



# SPEC<sup>®</sup> CFP2006 Result

Copyright 2006-2014 Standard Performance Evaluation Corporation

## IBM Corporation

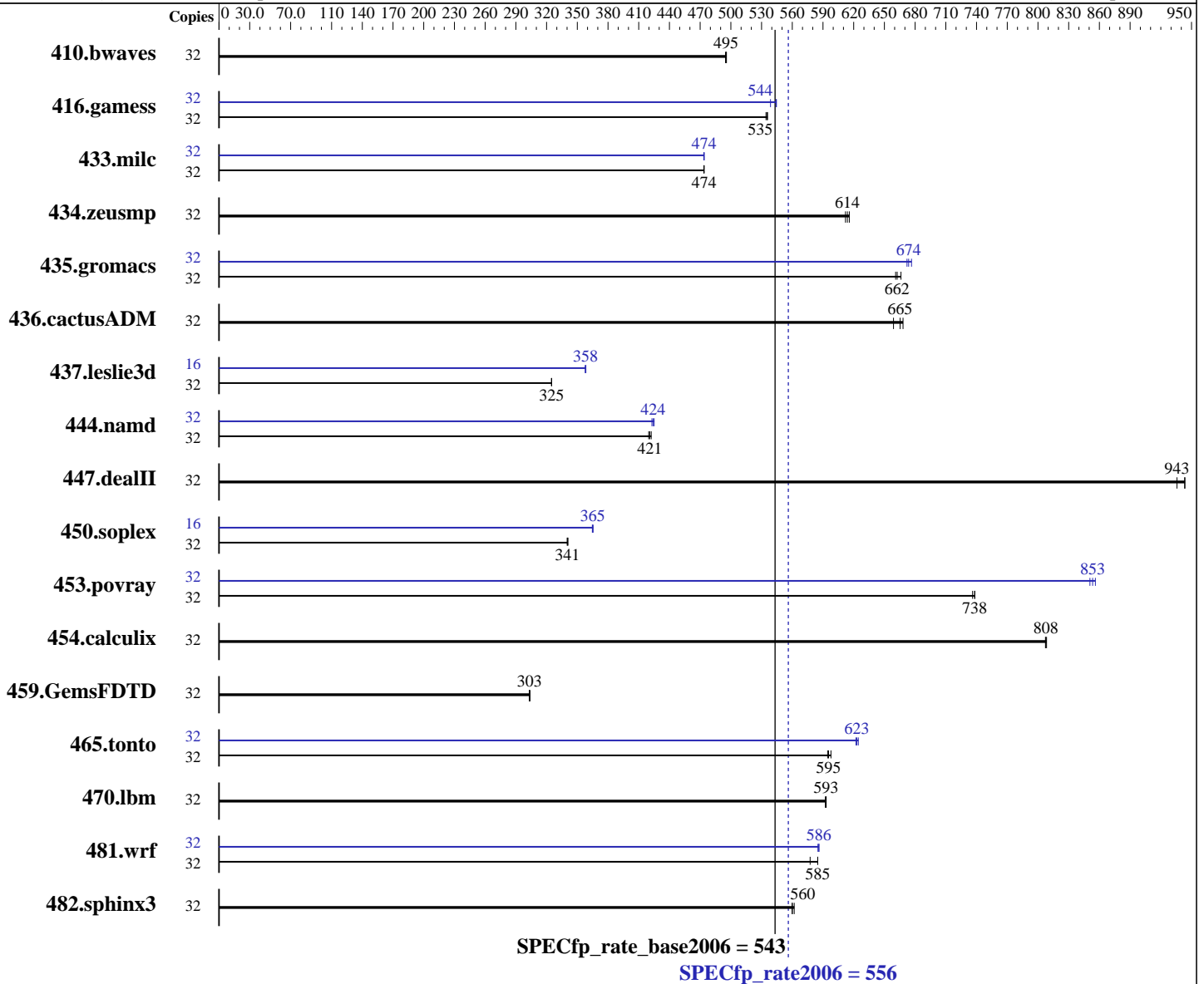
### SPECfp<sup>®</sup>\_rate2006 = 556

IBM System x3650 M4 HD  
(Intel Xeon E5-2650 v2, 2.60 GHz)

