



# SPEC® CFP2006 Result

Copyright 2006-2016 Standard Performance Evaluation Corporation

## Lenovo Group Limited

SPECfp®\_rate2006 = 797

Lenovo Flex System x240 M5  
(1.80 GHz, Intel Xeon E5-2648L v4)

SPECfp\_rate\_base2006 = 777

CPU2006 license: 9017

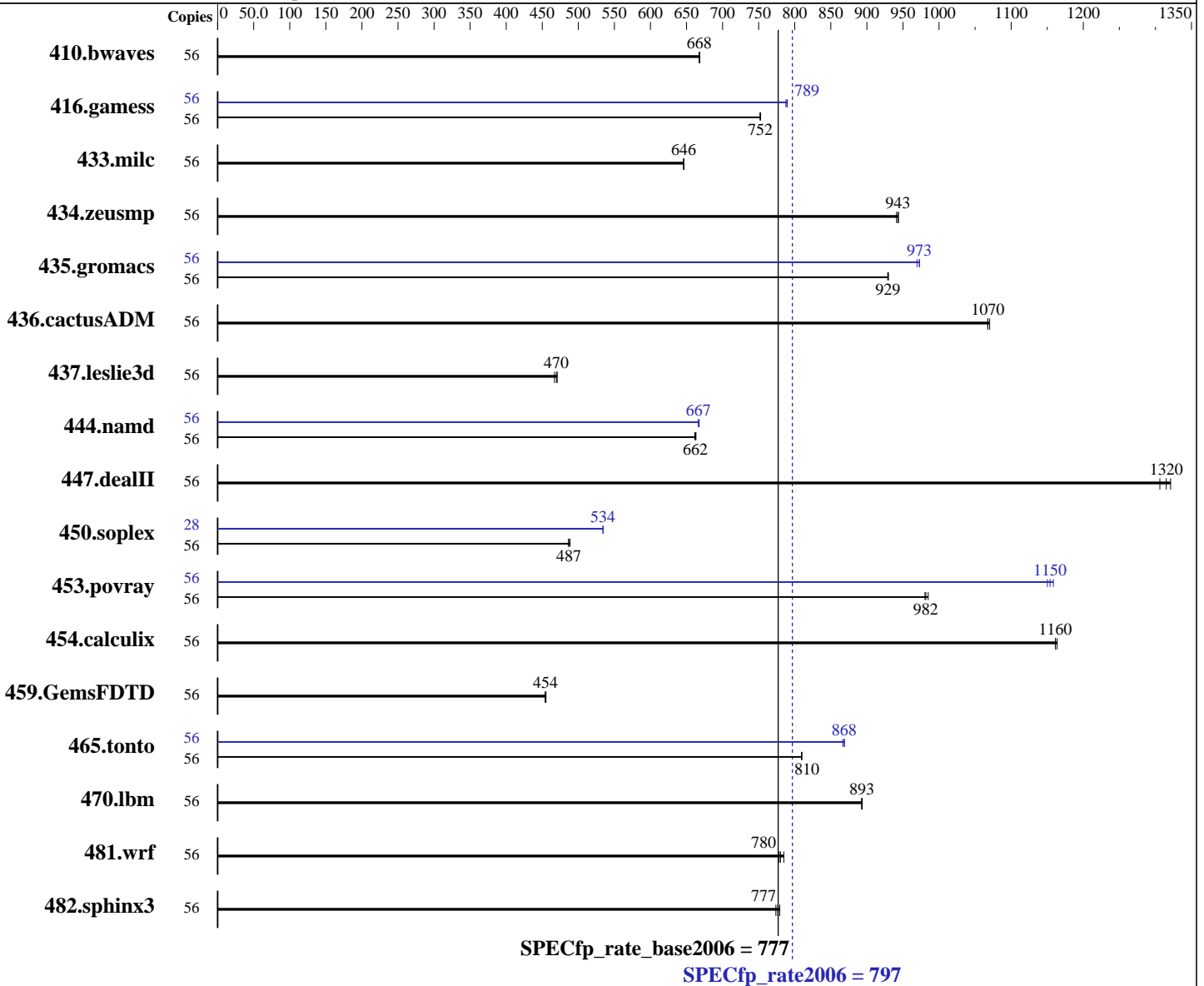
Test date: Jun-2016

Test sponsor: Lenovo Group Limited

Hardware Availability: Mar-2016

Tested by: Lenovo Group Limited

Software Availability: Dec-2015



**Hardware**

CPU Name: Intel Xeon E5-2648L v4  
 CPU Characteristics: Intel Turbo Boost Technology up to 2.50 GHz  
 CPU MHz: 1800  
 FPU: Integrated  
 CPU(s) enabled: 28 cores, 2 chips, 14 cores/chip, 2 threads/core  
 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: SUSE Linux Enterprise Server 12 SP1 (x86\_64)  
 Kernel 3.12.49-11-default  
 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: No  
 File System: xfs  
 System State: Run level 3 (multi-user)

*Continued on next page*



# SPEC CFP2006 Result

Copyright 2006-2016 Standard Performance Evaluation Corporation

## Lenovo Group Limited

SPECfp\_rate2006 = 797

Lenovo Flex System x240 M5  
(1.80 GHz, Intel Xeon E5-2648L v4)

SPECfp\_rate\_base2006 = 777

CPU2006 license: 9017

Test date: Jun-2016

Test sponsor: Lenovo Group Limited

Hardware Availability: Mar-2016

Tested by: Lenovo Group Limited

Software Availability: Dec-2015

L3 Cache: 35 MB I+D on chip per chip  
Other Cache: None  
Memory: 256 GB (16 x 16 GB 2Rx4 PC4-2400T-R)  
Disk Subsystem: 2 x 600 GB 15000 RPM SAS, RAID 1  
Other Hardware: None

Base Pointers: 32/64-bit  
Peak Pointers: 32/64-bit  
Other Software: None

## Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	56	1139	668	1140	668	<b>1140</b>	<b>668</b>	56	1139	668	1140	668	<b>1140</b>	<b>668</b>
