



# SPEC® CFP2006 Result

Copyright 2006-2016 Standard Performance Evaluation Corporation

Hewlett Packard Enterprise

(Test Sponsor: HPE)

Synergy 480 Gen9  
(3.20 GHz, Intel Xeon E5-2667 v4)

SPECfp®\_rate2006 = 757

SPECfp\_rate\_base2006 = 737

CPU2006 license: 3

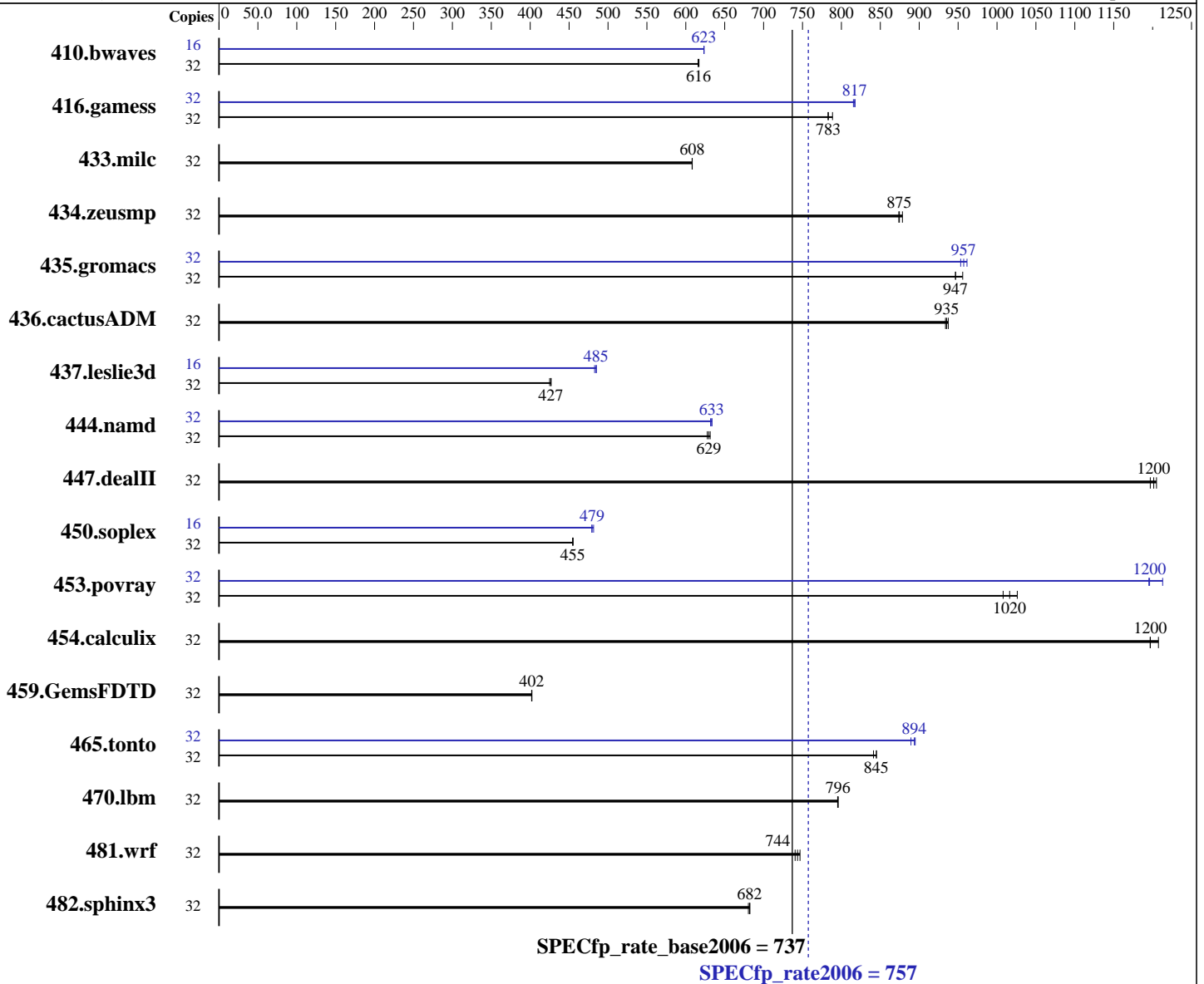
Test sponsor: HPE

Tested by: HPE

Test date: Oct-2016

Hardware Availability: Dec-2016

Software Availability: Sep-2016



## Hardware

CPU Name: Intel Xeon E5-2667 v4  
 CPU Characteristics: Intel Turbo Boost Technology up to 3.60 GHz  
 CPU MHz: 3200  
 FPU: Integrated  
 CPU(s) enabled: 16 cores, 2 chips, 8 cores/chip, 2 threads/core  
 CPU(s) orderable: 1,2 chip  
 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 (x86\_64) SP1, Kernel 3.12.49-11-default  
 Compiler: C/C++: Version 17.0.0.098 of Intel C++ Studio XE for Linux;  
 Fortran: Version 17.0.0.098 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

Hewlett Packard Enterprise

(Test Sponsor: HPE)

Synergy 480 Gen9

(3.20 GHz, Intel Xeon E5-2667 v4)

SPECfp\_rate2006 = 757

SPECfp\_rate\_base2006 = 737

CPU2006 license: 3

Test sponsor: HPE

Tested by: HPE

Test date: Oct-2016

Hardware Availability: Dec-2016

Software Availability: Sep-2016

L3 Cache: 25 MB I+D on chip per chip  
Other Cache: None  
Memory: 256 GB (16 x 16 GB 2Rx4 PC4-2400T-R)  
Disk Subsystem: 1 x 600 GB 10 K SAS, RAID 0  
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    | 32     | 705        | 617         | <b>706</b> | <b>616</b>  | 706        | 616        | 16     | 349        | 623         | <b>349</b> | <b>623</b>  | 349        | 623        |
| 416.gamess    | 32     | 800        | 783         | <b>800</b> | <b>783</b>  | 795        | 789        | 32     | 766        | 818         | 768        | 815         | <b>767</b> | <b>817</b> |
| 433.milc      | 32     | 483        | 608         | 483        | 608         | <b>483</b> | <b>608</b> | 32     | 483        | 608         | 483        | 608         | <b>483</b> | <b>608</b> |
| 434.zeusmp    | 32     | <b>333</b> | <b>875</b>  | 332        | 878         | 333        | 874        | 32     | <b>333</b> | <b>875</b>  | 332        | 878         | 333        | 874        |
| 435.gromacs   | 32     | 239        | 956         | 241        | 947         | <b>241</b> | <b>947</b> | 32     | <b>239</b> | <b>957</b>  | 240        | 953         | 238        | 961        |