### SPECfp\_rate\_base2006 = 543

**CPU2006 license:** 11  
**Test sponsor:** IBM Corporation  
**Tested by:** IBM Corporation

**Test date:** Oct-2013  
**Hardware Availability:** Dec-2013  
**Software Availability:** Sep-2013



### Hardware

CPU Name: Intel Xeon E5-2650 v2  
 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 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 6.4 (Santiago)  
 2.6.32-358.el6.x86\_64  
 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: No  
 File System: ext4

Continued on next page



# SPEC CFP2006 Result

Copyright 2006-2014 Standard Performance Evaluation Corporation

## IBM Corporation

SPECfp\_rate2006 = **556**

IBM System x3650 M4 HD  
(Intel Xeon E5-2650 v2, 2.60 GHz)

SPECfp\_rate\_base2006 = **543**

**CPU2006 license:** 11  
**Test sponsor:** IBM Corporation  
**Tested by:** IBM Corporation

**Test date:** Oct-2013  
**Hardware Availability:** Dec-2013  
**Software Availability:** Sep-2013

**L3 Cache:** 20 MB I+D on chip per chip  
**Other Cache:** None  
**Memory:** 256 GB (16 x 16 GB 2Rx4 PC3-14900R-13, ECC)  
**Disk Subsystem:** 1 x 400 GB SAS SSD, RAID 0  
**Other Hardware:** None

**System State:** Run level 3 (multi-user)  
**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    | 32     | 877         | 496        | <b>878</b>  | <b>495</b> | 879         | 495        | 32     | 877         | 496        | <b>878</b>  | <b>495</b> | 879         | 495        |
| 416.gamess    | 32     | <b>1171</b> | <b>535</b> | 1173        | 534        | 1169        | 536        | 32     | <b>1151</b> | <b>544</b> | 1163        | 539        | 1151        | 545        |
| 433.milc      | 32     | 620         | 474        | <b>620</b>  | <b>474</b> | 620         | 474        | 32     | 620         | 474        | <b>620</b>  | <b>474</b> | 620         | 474        |
| 434.zeusmp    | 32     | 473         | 616        | <b>474</b>  | <b>614</b> | 476         | 612        | 32     | 473         | 616        | <b>474</b>  | <b>614</b> | 476         | 612        |
| 435.gromacs   | 32     | 343         | 666        | 346         | 661        | <b>345</b>  | <b>662</b> | 32     | 340         | 672        | 338         | 676        | <b>339</b>  | <b>674</b> |
| 436.cactusADM | 32     | 572         | 668        | 580         | 659        | <b>575</b>  | <b>665</b> | 32     | 572         | 668        | 580         | 659        | <b>575</b>  | <b>665</b> |
| 437.leslie3d  | 32     | 926         | 325        | <b>926</b>  | <b>325</b> | 926         | 325        | 16     | 420         | 358        | 420         | 358        | <b>420</b>  | <b>358</b> |
| 444.namd      | 32     | 611         | 420        | 608         | 422        | <b>610</b>  | <b>421</b> | 32     | 604         | 425        | 607         | 423        | <b>605</b>  | <b>424</b> |
| 447.dealII    | 32     | 388         | 944        | <b>388</b>  | <b>943</b> | 391         | 936        | 32     | 388         | 944        | <b>388</b>  | <b>943</b> | 391         | 936        |
| 450.soplex    | 32     | 783         | 341        | <b>784</b>  | <b>341</b> | 785         | 340        | 16     | <b>366</b>  | <b>365</b> | 365         | 365        | 366         | 365        |
| 453.povray    | 32     | 231         | 736        | 231         | 738        | <b>231</b>  | <b>738</b> | 32     | 200         | 851        | 199         | 856        | <b>199</b>  | <b>853</b> |
| 454.calculix  | 32     | 327         | 807        | 327         | 808        | <b>327</b>  | <b>808</b> | 32     | 327         | 807        | 327         | 808        | <b>327</b>  | <b>808</b> |
| 459.GemsFDTD  | 32     | 1120        | 303        | <b>1120</b> | <b>303</b> | 1117        | 304        | 32     | 1120        | 303        | <b>1120</b> | <b>303</b> | 1117        | 304        |
| 465.tonto     | 32     | 527         | 598        | <b>529</b>  | <b>595</b> | 530         | 595        | 32     | <b>505</b>  | <b>623</b> | 504         | 625        | 506         | 622        |
| 470.lbm       | 32     | 741         | 593        | 742         | 592        | <b>742</b>  | <b>593</b> | 32     | 741         | 593        | 742         | 592        | <b>742</b>  | <b>593</b> |
| 481.wrf       | 32     | 611         | 585        | <b>611</b>  | <b>585</b> | 619         | 577        | 32     | 611         | 585        | <b>610</b>  | <b>586</b> | 610         | 586        |
| 482.sphinx3   | 32     | 1114        | 560        | 1110        | 562        | <b>1114</b> | <b>560</b> | 32     | 1114        | 560        | 1110        | 562        | <b>1114</b> | <b>560</b> |

