SPEC® CFP2006 Result
Copyright 2006-2015 Standard Performance Evaluation Corporation

Hewlett-Packard Company

ProLiant DL580 Gen9
(2.30 GHz, Intel Xeon E7-8880 v3)

$SPECfp^{®}2006 =$ 116

$SPECfp\_base2006 =$ 109

CPU2006 license: 3
Test sponsor: Hewlett-Packard Company
Tested by: Hewlett-Packard Company

Test date: May-2015
Hardware Availability: May-2015
Software Availability: Mar-2015

Benchmark	Value(s)
410.bwaves	1310
416.gamess	39.5 / 32.8
433.milc	64.0 / 63.3
434.zeusmp	165
435.gromacs	34.5
436.cactusADM	1020
437.leslie3d	261
444.namd	26.9 / 26.2
447.dealII	50.5
450.soplex	42.5
453.povray	58.9 / 52.7
454.calculix	54.0 / 43.8
459.GemsFDTD	253 / 201
465.tonto	48.5 / 32.8
470.lbm	1710
481.wrf	106
482.sphinx3	65.7

SPECfp_base2006 = 109

SPECfp2006 = 116

Hardware

CPU Name: Intel Xeon E7-8880 v3
CPU Characteristics: Intel Turbo Boost Technology up to 3.10 GHz
CPU MHz: 2300
FPU: Integrated
CPU(s) enabled: 72 cores, 4 chips, 18 cores/chip
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: Red Hat Enterprise Linux Server release 7.1 (Maipo)
Kernel 3.10.0-229.el7.x86_64
Compiler: C/C++: Version 15.0.0.090 of Intel C++ Studio XE for Linux;
Fortran: Version 15.0.0.090 of Intel Fortran Studio XE for Linux
Auto Parallel: Yes
File System: xfs
Continued on next page

SPEC CFP2006 Result
Copyright 2006-2015 Standard Performance Evaluation Corporation

Hewlett-Packard Company

ProLiant DL580 Gen9
(2.30 GHz, Intel Xeon E7-8880 v3)

$SPECfp2006 = 116$

$SPECfp\_base2006 = 109$

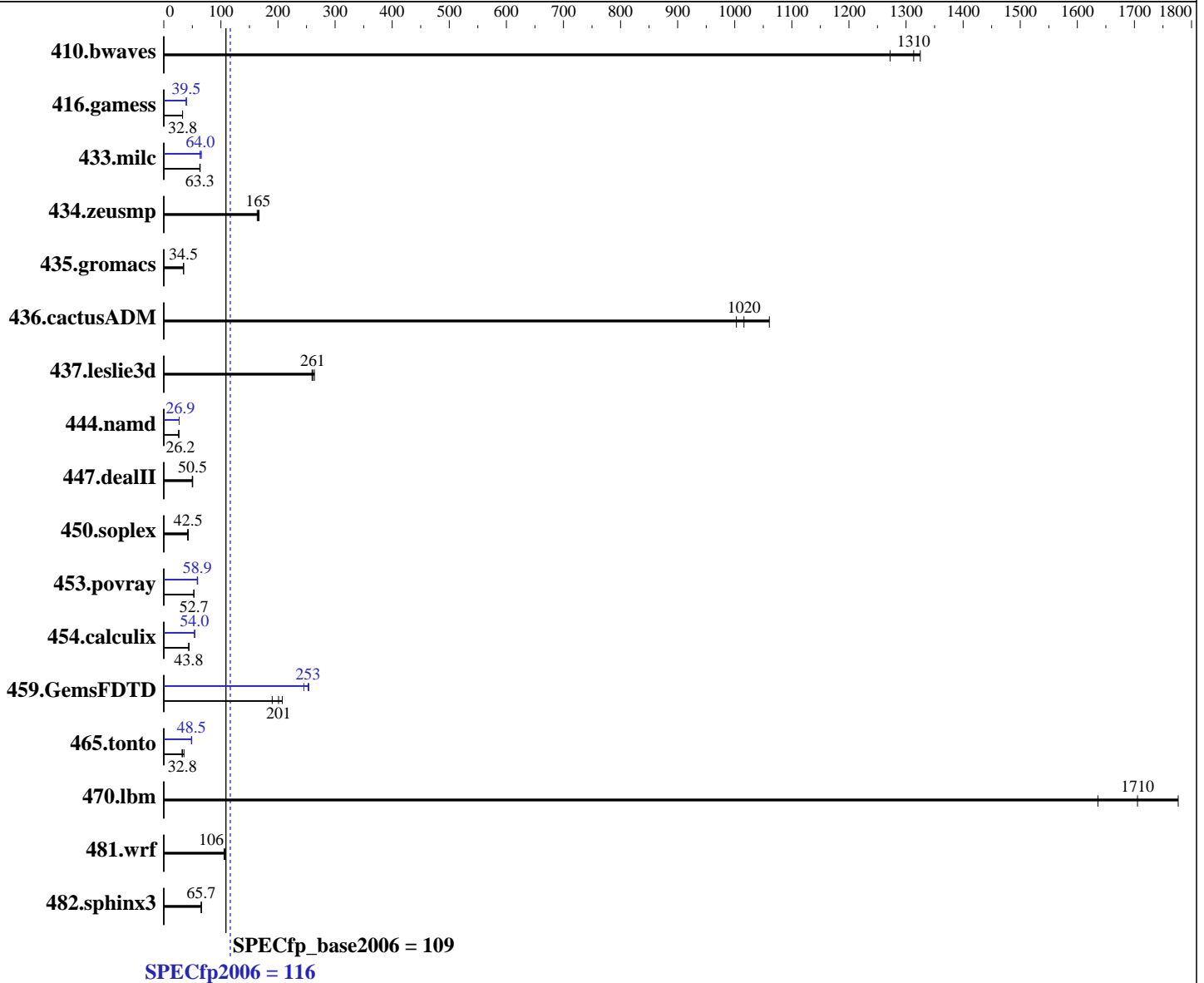|	
CPU2006 license: 3	**Test date:** May-2015
Test sponsor: Hewlett-Packard Company	**Hardware Availability:** May-2015
Tested by: Hewlett-Packard Company	**Software Availability:** Mar-2015

