



# SPEC® CFP2006 Result

Copyright 2006-2016 Standard Performance Evaluation Corporation

**Hewlett Packard Enterprise**

(Test Sponsor: HPE)

**ProLiant DL580 Gen9**

(2.10 GHz, Intel Xeon E7-4850 v4)

**SPECfp®\_rate2006 = 1740**

**SPECfp\_rate\_base2006 = 1700**

**CPU2006 license:** 3

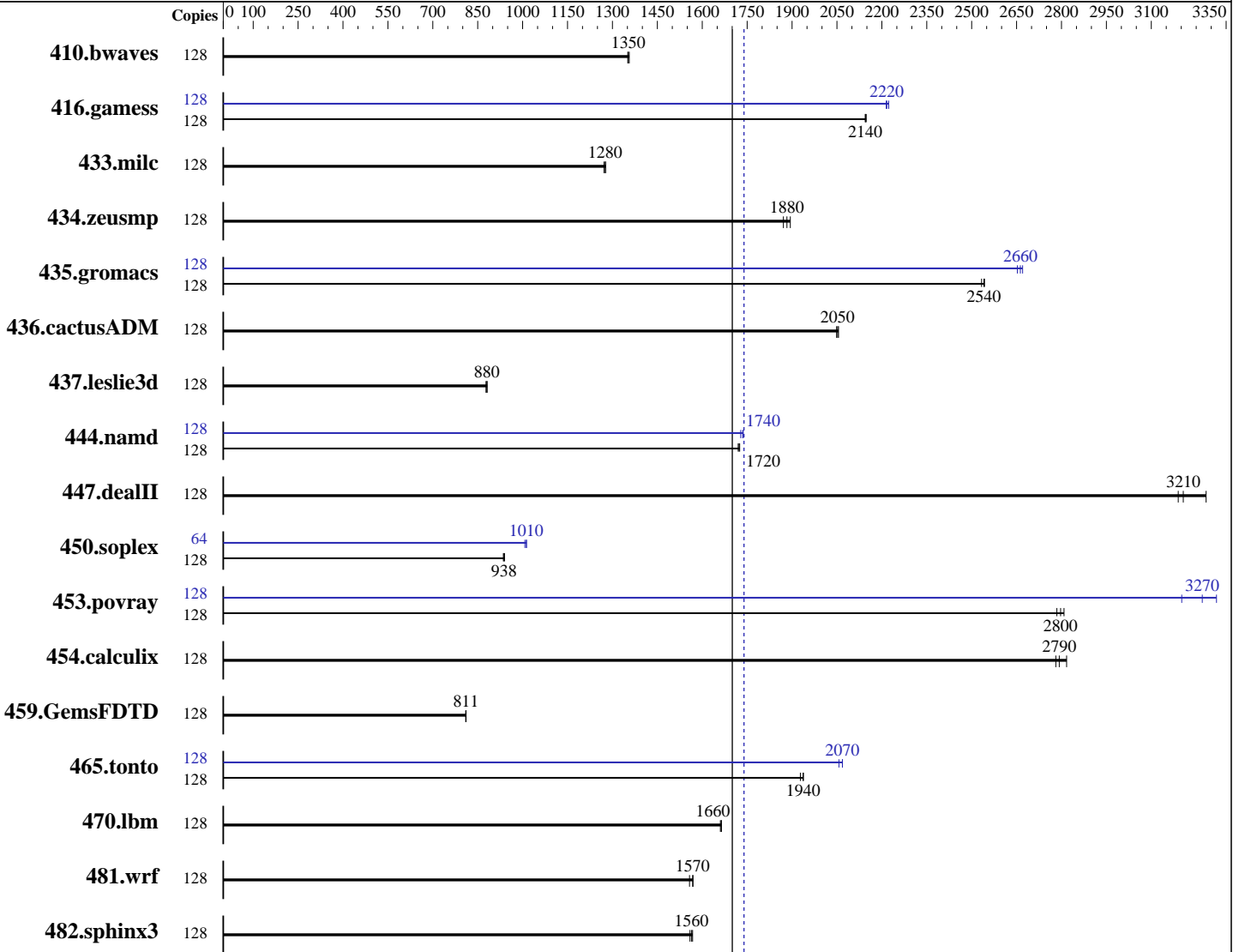
**Test sponsor:** HPE

**Tested by:** HPE

**Test date:** Jun-2016

**Hardware Availability:** Jun-2016

**Software Availability:** Dec-2015



**SPECfp\_rate\_base2006 = 1700**

**SPECfp\_rate2006 = 1740**

### Hardware

**CPU Name:** Intel Xeon E7-4850 v4  
**CPU Characteristics:** Intel Turbo Boost Technology up to 2.80 GHz  
**CPU MHz:** 2100  
**FPU:** Integrated  
**CPU(s) enabled:** 64 cores, 4 chips, 16 cores/chip, 2 threads/core  
**CPU(s) orderable:** 2,4 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 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

Hewlett Packard Enterprise

(Test Sponsor: HPE)