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"  
Zone reclaim mode enabled with:  
echo 1 > /proc/sys/vm/zone\_reclaim\_mode



# SPEC CFP2006 Result

Copyright 2006-2014 Standard Performance Evaluation Corporation

## IBM Corporation

SPECfp\_rate2006 = 556

IBM System x3650 M4 HD  
(Intel Xeon E5-2650 v2, 2.60 GHz)

SPECfp\_rate\_base2006 = 543

**CPU2006 license:** 11  
**Test sponsor:** IBM Corporation  
**Tested by:** IBM Corporation

**Test date:** Oct-2013  
**Hardware Availability:** Dec-2013  
**Software Availability:** Sep-2013

### Platform Notes

BIOS setting:  
Operating Mode set to Maximum Performance  
Sysinfo program /home/SPECcpu-new/config/sysinfo.rev6818  
\$Rev: 6818 \$ \$Date:: 2012-07-17 #\$ e86d102572650a6e4d596a3cee98f191  
running on x3650M4Plus Thu Oct 24 03:19:20 2013

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 E5-2650 v2 @ 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:      264653012 kB
HugePages_Total: 0
Hugepagesize:  2048 kB
```

```
/usr/bin/lsb_release -d
Red Hat Enterprise Linux Server release 6.4 (Santiago)
```

```
From /etc/*release* /etc/*version*
redhat-release: Red Hat Enterprise Linux Server release 6.4 (Santiago)
system-release: Red Hat Enterprise Linux Server release 6.4 (Santiago)
system-release-cpe: cpe:/o:redhat:enterprise_linux:6server:ga:server
```

```
uname -a:
Linux x3650M4Plus 2.6.32-358.el6.x86_64 #1 SMP Tue Jan 29 11:47:41 EST 2013
x86_64 x86_64 x86_64 GNU/Linux
```

```
run-level 3 Oct 23 15:32
```

```
SPEC is set to: /home/SPECcpu-new
Filesystem      Type      Size Used Avail Use% Mounted on
/dev/mapper/vg_x3650m4plus-lv_home
  ext4          309G  225G   69G  77% /home
```

