



SPEC[®] CFP2006 Result

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Dell Inc.

SPECfp[®]2006 = **124**

PowerEdge T630 (Intel Xeon E5-2687W v4, 3.00 GHz)

SPECfp_base2006 = **118**

CPU2006 license: 55

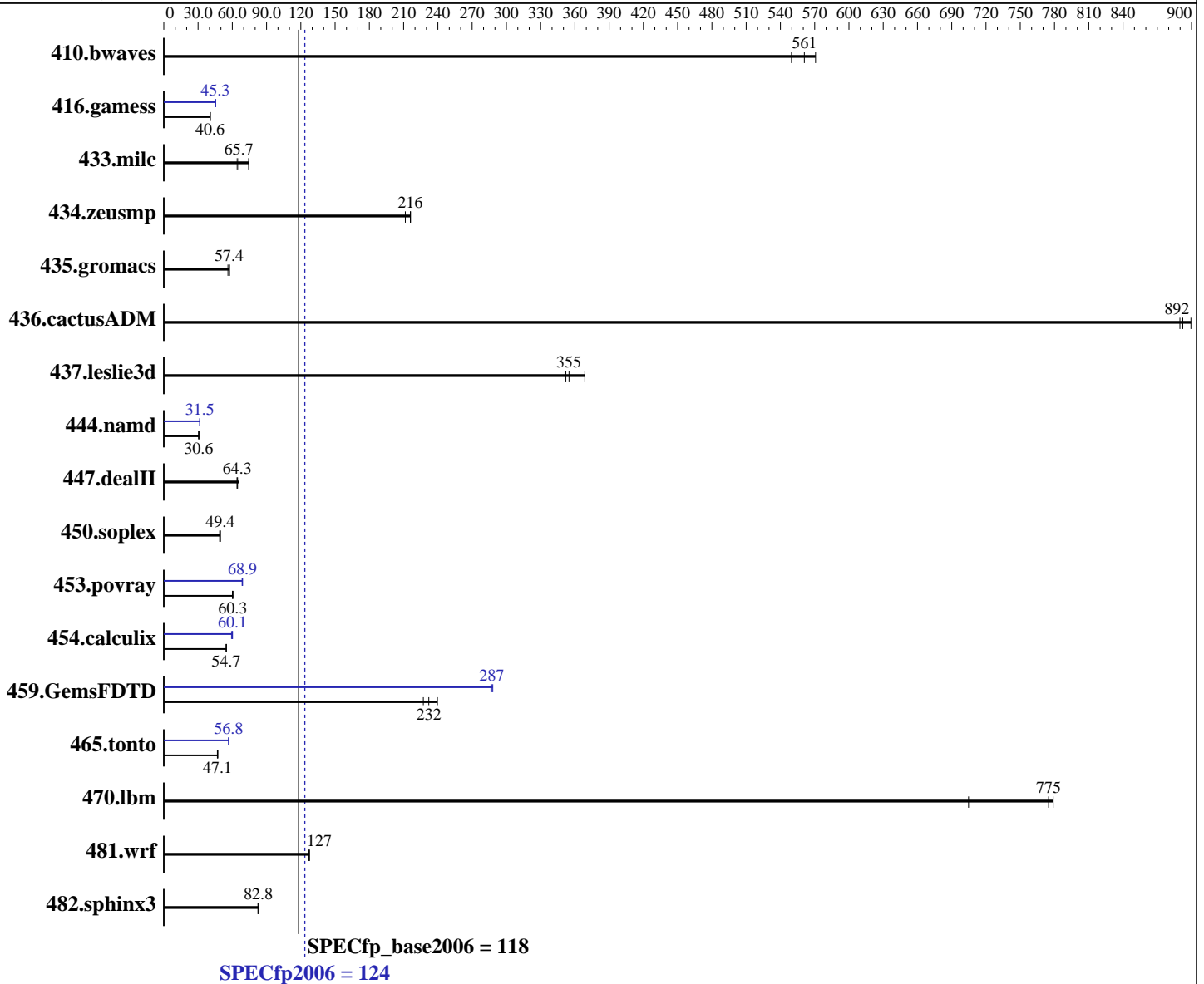
Test date: Jun-2016

Test sponsor: Dell Inc.

Hardware Availability: Jun-2016

Tested by: Dell Inc.