ProLiant DL580 Gen9

(2.10 GHz, Intel Xeon E7-4850 v4)

SPECfp\_rate2006 = 1740

SPECfp\_rate\_base2006 = 1700

CPU2006 license: 3

Test sponsor: HPE

Tested by: HPE

Test date: Jun-2016

Hardware Availability: Jun-2016

Software Availability: Dec-2015

L3 Cache: 40 MB I+D on chip per chip  
Other Cache: None  
Memory: 512 GB (32 x 16 GB 2Rx4 PC4-2400T-R, running at 1333 MHz)  
Disk Subsystem: 1 x 800 GB NVMe PCIe SSD, RAID 0  
Other Hardware: DL580 Gen9 NVMe SSD Express Bay Enablement Kit

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	128	1283	1360	1287	1350	<b><u>1285</u></b>	<b><u>1350</u></b>	128	1283	1360	1287	1350	<b><u>1285</u></b>	<b><u>1350</u></b>
416.gamess	128	1168	2140	1167	2150	<b><u>1168</u></b>	<b><u>2140</u></b>	128	1127	2220	<b><u>1131</u></b>	<b><u>2220</u></b>	1132	2210
433.milc	128	924	1270	920	1280	<b><u>921</u></b>	<b><u>1280</u></b>	128	924	1270	920	1280	<b><u>921</u></b>	<b><u>1280</u></b>
434.zeusmp	128	<b><u>619</u></b>	<b><u>1880</u></b>	623	1870	615	1890	128	<b><u>619</u></b>	<b><u>1880</u></b>	623	1870	615	1890
435.gromacs	128	361	2530	359	2540	<b><u>360</u></b>	<b><u>2540</u></b>	128	342	2670	<b><u>343</u></b>	<b><u>2660</u></b>	345	2650
436.cactusADM	128	747	2050	744	2060	<b><u>745</u></b>	<b><u>2050</u></b>	128	747	2050	744	2060	<b><u>745</u></b>	<b><u>2050</u></b>
437.leslie3d	128	1371	878	<b><u>1367</u></b>	<b><u>880</u></b>	1365	881	128	1371	878	<b><u>1367</u></b>	<b><u>880</u></b>	1365	881
444.namd	128	595	1730	<b><u>596</u></b>	<b><u>1720</u></b>	597	1720	128	591	1740	<b><u>592</u></b>	<b><u>1740</u></b>	594	1730
447.dealII	128	<b><u>457</u></b>	<b><u>3210</u></b>	446	3280	459	3190	128	<b><u>457</u></b>	<b><u>3210</u></b>	446	3280	459	3190
450.soplex	128	1136	940	1141	936	<b><u>1139</u></b>	<b><u>938</u></b>	64	530	1010	<b><u>527</u></b>	<b><u>1010</u></b>	527	1010
453.povray	128	<b><u>243</u></b>	<b><u>2800</u></b>	245	2780	242	2810	128	213	3200	205	3320	<b><u>208</u></b>	<b><u>3270</u></b>
454.calculix	128	<b><u>378</u></b>	<b><u>2790</u></b>	380	2780	375	2820	128	<b><u>378</u></b>	<b><u>2790</u></b>	380	2780	375	2820
459.GemsFDTD	128	1674	811	<b><u>1675</u></b>	<b><u>811</u></b>	1677	810	128	1674	811	<b><u>1675</u></b>	<b><u>811</u></b>	1677	810
465.tonto	128	<b><u>650</u></b>	<b><u>1940</u></b>	653	1930	650	1940	128	612	2060	<b><u>609</u></b>	<b><u>2070</u></b>	609	2070
470.lbm	128	1059	1660	<b><u>1057</u></b>	<b><u>1660</u></b>	1057	1660	128	1059	1660	<b><u>1057</u></b>	<b><u>1660</u></b>	1057	1660
481.wrf	128	918	1560	<b><u>912</u></b>	<b><u>1570</u></b>	911	1570	128	918	1560	<b><u>912</u></b>	<b><u>1570</u></b>	911	1570
482.sphinx3	128	1591	1570	1600	1560	<b><u>1595</u></b>	<b><u>1560</u></b>	128	1591	1570	1600	1560	<b><u>1595</u></b>	<b><u>1560</u></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)

ProLiant DL580 Gen9

(2.10 GHz, Intel Xeon E7-4850 v4)

SPECfp\_rate2006 = 1740

SPECfp\_rate\_base2006 = 1700

CPU2006 license: 3

Test sponsor: HPE

Tested by: HPE

Test date: Jun-2016

Hardware Availability: Jun-2016

Software Availability: Dec-2015

## Platform Notes

### BIOS Configuration:

HP Power Profile set to Custom  
 HP 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 Cluster On Die  
 Collaborative Power Control set to Disabled  
 Thermal Configuration set to Maximum Cooling  
 Processor Power and Utilization Monitoring set to Disabled