416.gamess	56	1457	752	<b>1457</b>	<b>752</b>	1458	752	56	<b>1389</b>	<b>789</b>	1388	790	1392	788
433.milc	56	<b>796</b>	<b>646</b>	796	646	796	646	56	<b>796</b>	<b>646</b>	796	646	796	646
434.zeusmp	56	542	941	540	944	<b>540</b>	<b>943</b>	56	542	941	540	944	<b>540</b>	<b>943</b>
435.gromacs	56	430	930	430	929	<b>430</b>	<b>929</b>	56	411	973	412	969	<b>411</b>	<b>973</b>
436.cactusADM	56	625	1070	<b>627</b>	<b>1070</b>	627	1070	56	625	1070	<b>627</b>	<b>1070</b>	627	1070
437.leslie3d	56	1127	467	<b>1121</b>	<b>470</b>	1118	471	56	1127	467	<b>1121</b>	<b>470</b>	1118	471
444.namd	56	<b>678</b>	<b>662</b>	677	663	679	662	56	674	666	<b>674</b>	<b>667</b>	673	668
447.dealII	56	485	1320	490	1310	<b>487</b>	<b>1320</b>	56	485	1320	490	1310	<b>487</b>	<b>1320</b>
450.soplex	56	956	489	960	486	<b>960</b>	<b>487</b>	28	437	535	<b>437</b>	<b>534</b>	437	534
453.povray	56	304	981	302	985	<b>303</b>	<b>982</b>	56	257	1160	<b>258</b>	<b>1150</b>	259	1150
454.calculix	56	398	1160	397	1160	<b>398</b>	<b>1160</b>	56	398	1160	397	1160	<b>398</b>	<b>1160</b>
459.GemsFDTD	56	1308	454	1305	455	<b>1308</b>	<b>454</b>	56	1308	454	1305	455	<b>1308</b>	<b>454</b>
465.tonto	56	<b>681</b>	<b>810</b>	681	809	680	810	56	<b>634</b>	<b>868</b>	636	866	634	869
470.lbm	56	861	893	<b>862</b>	<b>893</b>	862	893	56	861	893	<b>862</b>	<b>893</b>	862	893
481.wrf	56	<b>802</b>	<b>780</b>	797	785	804	778	56	<b>802</b>	<b>780</b>	797	785	804	778
482.sphinx3	56	1401	779	<b>1406</b>	<b>777</b>	1410	774	56	1401	779	<b>1406</b>	<b>777</b>	1410	774

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

## Submit Notes

The numactl mechanism was used to bind copies to processors. The config file option 'submit' was used to generate numactl commands to bind each copy to a specific processor. For details, please see the config file.

