



# SPEC® CFP2006 Result

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## Hewlett-Packard Company

SPECfp®\_rate2006 = 1580

ProLiant DL580 Gen8  
(2.30 GHz, Intel Xeon E7-4870 v2)

SPECfp\_rate\_base2006 = 1550

CPU2006 license: 3

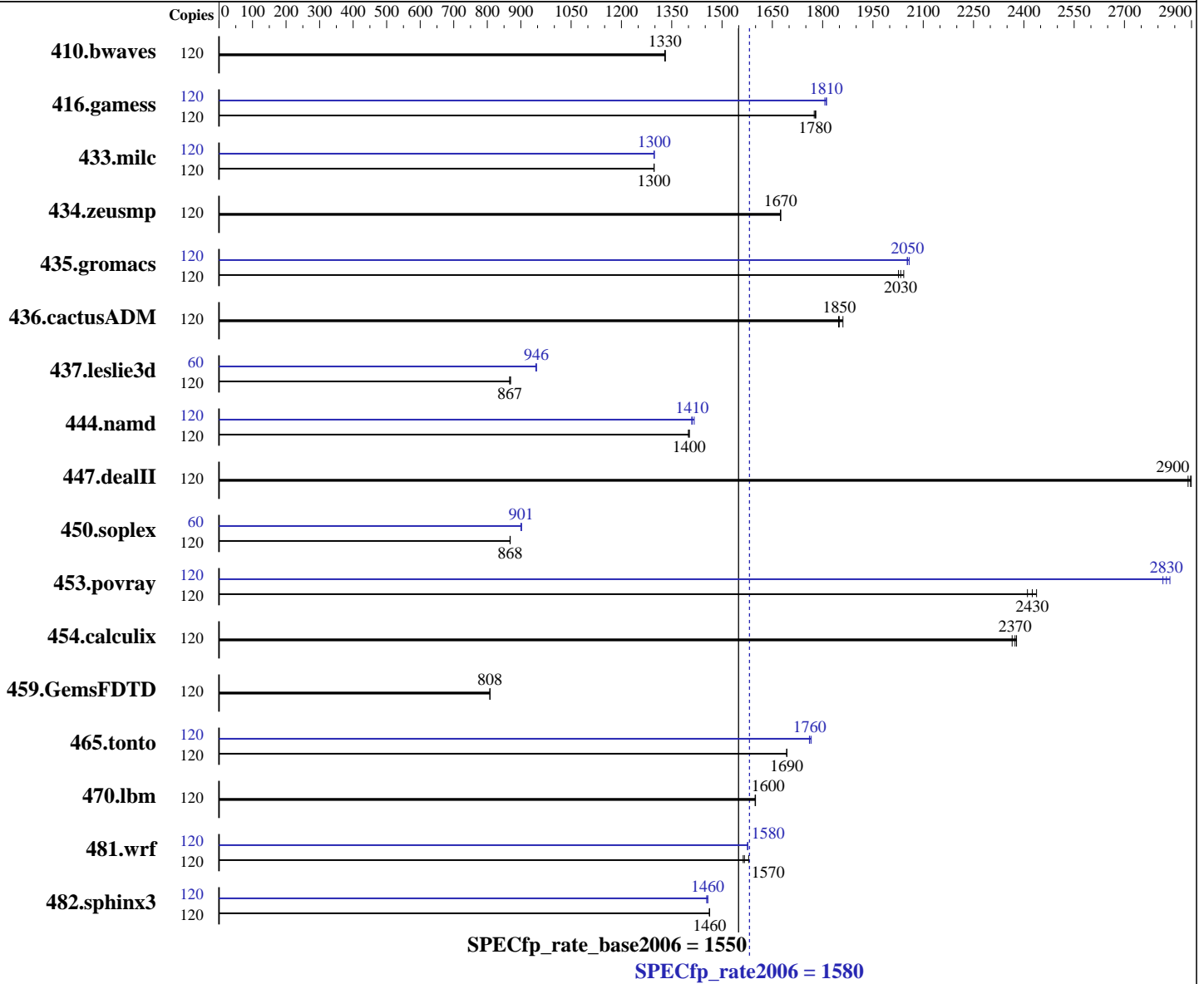
Test date: Apr-2014

Test sponsor: Hewlett-Packard Company

Hardware Availability: Feb-2014

Tested by: Hewlett-Packard Company

Software Availability: Nov-2013



### Hardware

CPU Name: Intel Xeon E7-4870 v2  
 CPU Characteristics: Intel Turbo Boost Technology up to 2.90 GHz  
 CPU MHz: 2300  
 FPU: Integrated  
 CPU(s) enabled: 60 cores, 4 chips, 15 cores/chip, 2 threads/core  
 CPU(s) orderable: 2,4 chips  
 Primary Cache: 32 KB I + 32 KB D on chip per core  
 Secondary Cache: 256 KB I+D on chip per core

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### Software

Operating System: Red Hat Enterprise Linux Server release 6.5, (Santiago)  
 Kernel 2.6.32-431.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

