



# SPEC<sup>®</sup> CFP2006 Result

Copyright 2006-2016 Standard Performance Evaluation Corporation

Hewlett Packard Enterprise

(Test Sponsor: HPE)

ProLiant XL450 Gen9

(2.20 GHz, Intel Xeon E5-2630 v4)

SPECfp<sup>®</sup>2006 =

112

SPECfp\_base2006 =

106

CPU2006 license: 3

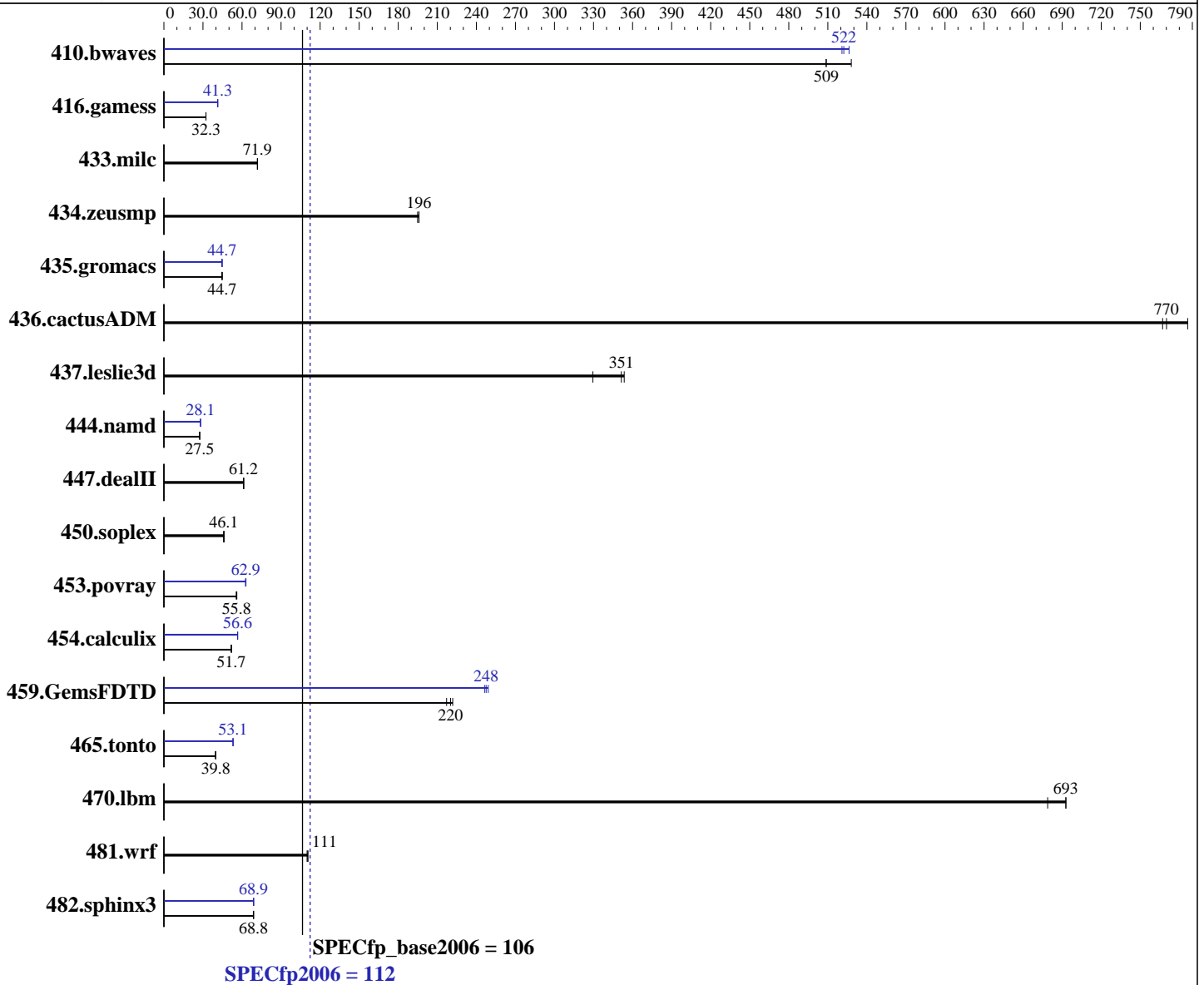
Test sponsor: HPE

Tested by: HPE

Test date: Apr-2016

Hardware Availability: Mar-2016

Software Availability: Nov-2015



## Hardware

CPU Name: Intel Xeon E5-2630 v4  
 CPU Characteristics: Intel Turbo Boost Technology up to 3.10 GHz  
 CPU MHz: 2200  
 FPU: Integrated  
 CPU(s) enabled: 20 cores, 2 chips, 10 cores/chip  
 CPU(s) orderable: 1,2 chips  
 Primary Cache: 32 KB I + 32 KB D on chip per core  
 Secondary Cache: 256 KB I+D on chip per core

