



# SPEC® CFP2006 Result

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## Hewlett-Packard Company

**SPECfp®2006 = 63.5**

ProLiant DL580 Gen8  
(1.90 GHz, Intel Xeon E7-4809 v2)

**SPECfp\_base2006 = 60.6**

CPU2006 license: 3

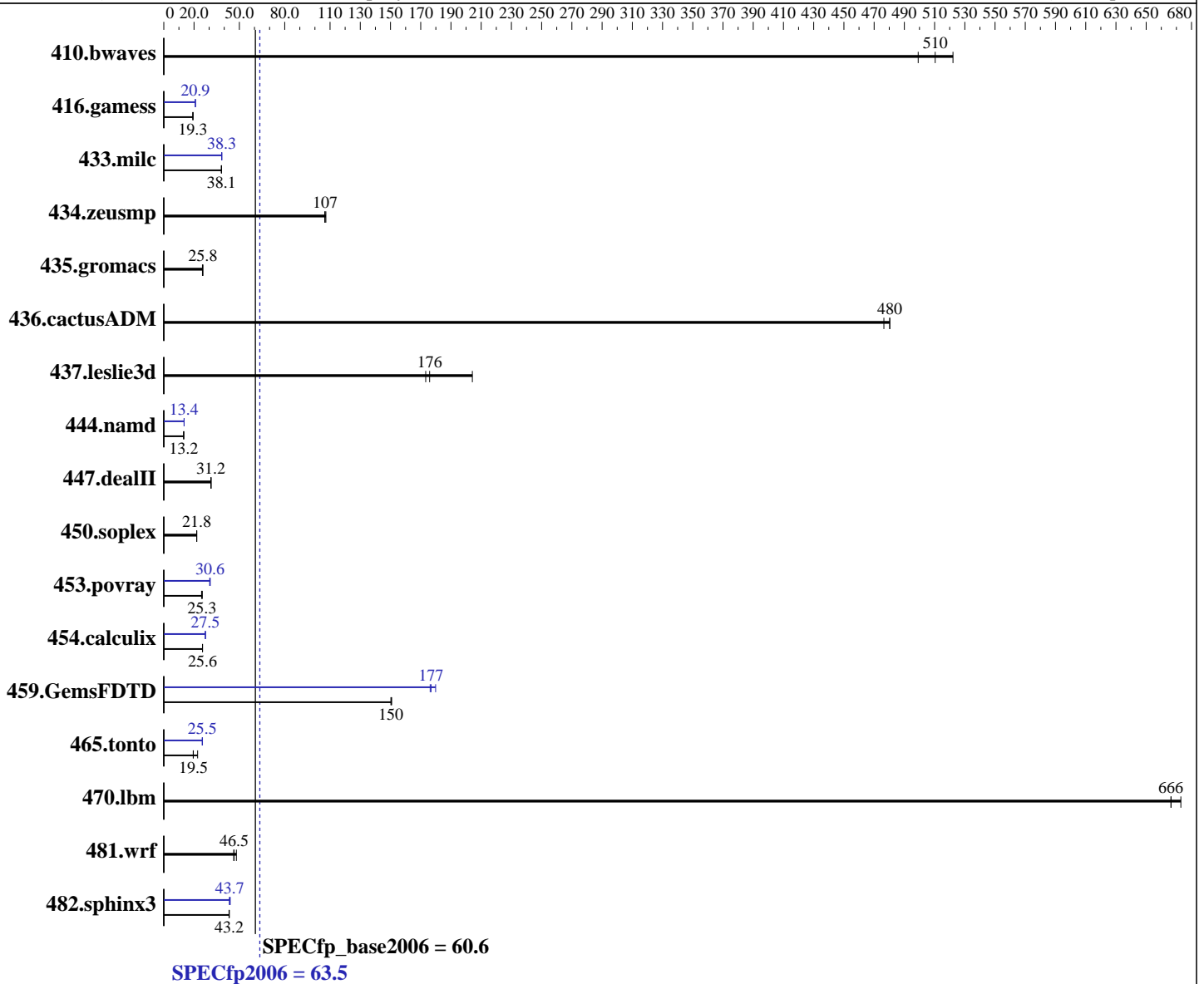
Test date: May-2014

Test sponsor: Hewlett-Packard Company

Hardware Availability: Feb-2014

Tested by: Hewlett-Packard Company

Software Availability: Sep-2013



### Hardware

CPU Name: Intel Xeon E7-4809 v2  
 CPU Characteristics:  
 CPU MHz: 1900  
 FPU: Integrated  
 CPU(s) enabled: 24 cores, 4 chips, 6 cores/chip  
 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: SUSE Linux Enterprise Server 11 (x86\_64) SP3  
 Kernel 3.0.76-0.11-default  
 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: Yes  
 File System: ext3  
 System State: Run level 3 (multi-user)

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L3 Cache: 12 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

Base Pointers: 64-bit  
Peak Pointers: 32/64-bit  
Other Software: None

## Results Table

Benchmark	Base						Peak					
	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	27.2	499	26.0	522	<b>26.6</b>	<b>510</b>	27.2	499	26.0	522	<b>26.6</b>	<b>510</b>
416.gamess	1017	19.3	<b>1016</b>	<b>19.3</b>	1015	19.3	938	20.9	938	20.9	<b>938</b>	<b>20.9</b>