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L3 Cache: 30 MB I+D on chip per chip  
Other Cache: None  
Memory: 1 TB (64 x 16 GB 2Rx4 PC3-14900R-13, ECC, running at 1333 MHz and CL9)  
Disk Subsystem: 1 x 400 GB SSD SAS, 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	120	1227	1330	<u>1226</u>	<u>1330</u>	1225	1330	120	1227	1330	<u>1226</u>	<u>1330</u>	1225	1330
416.gamess	120	1320	1780	1324	1770	<u>1321</u>	<u>1780</u>	120	1301	1810	1297	1810	<u>1298</u>	<u>1810</u>
433.milc	120	849	1300	849	1300	<u>849</u>	<u>1300</u>	120	848	1300	<u>849</u>	<u>1300</u>	849	1300
434.zeusmp	120	652	1670	<u>652</u>	<u>1670</u>	652	1670	120	652	1670	<u>652</u>	<u>1670</u>	652	1670
435.gromacs	120	420	2040	423	2030	<u>421</u>	<u>2030</u>	120	416	2060	<u>417</u>	<u>2050</u>	418	2050
436.cactusADM	120	776	1850	<u>775</u>	<u>1850</u>	771	1860	120	776	1850	<u>775</u>	<u>1850</u>	771	1860
437.leslie3d	120	1301	867	1297	870	<u>1301</u>	<u>867</u>	60	<u>596</u>	<u>946</u>	596	947	597	945
444.namd	120	<u>686</u>	<u>1400</u>	686	1400	688	1400	120	<u>682</u>	<u>1410</u>	679	1420	683	1410
447.dealII	120	<u>474</u>	<u>2900</u>	475	2890	474	2900	120	<u>474</u>	<u>2900</u>	475	2890	474	2900
450.soplex	120	<u>1153</u>	<u>868</u>	1152	869	1153	868	60	<u>555</u>	<u>901</u>	555	902	556	900
453.povray	120	265	2410	<u>263</u>	<u>2430</u>	262	2440	120	225	2840	227	2810	<u>226</u>	<u>2830</u>
454.calculix	120	<u>417</u>	<u>2370</u>	419	2370	416	2380	120	<u>417</u>	<u>2370</u>	419	2370	416	2380
459.GemsFDTD	120	1576	808	<u>1576</u>	<u>808</u>	1576	808	120	1576	808	<u>1576</u>	<u>808</u>	1576	808
465.tonto	120	698	1690	697	1690	<u>697</u>	<u>1690</u>	120	669	1770	671	1760	<u>670</u>	<u>1760</u>
470.lbm	120	1031	1600	<u>1031</u>	<u>1600</u>	1031	1600	120	1031	1600	<u>1031</u>	<u>1600</u>	1031	1600
481.wrf	120	858	1560	<u>856</u>	<u>1570</u>	849	1580	120	851	1580	850	1580	<u>850</u>	<u>1580</u>
482.sphinx3	120	1598	1460	1600	1460	<u>1599</u>	<u>1460</u>	120	<u>1605</u>	<u>1460</u>	1605	1460	1608	1450

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/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>

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### Operating System Notes (Continued)

Disabled unused Linux services through "stop\_services.sh" before running.

### Platform Notes

#### BIOS Configuration:

HP Power Profile set to Maximum Performance  
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 Disabled

Sysinfo program /cpu2006/config/sysinfo.rev6818  
\$Rev: 6818 \$ \$Date:: 2012-07-17 #\$ e86d102572650a6e4d596a3cee98f191  
running on DL580-Gen8-SR Thu Apr 24 00:35:51 2014

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 E7-4870 v2 @ 2.30GHz
 4 "physical id"s (chips)
 120 "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 : 15
  siblings  : 30
  physical 0: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14
  physical 1: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14
  physical 2: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14
  physical 3: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14
cache size : 30720 KB
```

#### From /proc/meminfo

```
MemTotal: 1058653984 kB
HugePages_Total: 0
Hugepagesize: 2048 kB
```

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

```
Red Hat Enterprise Linux Server release 6.5 (Santiago)
```

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

```
redhat-release: Red Hat Enterprise Linux Server release 6.5 (Santiago)
system-release: Red Hat Enterprise Linux Server release 6.5 (Santiago)
system-release-cpe: cpe:/o:redhat:enterprise_linux:6server:ga:server
```

#### uname -a:

```
Linux DL580-Gen8-SR 2.6.32-431.el6.x86_64 #1 SMP Sun Nov 10 22:19:54 EST 2013
x86_64 x86_64 x86_64 GNU/Linux
```

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## Platform Notes (Continued)

run-level 3 Apr 23 10:25

SPEC is set to: /cpu2006

Filesystem	Type	Size	Used	Avail	Use%	Mounted on
/dev/sda3	ext4	365G	115G	233G	33%	/

Additional information from dmidecode:

BIOS HP P79 02/21/2014

Memory:

64x HP 712383-081 16 GB 1333 MHz 2 rank

32x UNKNOWN NOT AVAILABLE

(End of data from sysinfo program)

Regarding the sysinfo display about the memory installed, the correct amount of memory is 1 TB and the dmidecode description should have one line reading as:

64x HP 712383-081 16 GB 1333 MHz 2 rank

## General Notes

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

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

Binaries compiled on a system with 1x Core i7-860 CPU + 8GB memory using RedHat EL 6.4

## 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

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## Base Portability Flags (Continued)

```

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:

```

-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 (except as noted below):

icc -m64

482.sphinx3: icc -m32

C++ benchmarks (except as noted below):

icpc -m64

450.soplex: icpc -m32

Fortran benchmarks:

ifort -m64

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## Peak Compiler Invocation (Continued)

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  
 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

## 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: -xAVX -ipo -O3 -no-prec-div -opt-mem-layout-trans=3  
 -unroll2

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

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## Peak Optimization Flags (Continued)

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

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/HP-Platform-Flags-Intel-V1.2-revD.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>

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For other inquiries, please contact [webmaster@spec.org](mailto:webmaster@spec.org).

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