| 436.cactusADM | 32     | <b>409</b> | <b>935</b>  | 408        | 937         | 410        | 934        | 32     | <b>409</b> | <b>935</b>  | 408        | 937         | 410        | 934        |
| 437.leslie3d  | 32     | 708        | 425         | <b>705</b> | <b>427</b>  | 705        | 427        | 16     | <b>310</b> | <b>485</b>  | 312        | 483         | 310        | 485        |
| 444.namd      | 32     | 406        | 631         | 409        | 628         | <b>408</b> | <b>629</b> | 32     | 405        | 634         | 406        | 632         | <b>405</b> | <b>633</b> |
| 447.dealII    | 32     | <b>305</b> | <b>1200</b> | 304        | 1200        | 306        | 1200       | 32     | <b>305</b> | <b>1200</b> | 304        | 1200        | 306        | 1200       |
| 450.soplex    | 32     | 586        | 455         | 587        | 455         | <b>587</b> | <b>455</b> | 16     | 278        | 479         | <b>278</b> | <b>479</b>  | 277        | 481        |
| 453.povray    | 32     | 169        | 1010        | <b>168</b> | <b>1020</b> | 166        | 1030       | 32     | 142        | 1200        | <b>142</b> | <b>1200</b> | 140        | 1210       |
| 454.calculix  | 32     | <b>221</b> | <b>1200</b> | 219        | 1210        | 221        | 1200       | 32     | <b>221</b> | <b>1200</b> | 219        | 1210        | 221        | 1200       |
| 459.GemsFDTD  | 32     | 844        | 402         | <b>844</b> | <b>402</b>  | 845        | 402        | 32     | 844        | 402         | <b>844</b> | <b>402</b>  | 845        | 402        |
| 465.tonto     | 32     | 373        | 845         | 374        | 841         | <b>373</b> | <b>845</b> | 32     | 352        | 895         | 354        | 889         | <b>352</b> | <b>894</b> |
| 470.lbm       | 32     | <b>553</b> | <b>796</b>  | 553        | 796         | 553        | 795        | 32     | <b>553</b> | <b>796</b>  | 553        | 796         | 553        | 795        |
| 481.wrf       | 32     | 483        | 741         | <b>481</b> | <b>744</b>  | 479        | 747        | 32     | 483        | 741         | <b>481</b> | <b>744</b>  | 479        | 747        |
| 482.sphinx3   | 32     | 917        | 680         | 914        | 682         | <b>914</b> | <b>682</b> | 32     | 917        | 680         | 914        | 682         | <b>914</b> | <b>682</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"  
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>