Software Availability: Mar-2016



Hardware		Software	
CPU Name:	Intel Xeon E5-2687W v4	Operating System:	Red Hat Enterprise Linux Server release 7.2 (Maipo)
CPU Characteristics:	Intel Turbo Boost Technology up to 3.50 GHz		3.10.0-327.el7.x86_64
CPU MHz:	3000	Compiler:	C/C++: Version 16.0.0.101 of Intel C++ Studio XE for Linux;
FPU:	Integrated		Fortran: Version 16.0.0.101 of Intel Fortran Studio XE for Linux
CPU(s) enabled:	24 cores, 2 chips, 12 cores/chip, 2 threads/core	Auto Parallel:	Yes
CPU(s) orderable:	1,2 chips	File System:	xfs
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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L3 Cache: 30 MB I+D on chip per chip
 Other Cache: None
 Memory: 512 GB (16 x 32 GB 2Rx8 PC4-2400T-R)
 Disk Subsystem: 1 x 400 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	24.7	550	23.8	571	<u>24.2</u>	<u>561</u>	24.7	550	23.8	571	<u>24.2</u>	<u>561</u>
416.gamess	482	40.7	483	40.5	<u>482</u>	<u>40.6</u>	433	45.2	432	45.3	<u>433</u>	<u>45.3</u>
433.milc	<u>140</u>	<u>65.7</u>	124	74.3	143	64.2	<u>140</u>	<u>65.7</u>	124	74.3	143	64.2
434.zeusmp	<u>42.1</u>	<u>216</u>	42.1	216	43.0	212	<u>42.1</u>	<u>216</u>	42.1	216	43.0	212
435.gromacs	127	56.2	<u>124</u>	<u>57.4</u>	124	57.4	127	56.2	<u>124</u>	<u>57.4</u>	124	57.4
436.cactusADM	<u>13.4</u>	<u>892</u>	13.4	890	13.3	899	<u>13.4</u>	<u>892</u>	13.4	890	13.3	899
437.leslie3d	26.7	352	25.5	369	<u>26.5</u>	<u>355</u>	26.7	352	25.5	369	<u>26.5</u>	<u>355</u>
444.namd	<u>262</u>	<u>30.6</u>	261	30.7	262	30.6	254	31.5	<u>254</u>	<u>31.5</u>	254	31.5
447.dealII	<u>178</u>	<u>64.3</u>	174	65.7	178	64.2	<u>178</u>	<u>64.3</u>	174	65.7	178	64.2
450.soplex	<u>169</u>	<u>49.4</u>	169	49.5	171	48.9	<u>169</u>	<u>49.4</u>	169	49.5	171	48.9
453.povray	<u>88.2</u>	<u>60.3</u>	88.5	60.1	87.8	60.6	<u>77.2</u>	<u>68.9</u>	77.2	68.9	77.6	68.6
454.calculix	<u>151</u>	<u>54.7</u>	151	54.8	151	54.6	137	60.2	<u>137</u>	<u>60.1</u>	139	59.3
459.GemsFDTD	44.3	240	46.7	227	<u>45.7</u>	<u>232</u>	36.8	288	<u>36.9</u>	<u>287</u>	37.0	286
465.tonto	210	46.9	<u>209</u>	<u>47.1</u>	208	47.3	173	56.9	173	56.8	<u>173</u>	<u>56.8</u>
470.lbm	<u>17.7</u>	<u>775</u>	19.5	705	17.6	779	<u>17.7</u>	<u>775</u>	19.5	705	17.6	779
481.wrf	87.6	127	87.8	127	<u>87.7</u>	<u>127</u>	87.6	127	87.8	127	<u>87.7</u>	<u>127</u>
482.sphinx3	<u>235</u>	<u>82.8</u>	236	82.4	234	83.3	<u>235</u>	<u>82.8</u>	236	82.4	234	83.3

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
 System Profile set to custom
 CPU Performance set to Maximum Performance
 C States set to Autonomous
 C1E enabled
 Energy Efficient Turbo disabled
 Uncore Frequency set to Dynamic
 Energy Efficiency Policy set to Performance

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Platform Notes (Continued)

Memory Patrol Scrub disabled
Sysinfo program /root/cpu2006-1.2/config/sysinfo.rev6914
\$Rev: 6914 \$ \$Date:: 2014-06-25 # \$ e3fbb8667b5a285932ceab81e28219e1
running on localhost.localdomain Wed Jun 29 14:12:46 2016

