SPEC® CFP2006 Result

Copyright 2006-2015 Standard Performance Evaluation Corporation

Hewlett-Packard Company

ProLiant DL580 Gen9
(2.00 GHz, Intel Xeon E7-4809 v3)

$SPECfp®\_rate2006 = 892$

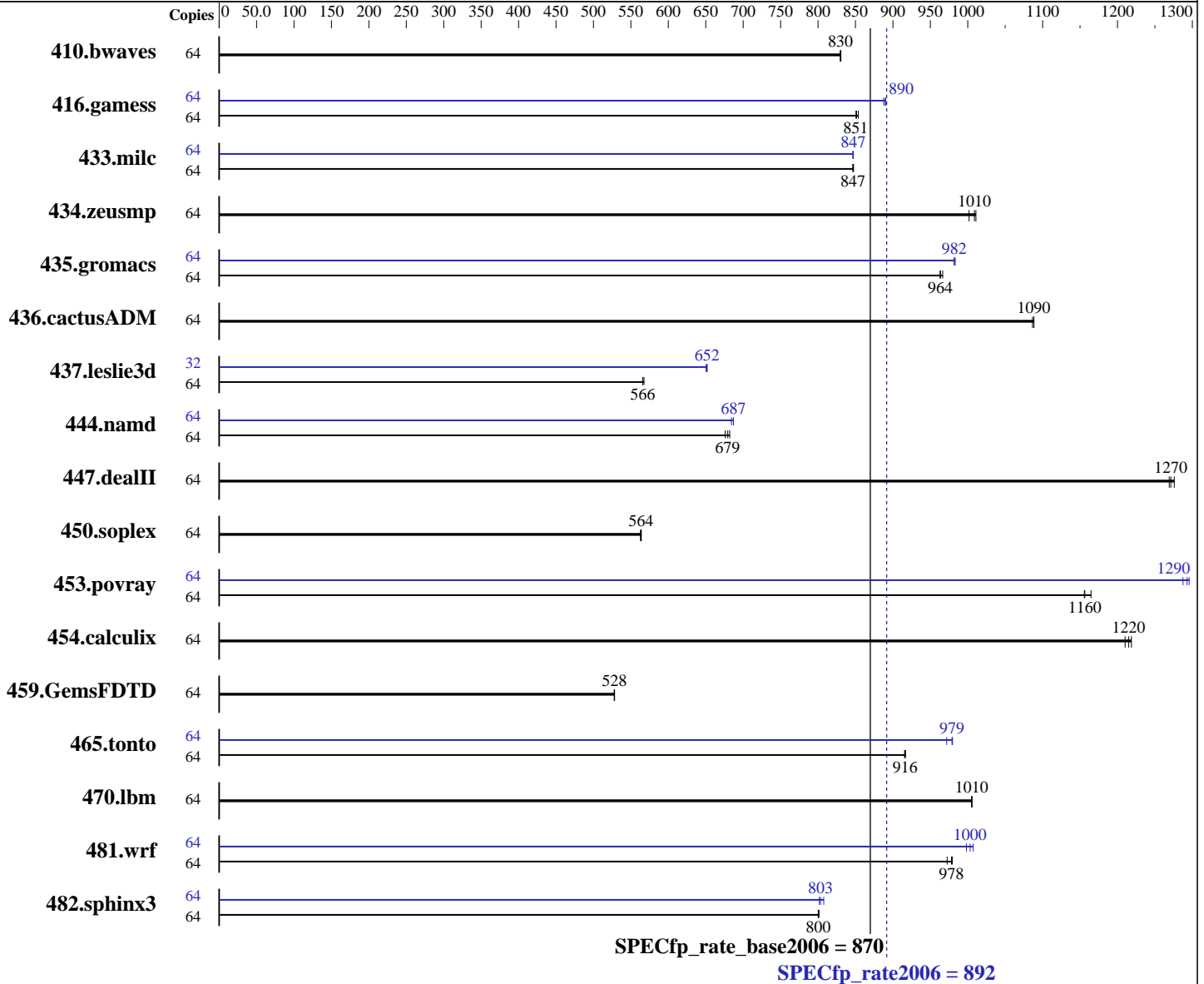$SPECfp\_rate\_base2006 = 870$

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

Test date: Jul-2015
Hardware Availability: Jun-2015
Software Availability: Oct-2014