# SPEC CFP2006 Result

Copyright 2006-2016 Standard Performance Evaluation Corporation

**Hewlett Packard Enterprise**

(Test Sponsor: HPE)

**Synergy 480 Gen9**

(3.20 GHz, Intel Xeon E5-2667 v4)

**SPECfp\_rate2006 = 757**

**SPECfp\_rate\_base2006 = 737**

**CPU2006 license:** 3

**Test sponsor:** HPE

**Tested by:** HPE

**Test date:** Oct-2016

**Hardware Availability:** Dec-2016

**Software Availability:** Sep-2016

## Platform Notes

### BIOS Configuration:

```

Power Profile set to Custom
Power Regulator to 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
Energy/Performance Bias set to Maximum Performance
Collaborative Power Control set to Disabled
QPI Snoop Configuration set to Home Snoop
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.rev6993
Revision 6993 of 2015-11-06 (b5e8d4b4eb51ed28d7f98696cbe290c1)
running on linux-xxgs Wed Oct 26 22:43:24 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 E5-2667 v4 @ 3.20GHz
 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 2 3 4 8 10 11 12
  physical 1: cores 0 2 3 4 8 10 11 12
cache size : 25600 KB

```

### From /proc/meminfo

```

MemTotal:      264547760 kB
HugePages_Total:      0
Hugepagesize:    2048 kB

```

### /usr/bin/lsb\_release -d

```
SUSE Linux Enterprise Server 12 SP1
```

### 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"

```

Continued on next page



# SPEC CFP2006 Result

Copyright 2006-2016 Standard Performance Evaluation Corporation

**Hewlett Packard Enterprise**

(Test Sponsor: HPE)

Synergy 480 Gen9  
(3.20 GHz, Intel Xeon E5-2667 v4)

**SPECfp\_rate2006 = 757**

**SPECfp\_rate\_base2006 = 737**

**CPU2006 license:** 3

**Test sponsor:** HPE

**Tested by:** HPE

**Test date:** Oct-2016

**Hardware Availability:** Dec-2016

**Software Availability:** Sep-2016

## Platform Notes (Continued)

```
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 linux-xxgs 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 Oct 26 14:07
```