```
Additional information from dmidecode:
BIOS IBM  -[TESTBUILD-1.50]- 08/09/2013
Memory:
 8x Not Specified Not Specified
16x Samsung M393B2G70QH0-CMA 16 GB 1867 MHz 2 rank
Continued on next page
```



# SPEC CFP2006 Result

Copyright 2006-2014 Standard Performance Evaluation Corporation

## IBM Corporation

SPECfp\_rate2006 = 556

IBM System x3650 M4 HD  
(Intel Xeon E5-2650 v2, 2.60 GHz)

SPECfp\_rate\_base2006 = 543

**CPU2006 license:** 11  
**Test sponsor:** IBM Corporation  
**Tested by:** IBM Corporation

**Test date:** Oct-2013  
**Hardware Availability:** Dec-2013  
**Software Availability:** Sep-2013

## Platform Notes (Continued)

(End of data from sysinfo program)  
"Not Specified" memory information from dmidecode indicates unused DIMM slots.  
The BIOS IBM -[TESTBUILD-1.50] is equivalent to production version [VVE134TUS-1.51]

## General Notes

Environment variables set by runspec before the start of the run:  
LD\_LIBRARY\_PATH = "/home/SPECcpu-new/libs/32:/home/SPECcpu-new/libs/64:/home/SPECcpu-new/sh"

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/redhat\_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

Continued on next page



# SPEC CFP2006 Result

Copyright 2006-2014 Standard Performance Evaluation Corporation

**IBM Corporation**

**SPECfp\_rate2006 = 556**

IBM System x3650 M4 HD  
(Intel Xeon E5-2650 v2, 2.60 GHz)

**SPECfp\_rate\_base2006 = 543**

**CPU2006 license:** 11  
**Test sponsor:** IBM Corporation  
**Tested by:** IBM Corporation

**Test date:** Oct-2013  
**Hardware Availability:** Dec-2013  
**Software Availability:** Sep-2013

## Base Portability Flags (Continued)

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

C++ benchmarks:  
-xAVX -ipo -O3 -no-prec-div -opt-prefetch -auto-p32 -ansi-alias  
-opt-mem-layout-trans=3

Fortran benchmarks:  
-xAVX -ipo -O3 -no-prec-div -opt-prefetch

Benchmarks using both Fortran and C:  
-xAVX -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

Fortran benchmarks:  
ifort -m64

Benchmarks using both Fortran and C:  
icc -m64 ifort -m64

## Peak Portability Flags

410.bwaves: -DSPEC\_CPU\_LP64

Continued on next page



# SPEC CFP2006 Result

Copyright 2006-2014 Standard Performance Evaluation Corporation

## IBM Corporation

SPECfp\_rate2006 = 556

IBM System x3650 M4 HD  
(Intel Xeon E5-2650 v2, 2.60 GHz)

SPECfp\_rate\_base2006 = 543

**CPU2006 license:** 11  
**Test sponsor:** IBM Corporation  
**Tested by:** IBM Corporation

**Test date:** Oct-2013  
**Hardware Availability:** Dec-2013  
**Software Availability:** Sep-2013

## Peak 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
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: -xAVX(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)
         -no-prec-div(pass 2) -opt-mem-layout-trans=3(pass 2)
         -prof-use(pass 2) -auto-ilp32

```

470.lbm: basepeak = yes

482.sphinx3: basepeak = yes

C++ benchmarks:

```

444.namd: -xAVX(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)
         -no-prec-div(pass 2) -opt-mem-layout-trans=3(pass 2)
         -prof-use(pass 2) -fno-alias -auto-ilp32

```

447.dealII: basepeak = yes

```

450.soplex: -xAVX(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)
         -no-prec-div(pass 2) -opt-mem-layout-trans=3(pass 2)
         -prof-use(pass 2) -opt-malloc-options=3

```

```

453.povray: -xAVX(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)
         -no-prec-div(pass 2) -opt-mem-layout-trans=3(pass 2)
         -prof-use(pass 2) -unroll4 -ansi-alias

```

Fortran benchmarks:

410.bwaves: basepeak = yes

Continued on next page



# SPEC CFP2006 Result

Copyright 2006-2014 Standard Performance Evaluation Corporation

## IBM Corporation

**SPECfp\_rate2006 = 556**

IBM System x3650 M4 HD  
(Intel Xeon E5-2650 v2, 2.60 GHz)

**SPECfp\_rate\_base2006 = 543**

**CPU2006 license:** 11  
**Test sponsor:** IBM Corporation  
**Tested by:** IBM Corporation

**Test date:** Oct-2013  
**Hardware Availability:** Dec-2013  
**Software Availability:** Sep-2013

## Peak Optimization Flags (Continued)

416.gamess: -xAVX(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: -xAVX -ipo -O3 -no-prec-div -opt-prefetch

459.GemsFDTD: basepeak = yes

465.tonto: -xAVX(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)  
-no-prec-div(pass 2) -prof-use(pass 2) -unroll4 -auto  
-inline-calloc -opt-malloc-options=3

Benchmarks using both Fortran and C:

435.gromacs: -xAVX(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)  
-no-prec-div(pass 2) -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: -xAVX -ipo -O3 -no-prec-div -auto-ilp32

The flags files that were used to format this result can be browsed at

<http://www.spec.org/cpu2006/flags/Intel-ic14.0-official-linux64.20140128.html>  
<http://www.spec.org/cpu2006/flags/IBM-Platform-Flags-V1.2-IVB-A.html>

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

<http://www.spec.org/cpu2006/flags/Intel-ic14.0-official-linux64.20140128.xml>  
<http://www.spec.org/cpu2006/flags/IBM-Platform-Flags-V1.2-IVB-A.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 Thu Jul 24 19:36:18 2014 by SPEC CPU2006 PS/PDF formatter v6932.  
Originally published on 17 December 2013.