SPECfp_rate_base2006 = 870

SPECfp_rate2006 = 892

Benchmark	Copies	Result
410.bwaves	64	830
416.gamess	64	890
416.gamess	64	851
433.milc	64	847
433.milc	64	847
434.zeusmp	64	1010
435.gromacs	64	982
435.gromacs	64	964
436.cactusADM	64	1090
437.leslie3d	32	652
437.leslie3d	64	566
444.namd	64	687
444.namd	64	679
447.dealII	64	1270
450.soplex	64	564
453.povray	64	1290
453.povray	64	1160
454.calculix	64	1220
459.GemsFDTD	64	528
465.tonto	64	979
465.tonto	64	916
470.lbm	64	1010
481.wrf	64	1000
481.wrf	64	978
482.sphinx3	64	803
482.sphinx3	64	800

Hardware

CPU Name: Intel Xeon E7-4809 v3
CPU Characteristics:
CPU MHz: 2000
FPU: Integrated
CPU(s) enabled: 32 cores, 4 chips, 8 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)
Kernel 3.12.28-4-default
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: No
File System: xfs
System State: Run level 3 (multi-user)

Continued on next page

SPEC CFP2006 Result
Copyright 2006-2015 Standard Performance Evaluation Corporation

Hewlett-Packard Company

ProLiant DL580 Gen9
(2.00 GHz, Intel Xeon E7-4809 v3)

$SPECfp\_rate2006 =$ 892

$SPECfp\_rate\_base2006 =$ 870

CPU2006 license: 3	**Test date:** Jul-2015
Test sponsor: Hewlett-Packard Company	**Hardware Availability:** Jun-2015
Tested by: Hewlett-Packard Company	**Software Availability:** Oct-2014

L3 Cache:	20 MB I+D on chip per chip	Base Pointers:	32/64-bit
Other Cache:	None	Peak Pointers:	32/64-bit
Memory:	512 GB (32 x 16 GB 2Rx4 PC4-2133P-R, running at 1333 MHz)	Other Software:	None
Disk Subsystem:	2 x 400 GB SAS SSD,RAID 1		
Other Hardware:	None		

Results Table

Benchmark	Base						Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	64	1048	830	1047	831	**1048**	**830**	64	1048	830	1047	831	**1048**	**830**
416.gamess	64	**1472**	**851**	1468	854	1473	851	64	1412	888	1407	890	**1408**	**890**
433.milc	64	693	847	694	846	**694**	**847**	64	694	846	**694**	**847**	693	847
434.zeusmp	64	**577**	**1010**	581	1000	576	1010	64	**577**	**1010**	581	1000	576	1010
435.gromacs	64	**474**	**964**	475	963	473	967	64	465	982	465	983	**465**	**982**
436.cactusADM	64	**703**	**1090**	704	1090	703	1090	64	**703**	**1090**	704	1090	703	1090
437.leslie3d	64	1063	566	1060	568	**1063**	**566**	32	463	650	461	652	**462**	**652**
444.namd	64	753	682	**755**	**679**	759	676	64	**747**	**687**	750	684	747	687
447.dealII	64	574	1280	**576**	**1270**	577	1270	64	574	1280	**576**	**1270**	577	1270
450.soplex	64	948	563	946	564	**947**	**564**	64	948	563	946	564	**947**	**564**
453.povray	64	292	1160	**294**	**1160**	295	1160	64	**263**	**1290**	263	1300	264	1290
454.calculix	64	**435**	**1220**	433	1220	436	1210	64	**435**	**1220**	433	1220	436	1210
459.GemsFDTD	64	1287	528	1286	528	**1286**	**528**	64	1287	528	1286	528	**1286**	**528**
465.tonto	64	**687**	**916**	687	917	688	916	64	**643**	**979**	643	980	648	972
470.lbm	64	875	1010	875	1010	**875**	**1010**	64	875	1010	875	1010	**875**	**1010**
481.wrf	64	**731**	**978**	735	972	730	979	64	**713**	**1000**	710	1010	716	998
482.sphinx3	64	**1559**	**800**	1557	801	1559	800	64	1544	808	**1553**	**803**	1556	802

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>

Hewlett-Packard Company

SPECfp_rate2006 = 892

ProLiant DL580 Gen9
(2.00 GHz, Intel Xeon E7-4809 v3)

SPECfp_rate_base2006 = 870

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

Test date: Jul-2015
Hardware Availability: Jun-2015
Software Availability: Oct-2014