## 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  
Filesystem page cache cleared with:  
echo 1 > /proc/sys/vm/drop\_caches



# SPEC CFP2006 Result

Copyright 2006-2016 Standard Performance Evaluation Corporation

## Lenovo Group Limited

SPECfp\_rate2006 = 797

Lenovo Flex System x240 M5  
(1.80 GHz, Intel Xeon E5-2648L v4)

SPECfp\_rate\_base2006 = 777

CPU2006 license: 9017

Test date: Jun-2016

Test sponsor: Lenovo Group Limited

Hardware Availability: Mar-2016

Tested by: Lenovo Group Limited

Software Availability: Dec-2015

### Platform Notes

#### BIOS Configuration:

Operating Mode set to "Maximum Performance"  
COD Preference set to Enable  
Sysinfo program /home/cpu2006-1.2-ic16.0/config/sysinfo.rev6914  
\$Rev: 6914 \$ \$Date:: 2014-06-25 #\$ e3fbb8667b5a285932ceab81e28219e1  
running on Bonnevil Fri Jun 3 23:15:02 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 E5-2648L v4@ 1.80GHz
 2 "physical id"s (chips)
 56 "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    : 14
  siblings     : 28
  physical 0: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14
  physical 1: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14
cache size     : 17920 KB
```

#### From /proc/meminfo

```
MemTotal:      263825896 kB
HugePages_Total: 0
Hugepagesize:   2048 kB
```

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

```
SuSE-release:
SUSE Linux Enterprise Server 12 (x86_64)
VERSION = 12
PATCHLEVEL = 1
# This file is deprecated and will be removed in a future service pack or release.
# Please check /etc/os-release for details about this release.
os-release:
NAME="SLES"
VERSION="12-SP1"
VERSION_ID="12.1"
PRETTY_NAME="SUSE Linux Enterprise Server 12 SP1"
ID="sles"
ANSI_COLOR="0;32"
CPE_NAME="cpe:/o:suse:sles:12:sp1"
```

#### uname -a:

```
Linux Bonnevil 3.12.49-11-default #1 SMP Wed Nov 11 20:52:43 UTC 2015
(8d714a0) x86_64 x86_64 x86_64 GNU/Linux
```

run-level 3 Jun 3 09:30

Continued on next page



# SPEC CFP2006 Result

Copyright 2006-2016 Standard Performance Evaluation Corporation

## Lenovo Group Limited

**SPECfp\_rate2006 = 797**

Lenovo Flex System x240 M5  
(1.80 GHz, Intel Xeon E5-2648L v4)

**SPECfp\_rate\_base2006 = 777**

**CPU2006 license:** 9017

**Test date:** Jun-2016

**Test sponsor:** Lenovo Group Limited

**Hardware Availability:** Mar-2016

**Tested by:** Lenovo Group Limited

**Software Availability:** Dec-2015

## Platform Notes (Continued)

SPEC is set to: /home/cpu2006-1.2-ic16.0

Filesystem	Type	Size	Used	Avail	Use%	Mounted on
/dev/sda4	xfs	502G	6.4G	496G	2%	/home

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 LENOVO -[C4E124J-2.10]- 05/05/2016  
 Memory:  
 16x Hynix HMA42GR7AFR4N-UH 16 GB 2 rank 2400 MHz  
 8x NO DIMM Unknown

(End of data from sysinfo program)

## General Notes

Environment variables set by runspec before the start of the run:  
 LD\_LIBRARY\_PATH = "/home/cpu2006-1.2-ic16.0/libs/32:/home/cpu2006-1.2-ic16.0/libs/64:/home/cpu2006-1.2-ic16.0/sh"

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  
 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



# SPEC CFP2006 Result

Copyright 2006-2016 Standard Performance Evaluation Corporation

**Lenovo Group Limited**

**SPECfp\_rate2006 = 797**

Lenovo Flex System x240 M5  
(1.80 GHz, Intel Xeon E5-2648L v4)

**SPECfp\_rate\_base2006 = 777**

**CPU2006 license:** 9017

**Test date:** Jun-2016

**Test sponsor:** Lenovo Group Limited

**Hardware Availability:** Mar-2016

**Tested by:** Lenovo Group Limited

**Software Availability:** Dec-2015

## 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 -opt-prefetch -auto-p32
-ansi-alias -opt-mem-layout-trans=3