L3 Cache:	45 MB I+D on chip per chip	System State:	Run level 3 (multi-user)
Other Cache:	None	Base Pointers:	64-bit
Memory:	512 GB (32 x 16 GB 2Rx4 PC4-2133P-R, running at 1600 MHz)	Peak Pointers:	32/64-bit
		Other Software:	None
Disk Subsystem:	1 x 400 GB SAS SSD, RAID 0		
Other Hardware:	None		

Results Table

Benchmark	Base Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Peak Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	10.3	1320	**10.3**	**1310**	10.7	1270	10.3	1320	**10.3**	**1310**	10.7	1270
416.gamess	**596**	**32.8**	597	32.8	596	32.9	496	39.5	498	39.3	**496**	**39.5**
433.milc	146	63.1	144	63.7	**145**	**63.3**	**144**	**64.0**	140	65.7	144	63.7
434.zeusmp	54.5	167	**55.0**	**165**	55.6	164	54.5	167	**55.0**	**165**	55.6	164
435.gromacs	207	34.4	206	34.7	**207**	**34.5**	207	34.4	206	34.7	**207**	**34.5**
436.cactusADM	11.3	1060	**11.8**	**1020**	11.9	1000	11.3	1060	**11.8**	**1020**	11.9	1000
437.leslie3d	36.2	260	**36.0**	**261**	35.6	264	36.2	260	**36.0**	**261**	35.6	264
444.namd	306	26.2	**306**	**26.2**	306	26.2	298	26.9	298	26.9	**298**	**26.9**
447.dealII	230	49.8	227	50.5	**227**	**50.5**	230	49.8	227	50.5	**227**	**50.5**
450.soplex	200	41.7	195	42.8	**196**	**42.5**	200	41.7	195	42.8	**196**	**42.5**
453.povray	**101**	**52.7**	100	53.0	101	52.6	90.8	58.6	**90.4**	**58.9**	89.6	59.4
454.calculix	188	43.8	188	43.8	**188**	**43.8**	153	54.0	153	54.0	**153**	**54.0**
459.GemsFDTD	51.1	208	**52.8**	**201**	55.9	190	43.3	245	**42.0**	**253**	41.8	254
465.tonto	**300**	**32.8**	278	35.4	308	32.0	201	48.9	203	48.5	**203**	**48.5**
470.lbm	7.73	1780	8.40	1640	**8.06**	**1710**	7.73	1780	8.40	1640	**8.06**	**1710**
481.wrf	106	106	**105**	**106**	104	107	106	106	**105**	**106**	104	107
482.sphinx3	**297**	**65.7**	297	65.6	296	65.8	**297**	**65.7**	297	65.6	296	65.8