Continued on next page

## Software

Operating System: Red Hat Enterprise Linux Server release 7.2 (Maipo)  
 Kernel 3.10.0-327.el7.x86\_64  
 Compiler: C/C++: Version 16.0.0.101 of Intel C++ Studio XE for Linux;  
 Fortran: Version 16.0.0.101 of Intel Fortran Studio XE for Linux  
 Auto Parallel: Yes  
 File System: xfs

Continued on next page



# SPEC CFP2006 Result

Copyright 2006-2016 Standard Performance Evaluation Corporation

Hewlett Packard Enterprise

(Test Sponsor: HPE)

ProLiant XL450 Gen9

(2.20 GHz, Intel Xeon E5-2630 v4)

SPECfp2006 = 112

SPECfp\_base2006 = 106

CPU2006 license: 3

Test sponsor: HPE

Tested by: HPE

Test date: Apr-2016

Hardware Availability: Mar-2016

Software Availability: Nov-2015

L3 Cache: 25 MB I+D on chip per chip  
 Other Cache: None  
 Memory: 256 GB (8 x 32 GB 2Rx4 PC4-2400T-R, running at 2133 MHz)  
 Disk Subsystem: 2 x 480 GB SATA SSD, RAID 1  
 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	<b><u>26.7</u></b>	<b><u>509</u></b>	25.7	528	26.7	509	26.1	521	25.8	526	<b><u>26.0</u></b>	<b><u>522</u></b>
416.gamess	607	32.3	<b><u>606</u></b>	<b><u>32.3</u></b>	606	32.3	474	41.3	473	41.4	<b><u>474</u></b>	<b><u>41.3</u></b>
433.milc	128	71.7	<b><u>128</u></b>	<b><u>71.9</u></b>	128	71.9	128	71.7	<b><u>128</u></b>	<b><u>71.9</u></b>	128	71.9
434.zeusmp	46.4	196	<b><u>46.5</u></b>	<b><u>196</u></b>	46.7	195	46.4	196	<b><u>46.5</u></b>	<b><u>196</u></b>	46.7	195
435.gromacs	159	44.8	160	44.5	<b><u>160</u></b>	<b><u>44.7</u></b>	<b><u>160</u></b>	<b><u>44.7</u></b>	159	44.8	161	44.4
436.cactusADM	<b><u>15.5</u></b>	<b><u>770</u></b>	15.6	767	15.2	786	<b><u>15.5</u></b>	<b><u>770</u></b>	15.6	767	15.2	786
437.leslie3d	28.5	330	<b><u>26.8</u></b>	<b><u>351</u></b>	26.6	354	28.5	330	<b><u>26.8</u></b>	<b><u>351</u></b>	26.6	354
444.namd	292	27.5	292	27.5	<b><u>292</u></b>	<b><u>27.5</u></b>	285	28.1	<b><u>285</u></b>	<b><u>28.1</u></b>	285	28.1
447.dealII	<b><u>187</u></b>	<b><u>61.2</u></b>	187	61.2	187	61.3	<b><u>187</u></b>	<b><u>61.2</u></b>	187	61.2	187	61.3
450.soplex	182	45.8	<b><u>181</u></b>	<b><u>46.1</u></b>	180	46.2	182	45.8	<b><u>181</u></b>	<b><u>46.1</u></b>	180	46.2
453.povray	<b><u>95.3</u></b>	<b><u>55.8</u></b>	95.7	55.6	95.0	56.0	84.4	63.0	<b><u>84.5</u></b>	<b><u>62.9</u></b>	84.9	62.7
454.calculix	159	51.9	159	51.7	<b><u>159</u></b>	<b><u>51.7</u></b>	<b><u>146</u></b>	<b><u>56.6</u></b>	146	56.7	146	56.6
459.GemsFDTD	47.8	222	48.9	217	<b><u>48.2</u></b>	<b><u>220</u></b>	43.0	246	<b><u>42.9</u></b>	<b><u>248</u></b>	42.6	249
465.tonto	249	39.6	<b><u>247</u></b>	<b><u>39.8</u></b>	247	39.8	<b><u>185</u></b>	<b><u>53.1</u></b>	185	53.1	185	53.0
470.lbm	<b><u>19.8</u></b>	<b><u>693</u></b>	20.2	679	19.8	693	<b><u>19.8</u></b>	<b><u>693</u></b>	20.2	679	19.8	693
481.wrf	102	110	<b><u>101</u></b>	<b><u>111</u></b>	101	111	102	110	<b><u>101</u></b>	<b><u>111</u></b>	101	111
482.sphinx3	283	69.0	284	68.7	<b><u>283</u></b>	<b><u>68.8</u></b>	283	69.0	<b><u>283</u></b>	<b><u>68.9</u></b>	283	68.8

