>	<b><u>230</u></b>	<b><u>36.6</u></b>	<b><u>290</u></b>	36.6	290	36.5	291
465.tonto	245	40.1	243	40.5	<b><u>243</u></b>	<b><u>40.5</u></b>	<b><u>191</u></b>	<b><u>51.4</u></b>	191	51.6	192	51.3
470.lbm	<b><u>10.9</u></b>	<b><u>1260</u></b>	10.6	1290	11.0	1240	<b><u>10.9</u></b>	<b><u>1260</u></b>	10.6	1290	11.0	1240
481.wrf	94.7	118	93.6	119	<b><u>94.3</u></b>	<b><u>119</u></b>	94.7	118	93.6	119	<b><u>94.3</u></b>	<b><u>119</u></b>
482.sphinx3	259	75.2	256	76.1	<b><u>258</u></b>	<b><u>75.5</u></b>	259	75.2	256	76.1	<b><u>258</u></b>	<b><u>75.5</u></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:  
 Virtualization Technology disabled  
 System Profile set to Custom  
 CPU Power Management set to Maximum Performance  
 Memory Frequency set to Maximum Performance  
 Turbo Boost enabled  
 Energy Efficient Turbo disabled  
 C1E disabled  
 C States disabled

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## Platform Notes (Continued)

Collaborative CPU Performance Control disabled  
Memory Patrol Scrub disabled  
Memory Refresh Rate set to 1x  
Uncore Frequency set to Maximum  
Energy Efficient Policy set to Performance  
Monitor/MWait enabled

Sysinfo program

```
/root/Desktop/Performance/ic15.0_Aug29_2014/config/sysinfo.rev6914
$Rev: 6914 $ $Date:: 2014-06-25 #$ e3fbb8667b5a285932ceab81e28219e1
running on localhost.localdomain Fri Apr 3 21:32:02 2015
```

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 E7-8891 v3 @ 2.80GHz
 4 "physical id"s (chips)
 80 "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 : 10
siblings : 20
physical 0: cores 0 1 2 4 6 8 17 19 20 23
physical 1: cores 0 1 2 4 6 8 17 19 20 23
physical 2: cores 0 1 2 4 6 8 17 19 20 23
physical 3: cores 0 1 2 4 6 8 17 19 20 23
cache size : 46080 KB
```

From /proc/meminfo

```
MemTotal: 528089244 kB
HugePages_Total: 0
Hugepagesize: 2048 kB
```

From /etc/\*release\* /etc/\*version\*

```
os-release:
NAME="Red Hat Enterprise Linux Server"
VERSION="7.1 (Maipo)"
ID="rhel"
ID_LIKE="fedora"
VERSION_ID="7.1"
PRETTY_NAME="Red Hat Enterprise Linux Server 7.1 (Maipo)"
ANSI_COLOR="0;31"
CPE_NAME="cpe:/o:redhat:enterprise_linux:7.1:GA:server"
redhat-release: Red Hat Enterprise Linux Server release 7.1 (Maipo)
system-release: Red Hat Enterprise Linux Server release 7.1 (Maipo)
system-release-cpe: cpe:/o:redhat:enterprise_linux:7.1:ga:server
```

uname -a:

```
Linux localhost.localdomain 3.10.0-229.el7.x86_64 #1 SMP Thu Jan 29 18:37:38
```

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## Platform Notes (Continued)

EST 2015 x86\_64 x86\_64 x86\_64 GNU/Linux

run-level 3 Apr 3 16:52 last=5

SPEC is set to: /root/Desktop/Performance/ic15.0\_Aug29\_2014

Filesystem	Type	Size	Used	Avail	Use%	Mounted on
/dev/sdb2	ext4	183G	9.9G	164G	6%	/

Additional information from dmidecode:

Warning: Use caution when you interpret this section. The 'dmidecode' program reads system data which is "intended to allow hardware to be accurately determined", but the intent may not be met, as there are frequent changes to hardware, firmware, and the "DMTF SMBIOS" standard.

BIOS Dell Inc. 1.0.1 [MRC\_096] 03/27/2015

Memory:

32x 00AD00B300AD Not Specified 16 GB 2 rank 2133 MHz, configured at 1600 MHz  
64x Not Specified Not Specified

(End of data from sysinfo program)

## General Notes

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

KMP\_AFFINITY = "granularity=fine,compact,1,0"

LD\_LIBRARY\_PATH = \*/root/Desktop/Performance/ic15.0\_Aug29\_2014/libs/32:/root/Desktop/Performance/ic15.0\_Aug29\_2014/libs/64:/root/Desktop/Performance/ic15.0\_Aug29\_2014/sh\*

OMP\_NUM\_THREADS = "40"

Binaries compiled on a system with 1x Core i5-4670K CPU + 16GB memory using RedHat EL 7.0

Transparent Huge Pages enabled with:

echo always > /sys/kernel/mm/transparent\_hugepage/enabled

## 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



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## 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

```

## 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

```

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## Peak Compiler Invocation (Continued)

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

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

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## Peak Optimization Flags (Continued)

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-ic15.0-official-linux64.html>

<http://www.spec.org/cpu2006/flags/Dell-Platform-Settings-V1.2-revE.20150421.html>

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

<http://www.spec.org/cpu2006/flags/Intel-ic15.0-official-linux64.xml>

<http://www.spec.org/cpu2006/flags/Dell-Platform-Settings-V1.2-revE.20150421.xml>

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For other inquiries, please contact [webmaster@spec.org](mailto:webmaster@spec.org).

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