433.milc	<b>241</b>	<b>38.1</b>	241	38.1	240	38.2	239	38.4	<b>240</b>	<b>38.3</b>	240	38.3
434.zeusmp	85.5	106	<b>85.3</b>	<b>107</b>	84.9	107	85.5	106	<b>85.3</b>	<b>107</b>	84.9	107
435.gromacs	279	25.6	276	25.9	<b>277</b>	<b>25.8</b>	279	25.6	276	25.9	<b>277</b>	<b>25.8</b>
436.cactusADM	<b>24.9</b>	<b>480</b>	24.9	480	25.1	476	<b>24.9</b>	<b>480</b>	24.9	480	25.1	476
437.leslie3d	54.2	173	<b>53.4</b>	<b>176</b>	46.0	204	54.2	173	<b>53.4</b>	<b>176</b>	46.0	204
444.namd	<b>609</b>	<b>13.2</b>	609	13.2	609	13.2	596	13.4	597	13.4	<b>597</b>	<b>13.4</b>
447.dealII	<b>366</b>	<b>31.2</b>	366	31.3	367	31.2	<b>366</b>	<b>31.2</b>	366	31.3	367	31.2
450.soplex	<b>383</b>	<b>21.8</b>	383	21.8	382	21.8	<b>383</b>	<b>21.8</b>	383	21.8	382	21.8
453.povray	213	25.0	<b>210</b>	<b>25.3</b>	209	25.4	<b>174</b>	<b>30.6</b>	175	30.3	173	30.7
454.calculix	322	25.6	<b>322</b>	<b>25.6</b>	323	25.6	300	27.5	300	27.5	<b>300</b>	<b>27.5</b>
459.GemsFDTD	70.6	150	<b>70.6</b>	<b>150</b>	70.4	151	<b>60.0</b>	<b>177</b>	60.2	176	59.0	180
465.tonto	<b>503</b>	<b>19.5</b>	506	19.5	440	22.4	<b>386</b>	<b>25.5</b>	387	25.4	384	25.6
470.lbm	<b>20.6</b>	<b>666</b>	20.4	673	20.6	666	<b>20.6</b>	<b>666</b>	20.4	673	20.6	666
481.wrf	241	46.3	<b>240</b>	<b>46.5</b>	233	48.0	241	46.3	<b>240</b>	<b>46.5</b>	233	48.0
482.sphinx3	452	43.1	449	43.4	<b>451</b>	<b>43.2</b>	443	43.9	450	43.3	<b>446</b>	<b>43.7</b>