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"  
 Transparent Huge Pages enabled with:  
 echo always > /sys/kernel/mm/transparent\_hugepage/enabled

## Platform Notes

BIOS Configuration:  
 Intel Hyperthreading set to Disabled  
 Power Profile set to Custom  
 Power Regulator to HP Static High Performance Mode  
 Minimum Processor Idle Power Core C-State set to C6 State  
 Minimum Processor Idle Power Package C-State set to No Package State  
 QPI Snoop Configuration set to Home Snoop

Continued on next page



# SPEC CFP2006 Result

Copyright 2006-2016 Standard Performance Evaluation Corporation

**Hewlett Packard Enterprise**

(Test Sponsor: HPE)

ProLiant XL450 Gen9  
(2.20 GHz, Intel Xeon E5-2630 v4)

**SPECfp2006 = 112**

**SPECfp\_base2006 = 106**

**CPU2006 license:** 3

**Test sponsor:** HPE

**Tested by:** HPE

**Test date:** Apr-2016

**Hardware Availability:** Mar-2016

**Software Availability:** Nov-2015

## Platform Notes (Continued)

Collaborative Power Control set to Disabled  
Thermal Configuration set to Maximum Cooling  
Processor Power and Utilization Monitoring set to Disabled  
Memory Refresh Rate set to 1x Refresh

Sysinfo program /home/cpu2006/config/sysinfo.rev6914  
\$Rev: 6914 \$ \$Date:: 2014-06-25 #\$ e3fbb8667b5a285932ceab81e28219e1  
running on XL450-G9-node2 Thu Apr 28 12:49:06 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 E5-2630 v4 @ 2.20GHz
 2 "physical id"s (chips)
 20 "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  : 10
  physical 0: cores 0 2 3 4 8 9 10 11 12
  physical 1: cores 0 2 3 4 8 9 10 11 12
cache size : 25600 KB
```

```
From /proc/meminfo
MemTotal:      263712764 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 XL450-G9-node2 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 Apr 28 12:33

SPEC is set to: /home/cpu2006

Continued on next page



# SPEC CFP2006 Result

Copyright 2006-2016 Standard Performance Evaluation Corporation

**Hewlett Packard Enterprise**

(Test Sponsor: HPE)

ProLiant XL450 Gen9  
(2.20 GHz, Intel Xeon E5-2630 v4)

**SPECfp2006 = 112**

**SPECfp\_base2006 = 106**

**CPU2006 license:** 3

**Test sponsor:** HPE

**Tested by:** HPE

**Test date:** Apr-2016

**Hardware Availability:** Mar-2016

**Software Availability:** Nov-2015

## Platform Notes (Continued)

Filesystem	Type	Size	Used	Avail	Use%	Mounted on
/dev/sda4	xfs	438G	20G	419G	5%	/

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 HP U21 03/10/2016

Memory:

8x UNKNOWN NOT AVAILABLE

8x UNKNOWN NOT AVAILABLE 32 GB 2 rank 2400 MHz, configured at 2133 MHz

(End of data from sysinfo program)

Regarding the sysinfo display about the memory installed, the correct amount of memory is 128 GB and the dmidecode description should have one line reading as: 8x UNKNOWN NOT AVAILABLE 32 GB 2 rank 2400 MHz, configured at 2133 MHz

## General Notes

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

KMP\_AFFINITY = "granularity=fine,compact"

OMP\_NUM\_THREADS = "20"

LD\_LIBRARY\_PATH = "/home/cpu2006/libs/32:/home/cpu2006/libs/64:/home/cpu2006/sh"

Binaries compiled on a system with 1x Intel Xeon E5-2660 v4 CPU + 128GB memory using RedHat EL 7.2

## 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

Continued on next page

Standard Performance Evaluation Corporation

info@spec.org

http://www.spec.org/

Page 4



# SPEC CFP2006 Result

Copyright 2006-2016 Standard Performance Evaluation Corporation

Hewlett Packard Enterprise

(Test Sponsor: HPE)