```
SPEC is set to: /home/cpu2006
Filesystem      Type  Size  Used Avail Use% Mounted on
/dev/sda4       xfs   424G   78G  346G  19% /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 HP I37 09/14/2016
Memory:
8x UNKNOWN NOT AVAILABLE
16x UNKNOWN NOT AVAILABLE 16 GB 2 rank 2400 MHz
```

(End of data from sysinfo program)  
Regarding the sysinfo display about the memory installed, the correct amount of memory is 256 GB and the dmidecode description should have one line reading as:  
16x UNKNOWN NOT AVAILABLE 16 GB 2 rank 2400 MHz

## General Notes

Environment variables set by runspec before the start of the run:  
LD\_LIBRARY\_PATH = "/home/cpu2006/libs/32:/home/cpu2006/libs/64:/home/cpu2006/sh10.2"

Binaries compiled on a system with 1x Intel Core i7-4790 CPU + 32GB RAM  
memory using Redhat Enterprise Linux 7.2

## Base Compiler Invocation

C benchmarks:  
icc -m64

C++ benchmarks:  
icpc -m64

Continued on next page



# SPEC CFP2006 Result

Copyright 2006-2016 Standard Performance Evaluation Corporation

**Hewlett Packard Enterprise**

(Test Sponsor: HPE)

Synergy 480 Gen9

(3.20 GHz, Intel Xeon E5-2667 v4)

**SPECfp\_rate2006 = 757**

**SPECfp\_rate\_base2006 = 737**

**CPU2006 license:** 3

**Test sponsor:** HPE

**Tested by:** HPE

**Test date:** Oct-2016

**Hardware Availability:** Dec-2016

**Software Availability:** Sep-2016

## Base Compiler Invocation (Continued)

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  
 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 -qopt-prefetch -auto-p32  
-qopt-mem-layout-trans=3

C++ benchmarks:

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

Fortran benchmarks:

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

Benchmarks using both Fortran and C:

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



# SPEC CFP2006 Result

Copyright 2006-2016 Standard Performance Evaluation Corporation

**Hewlett Packard Enterprise**

(Test Sponsor: HPE)

Synergy 480 Gen9  
(3.20 GHz, Intel Xeon E5-2667 v4)

**SPECfp\_rate2006 = 757**

**SPECfp\_rate\_base2006 = 737**

**CPU2006 license:** 3

**Test sponsor:** HPE

**Tested by:** HPE

**Test date:** Oct-2016

**Hardware Availability:** Dec-2016

**Software Availability:** Sep-2016

## 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\_2017/linux/lib/ia32

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.deallI: -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:

Continued on next page



# SPEC CFP2006 Result

Copyright 2006-2016 Standard Performance Evaluation Corporation

**Hewlett Packard Enterprise**

(Test Sponsor: HPE)

Synergy 480 Gen9

(3.20 GHz, Intel Xeon E5-2667 v4)

**SPECfp\_rate2006 = 757**

**SPECfp\_rate\_base2006 = 737**

**CPU2006 license:** 3

**Test sponsor:** HPE

**Tested by:** HPE

**Test date:** Oct-2016

**Hardware Availability:** Dec-2016

**Software Availability:** Sep-2016

## Peak Optimization Flags (Continued)

444.namd: -prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX2(pass 2)  
-par-num-threads=1(pass 1) -ipo(pass 2) -O3(pass 2)  
-no-prec-div(pass 2) -fno-alias -auto-ilp32  
-qopt-mem-layout-trans=3

447.dealII: basepeak = yes

450.soplex: -prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX2(pass 2)  
-par-num-threads=1(pass 1) -ipo(pass 2) -O3(pass 2)  
-no-prec-div(pass 2) -qopt-malloc-options=3  
-qopt-mem-layout-trans=3

453.povray: -prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX2(pass 2)  
-par-num-threads=1(pass 1) -ipo(pass 2) -O3(pass 2)  
-no-prec-div(pass 2) -unroll4 -qopt-mem-layout-trans=3

### Fortran benchmarks:

410.bwaves: -xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch

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

434.zeusmp: basepeak = yes

437.leslie3d: Same as 410.bwaves

459.GemsFDTD: basepeak = yes

465.tonto: -prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX2(pass 2)  
-par-num-threads=1(pass 1) -ipo(pass 2) -O3(pass 2)  
-no-prec-div(pass 2) -unroll4 -auto -inline-calloc  
-qopt-malloc-options=3

### Benchmarks using both Fortran and C:

435.gromacs: -prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX2(pass 2)  
-par-num-threads=1(pass 1) -qopt-prefetch -auto-ilp32  
-qopt-mem-layout-trans=3

436.cactusADM: basepeak = yes

454.calculix: basepeak = yes

481.wrf: basepeak = yes



# SPEC CFP2006 Result

Copyright 2006-2016 Standard Performance Evaluation Corporation

**Hewlett Packard Enterprise**

(Test Sponsor: HPE)

**Synergy 480 Gen9**

(3.20 GHz, Intel Xeon E5-2667 v4)

**SPECfp\_rate2006 = 757**

**SPECfp\_rate\_base2006 = 737**

**CPU2006 license:** 3

**Test sponsor:** HPE

**Tested by:** HPE

**Test date:** Oct-2016

**Hardware Availability:** Dec-2016

**Software Availability:** Sep-2016

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/Intel-ic17.0-official-linux64.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/Intel-ic17.0-official-linux64.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 Nov 15 16:08:13 2016 by SPEC CPU2006 PS/PDF formatter v6932.  
Originally published on 15 November 2016.