Sysinfo program /home/intel\_binary/cpu2006/config/sysinfo.rev6914  
 \$Rev: 6914 \$ \$Date:: 2014-06-25 #\$ e3fbb8667b5a285932ceab81e28219e1  
 running on linux-vi0i Sun Jun 26 15:28:01 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 E7-4850 v4 @ 2.10GHz
 4 "physical id"s (chips)
 128 "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 : 16
  siblings  : 32
 physical 0: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
 physical 1: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
 physical 2: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
 physical 3: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
cache size : 20480 KB
```

### From /proc/meminfo

```
MemTotal:      529310644 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"
```

Continued on next page



# SPEC CFP2006 Result

Copyright 2006-2016 Standard Performance Evaluation Corporation

**Hewlett Packard Enterprise**

(Test Sponsor: HPE)

**ProLiant DL580 Gen9**

(2.10 GHz, Intel Xeon E7-4850 v4)

**SPECfp\_rate2006 = 1740**

**SPECfp\_rate\_base2006 = 1700**

**CPU2006 license:** 3

**Test sponsor:** HPE

**Tested by:** HPE

**Test date:** Jun-2016

**Hardware Availability:** Jun-2016

**Software Availability:** Dec-2015

## Platform Notes (Continued)

ANSI\_COLOR="0;32"

CPE\_NAME="cpe:/o:suse:sles:12:sp1"

uname -a:

```
Linux linux-vi0i 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 24 15:11

SPEC is set to: /home/intel\_binary/cpu2006

```
Filesystem      Type  Size  Used Avail Use% Mounted on
/dev/nvme0n1p4 xfs   703G   35G  669G   5% /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 U17 05/16/2016

Memory:

64x UNKNOWN NOT AVAILABLE

32x UNKNOWN NOT AVAILABLE 16 GB 2 rank 2400 MHz, configured at 1333 MHz

(End of data from sysinfo program)

Regarding the sysinfo display about the memory installed, the correct amount of memory is 512 GB and the dmidecode description should have one line reading as:  
32x UNKNOWN NOT AVAILABLE 16 GB 2 rank 2400 MHz, configured at 1333 MHz

## General Notes

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

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

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

## Base 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 4



# SPEC CFP2006 Result

Copyright 2006-2016 Standard Performance Evaluation Corporation

Hewlett Packard Enterprise

(Test Sponsor: HPE)

ProLiant DL580 Gen9

(2.10 GHz, Intel Xeon E7-4850 v4)

SPECfp\_rate2006 = 1740

SPECfp\_rate\_base2006 = 1700

CPU2006 license: 3

Test sponsor: HPE

Tested by: HPE

Test date: Jun-2016

Hardware Availability: Jun-2016

Software Availability: Dec-2015

## Base Compiler Invocation (Continued)

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 -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

Continued on next page



# SPEC CFP2006 Result

Copyright 2006-2016 Standard Performance Evaluation Corporation

Hewlett Packard Enterprise

(Test Sponsor: HPE)

ProLiant DL580 Gen9

(2.10 GHz, Intel Xeon E7-4850 v4)

SPECfp\_rate2006 = 1740

SPECfp\_rate\_base2006 = 1700

CPU2006 license: 3

Test sponsor: HPE

Tested by: HPE

Test date: Jun-2016

Hardware Availability: Jun-2016

Software Availability: Dec-2015

## Peak Compiler Invocation (Continued)

C++ benchmarks (except as noted below):

icpc -m64

450.soplex: icpc -m32 -L/opt/intel/compilers\_and\_libraries\_2016/linux/compiler/lib/ia32\_lin

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:

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

Continued on next page



# SPEC CFP2006 Result

Copyright 2006-2016 Standard Performance Evaluation Corporation

Hewlett Packard Enterprise

(Test Sponsor: HPE)

ProLiant DL580 Gen9

(2.10 GHz, Intel Xeon E7-4850 v4)

SPECfp\_rate2006 = 1740

SPECfp\_rate\_base2006 = 1700

CPU2006 license: 3

Test sponsor: HPE

Tested by: HPE

Test date: Jun-2016

Hardware Availability: Jun-2016

Software Availability: Dec-2015

## Peak Optimization Flags (Continued)

447.dealII: basepeak = yes

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



# SPEC CFP2006 Result

Copyright 2006-2016 Standard Performance Evaluation Corporation

**Hewlett Packard Enterprise**

(Test Sponsor: HPE)

**ProLiant DL580 Gen9**

(2.10 GHz, Intel Xeon E7-4850 v4)

**SPECfp\_rate2006 = 1740**

**SPECfp\_rate\_base2006 = 1700**

**CPU2006 license:** 3

**Test sponsor:** HPE

**Tested by:** HPE

**Test date:** Jun-2016

**Hardware Availability:** Jun-2016

**Software Availability:** Dec-2015

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/HP-Platform-Flags-Intel-V1.2-HSW-revE.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/HP-Platform-Flags-Intel-V1.2-HSW-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 Jul 12 11:03:29 2016 by SPEC CPU2006 PS/PDF formatter v6932.  
Originally published on 12 July 2016.