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 E5-2687W v4@ 3.00GHz
 2 "physical id"s (chips)
 48 "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 : 12
  siblings  : 24
  physical 0: cores 0 1 2 3 4 5 8 9 10 11 12 13
  physical 1: cores 0 1 2 3 4 5 8 9 10 11 12 13
cache size : 30720 KB
```

```
From /proc/meminfo
MemTotal:      528280404 kB
HugePages_Total:      0
Hugepagesize:    2048 kB
```

```
From /etc/*release* /etc/*version*
os-release:
NAME="Red Hat Enterprise Linux Server"
VERSION="7.2 (Maipo)"
ID="rhel"
ID_LIKE="fedora"
VERSION_ID="7.2"
PRETTY_NAME="Red Hat Enterprise Linux Server 7.2 (Maipo)"
ANSI_COLOR="0;31"
CPE_NAME="cpe:/o:redhat:enterprise_linux:7.2:GA:server"
redhat-release: Red Hat Enterprise Linux Server release 7.2 (Maipo)
system-release: Red Hat Enterprise Linux Server release 7.2 (Maipo)
system-release-cpe: cpe:/o:redhat:enterprise_linux:7.2:ga:server
```

```
uname -a:
Linux localhost.localdomain 3.10.0-327.el7.x86_64 #1 SMP Thu Oct 29 17:29:29
EDT 2015 x86_64 x86_64 x86_64 GNU/Linux
```

```
run-level 3 Jun 29 09:12
```

```
SPEC is set to: /root/cpu2006-1.2
Filesystem      Type  Size  Used Avail Use% Mounted on
/dev/sda2       xfs   226G  9.7G  217G   5% /
Additional information from dmidecode:
```

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Platform Notes (Continued)

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. 2.2.1 06/06/2016

Memory:

16x 00CE00B300CE M393A4K40BB1-CRC 32 GB 2 rank 2400 MHz

8x 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/cpu2006-1.2/libs/32:/root/cpu2006-1.2/libs/64:/root/cpu2006-1.2/sh"

OMP_NUM_THREADS = "24"

Binaries compiled on a system with 1x Intel Core i5-4670K CPU + 32GB memory using RedHat EL 7.1

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

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

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Base Portability Flags (Continued)

```

437.leslie3d: -DSPEC_CPU_LP64
444.namd: -DSPEC_CPU_LP64
447.deall: -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

```

Benchmarks using both Fortran and C:

```

icc -m64 ifort -m64

```



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Peak Portability Flags

Same as Base Portability Flags

Peak Optimization Flags

C benchmarks:

433.milc: basepeak = yes

470.lbm: basepeak = yes

482.sphinx3: basepeak = yes

C++ benchmarks:

444.namd: -xCORE-AVX2(pass 2) -prof-gen:threadsafe(pass 1)
-ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2)
-par-num-threads=1(pass 1) -prof-use(pass 2) -fno-alias
-auto-ilp32

447.dealII: basepeak = yes

450.soplex: basepeak = yes

453.povray: -xCORE-AVX2(pass 2) -prof-gen:threadsafe(pass 1)
-ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2)
-par-num-threads=1(pass 1) -prof-use(pass 2) -unroll4
-ansi-alias

Fortran benchmarks:

410.bwaves: basepeak = yes

416.gamess: -xCORE-AVX2(pass 2) -prof-gen:threadsafe(pass 1)
-ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2)
-par-num-threads=1(pass 1) -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:threadsafe(pass 1)
-ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2)
-par-num-threads=1(pass 1) -prof-use(pass 2) -unroll2
-inline-level=0 -opt-prefetch -parallel

465.tonto: -xCORE-AVX2(pass 2) -prof-gen:threadsafe(pass 1)
-ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2)
-par-num-threads=1(pass 1) -prof-use(pass 2) -inline-calloc

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Peak Optimization Flags (Continued)

465.tonto (continued):

`-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-ic16.0-official-linux64.html>

<http://www.spec.org/cpu2006/flags/Dell-Platform-Settings-V1.2-revD.20151006.html>

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

<http://www.spec.org/cpu2006/flags/Intel-ic16.0-official-linux64.xml>

<http://www.spec.org/cpu2006/flags/Dell-Platform-Settings-V1.2-revD.20151006.xml>

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