Platform Notes

```
BIOS Configuration:
 HP Power Profile set to Custom
 HP Power Regulator to HP Static High Performance Mode
 Minimum Processor Idle Power Core State set to C6 State
 Energy/Performance Bias 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 1x Refresh
Sysinfo program /home/cpu2006/config/sysinfo.rev6914
$Rev: 6914 $ $Date:: 2014-06-25 #$ e3fbb8667b5a285932ceab81e28219e1
running on dl580gen9jks Tue Jul  7 02:20:19 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 E7-4809 v3 @ 2.00GHz
      4 "physical id"s (chips)
      64 "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
      physical 2: cores 0 1 2 3 4 5 6 7
      physical 3: cores 0 1 2 3 4 5 6 7
   cache size : 20480 KB

From /proc/meminfo
   MemTotal:       529318888 kB
   HugePages_Total:        0
   Hugepagesize:        2048 kB

/usr/bin/lsb_release -d
   SUSE Linux Enterprise Server 12

From /etc/*release* /etc/*version*
   SuSE-release:
      SUSE Linux Enterprise Server 12 (x86_64)
      VERSION = 12
      PATCHLEVEL = 0
      # 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"
      VERSION_ID="12"
```

Hewlett-Packard Company

SPECfp_rate2006 =   892

ProLiant DL580 Gen9
(2.00 GHz, Intel Xeon E7-4809 v3)

SPECfp_rate_base2006 =   870

CPU2006 license: 3		**Test date:**	Jul-2015
Test sponsor:	Hewlett-Packard Company	**Hardware Availability:**	Jun-2015
Tested by:	Hewlett-Packard Company	**Software Availability:**	Oct-2014

Platform Notes (Continued)

```
        PRETTY_NAME="SUSE Linux Enterprise Server 12"
        ID="sles"
        ANSI_COLOR="0;32"
        CPE_NAME="cpe:/o:suse:sles:12"

  uname -a:
     Linux dl580gen9jks 3.12.28-4-default #1 SMP Thu Sep 25 17:02:34 UTC 2014
     (9879bd4) x86_64 x86_64 x86_64 GNU/Linux

  run-level 3 Jul 6 10:39

  SPEC is set to: /home/cpu2006
     Filesystem      Type  Size  Used Avail Use% Mounted on
     /dev/sda4       xfs   331G  5.4G  325G   2% /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 03/13/2015
   Memory:
   32x HP 752369-081 16 GB 2 rank 2133 MHz, configured at 1333 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 1333 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/sh"

  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

Continued on next page

SPEC CFP2006 Result

Hewlett-Packard Company

ProLiant DL580 Gen9
(2.00 GHz, Intel Xeon E7-4809 v3)

$SPECfp\_rate2006 =$ 892

$SPECfp\_rate\_base2006 =$ 870

CPU2006 license: 3		**Test date:**	Jul-2015
Test sponsor:	Hewlett-Packard Company	**Hardware Availability:**	Jun-2015
Tested by:	Hewlett-Packard Company	**Software Availability:**	Oct-2014

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

Hewlett-Packard Company

ProLiant DL580 Gen9
(2.00 GHz, Intel Xeon E7-4809 v3)

SPECfp_rate2006 =   892

SPECfp_rate_base2006 =   870

CPU2006 license: 3	**Test date:** Jul-2015
Test sponsor: Hewlett-Packard Company	**Hardware Availability:** Jun-2015
Tested by: Hewlett-Packard Company	**Software Availability:** Oct-2014

Peak Compiler Invocation (Continued)

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

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

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)`
`-opt-mem-layout-trans=3(pass 2) -prof-use(pass 2)`
`-auto-ilp32`

470.lbm: `basepeak = yes`

482.sphinx3: `-xCORE-AVX2 -ipo -O3 -no-prec-div -opt-mem-layout-trans=3`
`-unroll2`

C++ benchmarks:

444.namd: `-xCORE-AVX2(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: `basepeak = yes`

453.povray: `-xCORE-AVX2(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:

Hewlett-Packard Company

ProLiant DL580 Gen9
(2.00 GHz, Intel Xeon E7-4809 v3)

$SPECfp\_rate2006 =$ 892

$SPECfp\_rate\_base2006 =$ 870

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

Test date: Jul-2015
Hardware Availability: Jun-2015
Software Availability: Oct-2014

Peak Optimization Flags (Continued)

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: -xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch

459.GemsFDTD: basepeak = yes

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) -unroll4
      -auto -inline-calloc -opt-malloc-options=3

Benchmarks using both Fortran and C:

435.gromacs: -xCORE-AVX2(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: -xCORE-AVX2 -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-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

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 Wed Jul 29 12:11:10 2015 by SPEC CPU2006 PS/PDF formatter v6932.
Originally published on 28 July 2015.