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

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
```

Platform Notes

```
    BIOS Configuration
      Intel Hyperthreading options set to Disabled
      Power Profile set to Custom
      Power Regulator set 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 Package C6 (retention) State
      Energy/Performance Bias set to Maximum Performance
```

Hewlett-Packard Company

ProLiant DL580 Gen9
(2.30 GHz, Intel Xeon E7-8880 v3)

$SPECfp2006 = $ 116

$SPECfp_base2006 = $ 109

CPU2006 license: 3
Test sponsor: Hewlett-Packard Company
Tested by: Hewlett-Packard Company

Test date: May-2015
Hardware Availability: May-2015
Software Availability: Mar-2015

Platform Notes (Continued)

```
    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 1x Refresh

  Sysinfo program /cpu2006/config/sysinfo.rev6914
  $Rev: 6914 $ $Date:: 2014-06-25 #$ e3fbb8667b5a285932ceab81e28219e1
  running on localhost.localdomain Tue May 12 18:50:22 2015

  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 E7-8880 v3 @ 2.30GHz
        4 "physical id"s (chips)
        72 "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 : 18
        siblings  : 18
        physical 0: cores 0 2 3 4 8 9 10 11 16 17 18 19 20 24 25 26 27
        physical 1: cores 0 2 3 4 8 9 10 11 16 17 18 19 20 24 25 26 27
        physical 2: cores 0 2 3 4 8 9 10 11 16 17 18 19 20 24 25 26 27
        physical 3: cores 0 2 3 4 8 9 10 11 16 17 18 19 20 24 25 26 27
     cache size : 46080 KB

  From /proc/meminfo
     MemTotal:       528072772 kB
     HugePages_Total:        0
     Hugepagesize:        2048 kB

  From /etc/*release* /etc/*version*
     os-release:
        NAME="Red Hat Enterprise Linux Server"
        VERSION="7.1 (Maipo)"
        ID="rhel"
        ID_LIKE="fedora"
        VERSION_ID="7.1"
        PRETTY_NAME="Red Hat Enterprise Linux Server 7.1 (Maipo)"
        ANSI_COLOR="0;31"
        CPE_NAME="cpe:/o:redhat:enterprise_linux:7.1:GA:server"
     redhat-release: Red Hat Enterprise Linux Server release 7.1 (Maipo)
     system-release: Red Hat Enterprise Linux Server release 7.1 (Maipo)
     system-release-cpe: cpe:/o:redhat:enterprise_linux:7.1:ga:server

  uname -a:
     Linux localhost.localdomain 3.10.0-229.el7.x86_64 #1 SMP Thu Jan 29 18:37:38
     EST 2015 x86_64 x86_64 x86_64 GNU/Linux

  run-level 3 May 12 18:45
```

SPEC CFP2006 Result
Copyright 2006-2015 Standard Performance Evaluation Corporation

Hewlett-Packard Company

ProLiant DL580 Gen9
(2.30 GHz, Intel Xeon E7-8880 v3)

$SPECfp2006 =$ 116

$SPECfp\_base2006 =$ 109

Platform Notes (Continued)

```
  SPEC is set to: /cpu2006
     Filesystem      Type   Size  Used Avail Use% Mounted on
     /dev/sda4       xfs   368G   52G  317G  14% /
  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 03/13/2015
     Memory:
      32x HP 752369-081 16 GB 2 rank 2133 MHz, configured at 1600 MHz
      64x UNKNOWN NOT AVAILABLE

   (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 HP 752369-081 16 GB 2 rank 2133 MHz, configured at 1600 MHz
```

General Notes