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
Filesystem page cache cleared with:
  echo 1 > /proc/sys/vm/drop_caches
runspec command invoked through numactl i.e.:
  numactl --interleave=all runspec <etc>
Disabled unused Linux services through "stop_services.sh" before running.
```



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### Platform Notes

#### BIOS Configuration:

Intel Hyperthreading Options set to Disabled  
 HP Power Profile set to Maximum Performance  
 Minimum Processor Idle Power Core State set to C1E State to Enabled  
 Minimum Processor Idle Power Packages State set to Package C6 (non-retention) State  
 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 May 15 10:20:15 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 E7-4809 v2 @ 1.90GHz
 4 "physical id"s (chips)
 24 "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    : 6
  siblings     : 6
  physical 0: cores 0 1 2 3 4 5
  physical 1: cores 0 1 2 3 4 5
  physical 2: cores 0 1 2 3 4 5
  physical 3: cores 0 1 2 3 4 5
cache size     : 12288 KB

```

#### From /proc/meminfo

```

MemTotal:      1058855444 kB
HugePages_Total: 0
Hugepagesize:  2048 kB

```

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

SUSE Linux Enterprise Server 11 (x86\_64)

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

```

SuSE-release:
  SUSE Linux Enterprise Server 11 (x86_64)
  VERSION = 11
  PATCHLEVEL = 3

```

#### uname -a:

Linux DL580-Gen8-sr 3.0.76-0.11-default #1 SMP Fri Jun 14 08:21:43 UTC 2013 (ccab990) x86\_64 x86\_64 x86\_64 GNU/Linux

run-level 3 May 15 10:18 last=S

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## Platform Notes (Continued)

SPEC is set to: /cpu2006

Filesystem	Type	Size	Used	Avail	Use%	Mounted on
/dev/sda3	ext3	365G	13G	334G	4%	/

Additional information from dmidecode:

BIOS HP P79 02/21/2014

Memory:

64x HP 712383-081 16 GB 1333 MHz

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:

KMP\_AFFINITY = "granularity=fine,compact"

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

OMP\_NUM\_THREADS = "24"

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

Assuming that the memory populations rules found in the DL580 Gen8 QuickSpecs are followed, HP supports memory running at 1333 MHz on the E7-4850 v2, E7-4830 v2, E7-4820 v2, or E7-4809 v2 processors with any BIOS prior to the 1.03\_06-27-2014 ROM. Any BIOS that is the 1.03\_06-27-2014 ROM or later, does not support the memory running at 1333 MHz due to a change in the Intel MRC (Memory Reference Code).

## 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



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## 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.deallI: -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 -parallel -opt-prefetch -ansi-alias

C++ benchmarks:  
-xAVX -ipo -O3 -no-prec-div -opt-prefetch -ansi-alias

Fortran benchmarks:  
-xAVX -ipo -O3 -no-prec-div -parallel -opt-prefetch

Benchmarks using both Fortran and C:  
-xAVX -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

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



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## Peak Portability Flags

Same as Base Portability Flags

## 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) -prof-use(pass 2) -auto-ilp32  
-ansi-alias

470.lbm: basepeak = yes

482.sphinx3: -xAVX -ipo -O3 -no-prec-div -unroll2 -ansi-alias  
-parallel

C++ benchmarks:

444.namd: -xAVX(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: -xAVX(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: -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: basepeak = yes

459.GemsFDTD: -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 -opt-prefetch -parallel

465.tonto: -xAVX(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

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## Peak Optimization Flags (Continued)

Benchmarks using both Fortran and C:

435.gromacs: basepeak = yes

436.cactusADM: basepeak = yes

454.calculix: -xAVX -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-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>  
<http://www.spec.org/cpu2006/flags/HP-Platform-Flags-Intel-V1.2-revD.xml>

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