ProLiant XL450 Gen9

(2.20 GHz, Intel Xeon E5-2630 v4)

SPECfp2006 =

112

SPECfp\_base2006 =

106

CPU2006 license: 3

Test sponsor: HPE

Tested by: HPE

Test date: Apr-2016

Hardware Availability: Mar-2016

Software Availability: Nov-2015

## Base Portability Flags (Continued)

```

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 -static -parallel -opt-prefetch
-ansi-alias -qopt-prefetch-issue-excl-hint

```

C++ benchmarks:

```

-xCORE-AVX2 -ipo -O3 -no-prec-div -static -opt-prefetch -ansi-alias

```

Fortran benchmarks:

```

-xCORE-AVX2 -ipo -O3 -no-prec-div -static -parallel -opt-prefetch
-fp-model fast=2
-qopt-prefetch-issue-excl-hint

```

Benchmarks using both Fortran and C:

```

-xCORE-AVX2 -ipo -O3 -no-prec-div -static -parallel -opt-prefetch
-ansi-alias -qopt-prefetch-issue-excl-hint
-fp-model fast=2

```

## Peak Compiler Invocation

C benchmarks:

```

icc -m64

```

C++ benchmarks:

```

icpc -m64

```

Fortran benchmarks:

```

ifort -m64

```

Continued on next page

Standard Performance Evaluation Corporation

info@spec.org

http://www.spec.org/

Page 5



# SPEC CFP2006 Result

Copyright 2006-2016 Standard Performance Evaluation Corporation

Hewlett Packard Enterprise

(Test Sponsor: HPE)

ProLiant XL450 Gen9

(2.20 GHz, Intel Xeon E5-2630 v4)

SPECfp2006 =

112

SPECfp\_base2006 =

106

CPU2006 license: 3

Test sponsor: HPE

Tested by: HPE

Test date: Apr-2016

Hardware Availability: Mar-2016

Software Availability: Nov-2015

## 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: basepeak = yes

470.lbm: basepeak = yes

482.sphinx3: -xCORE-AVX2 -ipo -O3 -no-prec-div -static -parallel  
-opt-prefetch -ansi-alias  
-fp-model fast=2  
-qopt-prefetch-issue-excl-hint -funroll-all-loops

-nofor-main

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.dealIII: 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: -xCORE-AVX2 -ipo -O3 -no-prec-div -static -parallel  
-opt-prefetch  
-fp-model fast=2  
-qopt-prefetch-issue-excl-hint -funroll-all-loops

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-

Continued on next page



# SPEC CFP2006 Result

Copyright 2006-2016 Standard Performance Evaluation Corporation

Hewlett Packard Enterprise

(Test Sponsor: HPE)

ProLiant XL450 Gen9

(2.20 GHz, Intel Xeon E5-2630 v4)

SPECfp2006 =

112

SPECfp\_base2006 =

106

CPU2006 license: 3

Test sponsor: HPE

Tested by: HPE

Test date: Apr-2016

Hardware Availability: Mar-2016

Software Availability: Nov-2015

## Peak Optimization Flags (Continued)

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  
-opt-malloc-options=3 -auto -unroll4

Benchmarks using both Fortran and C:

435.gromacs: -xCORE-AVX2 -ipo -O3 -no-prec-div -static -parallel  
-opt-prefetch -ansi-alias  
-fp-model fast=2  
-qopt-prefetch-issue-excl-hint -funroll-all-loops  
-auto-ilp32

-nofor-main

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/HP-Platform-Flags-Intel-V1.2-HSW-revE.html>

<http://www.spec.org/cpu2006/flags/HP-Compiler-Flags-Intel-V1.2-BDW-revE.html>

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

<http://www.spec.org/cpu2006/flags/HP-Platform-Flags-Intel-V1.2-HSW-revE.xml>

<http://www.spec.org/cpu2006/flags/HP-Compiler-Flags-Intel-V1.2-BDW-revE.xml>

SPEC and SPECfp are registered trademarks of the Standard Performance Evaluation Corporation. All other brand and product names appearing in this result are trademarks or registered trademarks of their respective holders.

For questions about this result, please contact the tester.  
For other inquiries, please contact [webmaster@spec.org](mailto:webmaster@spec.org).

Tested with SPEC CPU2006 v1.2.

Report generated on Tue May 17 16:51:11 2016 by SPEC CPU2006 PS/PDF formatter v6932.

Originally published on 17 May 2016.