```
Environment variables set by runspec before the start of the run:
KMP_AFFINITY = "granularity=fine,compact"
LD_LIBRARY_PATH = "/cpu2006/libs/32:/cpu2006/libs/64:/cpu2006/sh"
OMP_NUM_THREADS = "72"

 Binaries compiled on a system with 1x Core i5-4670K CPU + 16GB
 memory using RedHat EL 7.0
```

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 2006-2015 Standard Performance Evaluation Corporation

Hewlett-Packard Company

ProLiant DL580 Gen9
(2.30 GHz, Intel Xeon E7-8880 v3)

$SPECfp2006 =$ 116

$SPECfp\_base2006 =$ 109

CPU2006 license: 3
Test sponsor: Hewlett-Packard Company
Tested by: Hewlett-Packard Company

Test date: May-2015
Hardware Availability: May-2015
Software Availability: Mar-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 -parallel -opt-prefetch
-ansi-alias
```

C++ benchmarks:
```
-xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch -ansi-alias
```

Fortran benchmarks:
```
-xCORE-AVX2 -ipo -O3 -no-prec-div -parallel -opt-prefetch
```

Benchmarks using both Fortran and C:
```
-xCORE-AVX2 -ipo -O3 -no-prec-div -parallel -opt-prefetch
-ansi-alias
```

Peak Compiler Invocation

C benchmarks:
```
icc    -m64
```

C++ benchmarks:
```
icpc   -m64
```

Fortran benchmarks:
```
ifort -m64
```

SPEC CFP2006 Result

Hewlett-Packard Company

ProLiant DL580 Gen9
(2.30 GHz, Intel Xeon E7-8880 v3)

$SPECfp2006 =$ 116

$SPECfp\_base2006 =$ 109

CPU2006 license: 3
Test sponsor: Hewlett-Packard Company
Tested by: Hewlett-Packard Company

Test date: May-2015
Hardware Availability: May-2015
Software Availability: Mar-2015

Peak Compiler Invocation (Continued)

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

Peak Portability Flags

```
Same as Base Portability Flags
```

Peak Optimization Flags

C benchmarks:

```
 433.milc: -xCORE-AVX2(pass 2) -prof-gen(pass 1) -ipo(pass 2)
           -O3(pass 2) -no-prec-div(pass 2) -prof-use(pass 2)
           -auto-ilp32 -ansi-alias
```

```
  470.lbm: basepeak = yes
```

```
482.sphinx3: basepeak = yes
```

C++ benchmarks:

```
 444.namd: -xCORE-AVX2(pass 2) -prof-gen(pass 1) -ipo(pass 2)
           -O3(pass 2) -no-prec-div(pass 2) -prof-use(pass 2)
           -fno-alias -auto-ilp32
```

```
447.dealII: basepeak = yes
```

```
450.soplex: basepeak = yes
```

```
453.povray: -xCORE-AVX2(pass 2) -prof-gen(pass 1) -ipo(pass 2)
            -O3(pass 2) -no-prec-div(pass 2) -prof-use(pass 2) -unroll4
            -ansi-alias
```

Fortran benchmarks:

```
410.bwaves: basepeak = yes
```

```
416.gamess: -xCORE-AVX2(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: basepeak = yes
```

Hewlett-Packard Company

ProLiant DL580 Gen9
(2.30 GHz, Intel Xeon E7-8880 v3)

SPECfp2006 =   116

SPECfp_base2006 =   109

CPU2006 license: 3	**Test date:** May-2015
Test sponsor: Hewlett-Packard Company	**Hardware Availability:** May-2015
Tested by: Hewlett-Packard Company	**Software Availability:** Mar-2015

Peak Optimization Flags (Continued)

459.GemsFDTD: `-xCORE-AVX2(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 -opt-prefetch -parallel`

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

Benchmarks using both Fortran and C:

435.gromacs: `basepeak = yes`

436.cactusADM: `basepeak = yes`

454.calculix: `-xCORE-AVX2 -ipo -O3 -no-prec-div -auto-ilp32 -ansi-alias`

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-ic15.0-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-ic15.0-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.

Tested with SPEC CPU2006 v1.2.
Report generated on Tue Jun 2 13:49:06 2015 by SPEC CPU2006 PS/PDF formatter v6932.
Originally published on 2 June 2015.