```

C++ benchmarks:

```

-xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch -auto-p32
-ansi-alias -opt-mem-layout-trans=3

```

Fortran benchmarks:

```

-xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch

```

Benchmarks using both Fortran and C:

```

-xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch -auto-p32
-ansi-alias -opt-mem-layout-trans=3

```

## Peak Compiler Invocation

C benchmarks:

```

icc -m64

```

C++ benchmarks (except as noted below):

```

icpc -m64

```

```

450.soplex: icpc -m32 -L/opt/intel/compilers_and_libraries_2016/linux/compiler/lib/ia32_lin

```

Continued on next page



# SPEC CFP2006 Result

Copyright 2006-2016 Standard Performance Evaluation Corporation

**Lenovo Group Limited**

**SPECfp\_rate2006 = 797**

Lenovo Flex System x240 M5  
(1.80 GHz, Intel Xeon E5-2648L v4)

**SPECfp\_rate\_base2006 = 777**

**CPU2006 license:** 9017

**Test date:** Jun-2016

**Test sponsor:** Lenovo Group Limited

**Hardware Availability:** Mar-2016

**Tested by:** Lenovo Group Limited

**Software Availability:** Dec-2015

## Peak Compiler Invocation (Continued)

Fortran benchmarks:

ifort -m64

Benchmarks using both Fortran and C:

icc -m64 ifort -m64

## Peak 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: -D\_FILE\_OFFSET\_BITS=64  
 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

## 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) -opt-mem-layout-trans=3(pass 2)  
 -prof-use(pass 2) -fno-alias -auto-ilp32

447.dealII: basepeak = yes

Continued on next page



# SPEC CFP2006 Result

Copyright 2006-2016 Standard Performance Evaluation Corporation

## Lenovo Group Limited

SPECfp\_rate2006 = 797

Lenovo Flex System x240 M5  
(1.80 GHz, Intel Xeon E5-2648L v4)

SPECfp\_rate\_base2006 = 777

CPU2006 license: 9017

Test date: Jun-2016

Test sponsor: Lenovo Group Limited

Hardware Availability: Mar-2016

Tested by: Lenovo Group Limited

Software Availability: Dec-2015

## Peak Optimization Flags (Continued)

450.soplex: -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) -opt-mem-layout-trans=3(pass 2)  
-prof-use(pass 2) -opt-malloc-options=3

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) -opt-mem-layout-trans=3(pass 2)  
-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: basepeak = yes

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) -unroll4 -auto  
-inline-calloc -opt-malloc-options=3

Benchmarks using both Fortran and C:

435.gromacs: -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) -opt-mem-layout-trans=3(pass 2)  
-prof-use(pass 2) -opt-prefetch -auto-ilp32

436.cactusADM: basepeak = yes

454.calculix: basepeak = yes

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/Lenovo-Platform-Flags-V1.2-BDW-B.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/Lenovo-Platform-Flags-V1.2-BDW-B.xml>



# SPEC CFP2006 Result

Copyright 2006-2016 Standard Performance Evaluation Corporation

## Lenovo Group Limited

Lenovo Flex System x240 M5  
(1.80 GHz, Intel Xeon E5-2648L v4)

SPECfp\_rate2006 = 797

SPECfp\_rate\_base2006 = 777

**CPU2006 license:** 9017

**Test sponsor:** Lenovo Group Limited

**Tested by:** Lenovo Group Limited

**Test date:** Jun-2016

**Hardware Availability:** Mar-2016

**Software Availability:** Dec-2015

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 Jun 28 17:32:09 2016 by SPEC CPU2006 PS/PDF formatter v6932.  
Originally published on 28 June 2016.