



# SPEC<sup>®</sup> CFP2006 Result

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## Hewlett-Packard Company

SPECfp<sup>®</sup>\_rate2006 = 252

ProLiant DL360e Gen8  
(2.40 GHz, Intel Xeon E5-2470 v2)

SPECfp\_rate\_base2006 = 245

CPU2006 license: 3

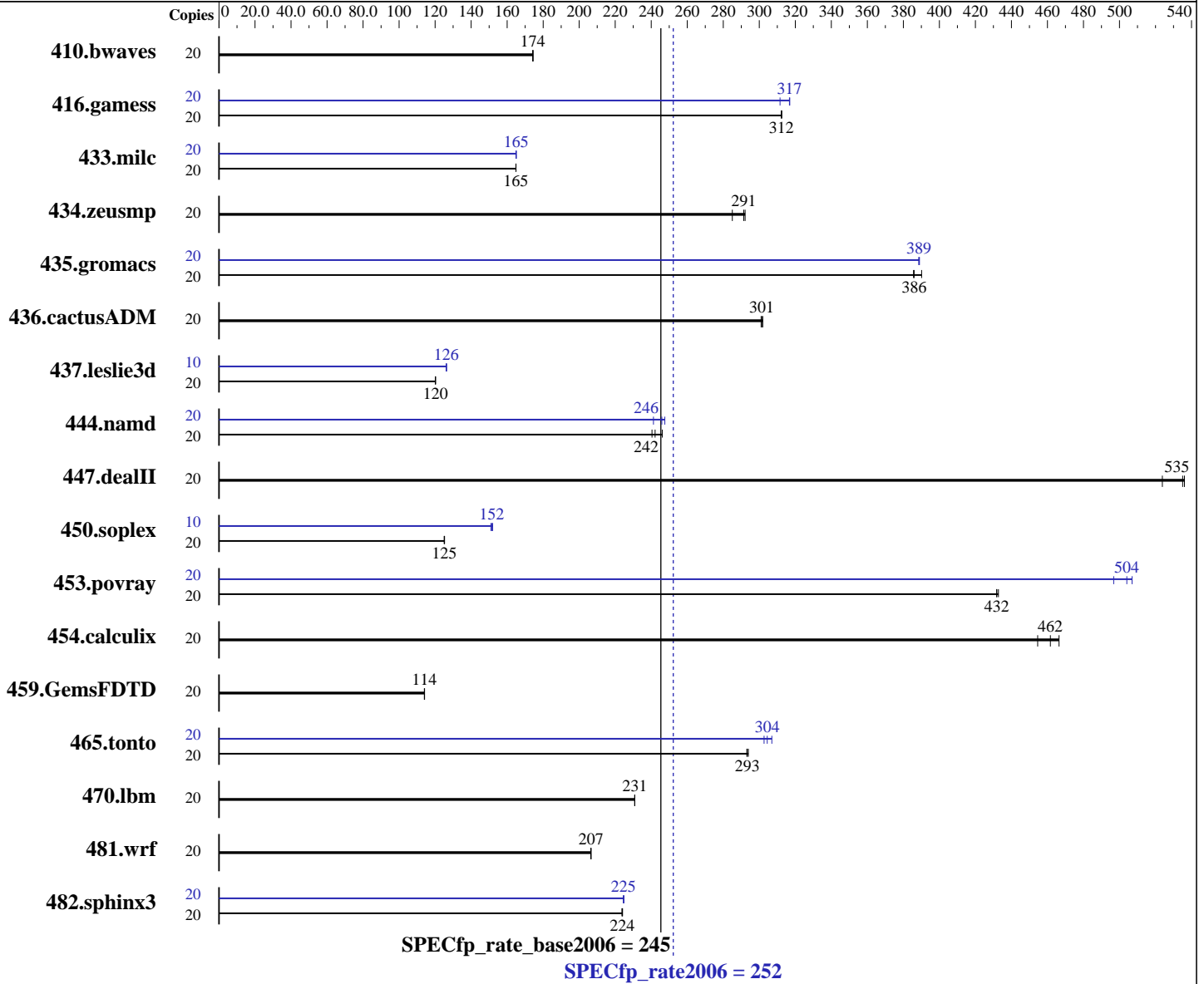
Test sponsor: Hewlett-Packard Company

Tested by: Hewlett-Packard Company

Test date: Jan-2014

Hardware Availability: Jan-2014

Software Availability: Nov-2013



### Hardware

CPU Name: Intel Xeon E5-2470 v2  
 CPU Characteristics: Intel Turbo Boost Technology up to 3.20 GHz  
 CPU MHz: 2400  
 FPU: Integrated  
 CPU(s) enabled: 10 cores, 1 chip, 10 cores/chip, 2 threads/core  
 CPU(s) orderable: 1,2 chips  
 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 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: No  
 File System: ext3  
 System State: Run level 3 (multi-user)

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L3 Cache: 25 MB I+D on chip per chip  
Other Cache: None  
Memory: 48 GB (6 x 8 GB 2Rx4 PC3-12800R-11, ECC)  
Disk Subsystem: 1 x 300 GB 15 K SAS, RAID 1  
Other Hardware: None

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	20	1559	174	1560	174	<u>1559</u>	<u>174</u>	20	1559	174	1560	174	<u>1559</u>	<u>174</u>
416.gamess	20	1253	312	1254	312	<u>1254</u>	<u>312</u>	20	1236	317	<u>1236</u>	<u>317</u>	1257	312
433.milc	20	<u>1113</u>	<u>165</u>	1113	165	1114	165	20	<u>1113</u>	<u>165</u>	1113	165	1113	165
434.zeusmp	20	<u>625</u>	<u>291</u>	639	285	623	292	20	<u>625</u>	<u>291</u>	639	285	623	292
435.gromacs	20	<u>370</u>	<u>386</u>	370	386	366	390	20	<u>367</u>	<u>389</u>	367	389	367	389
436.cactusADM	20	794	301	<u>793</u>	<u>301</u>	792	302	20	794	301	<u>793</u>	<u>301</u>	792	302
437.leslie3d	20	1563	120	<u>1564</u>	<u>120</u>	1565	120	10	<u>745</u>	<u>126</u>	744	126	745	126
444.namd	20	<u>662</u>	<u>242</u>	652	246	667	240	20	648	248	665	241	<u>652</u>	<u>246</u>
447.dealII	20	437	524	427	536	<u>428</u>	<u>535</u>	20	437	524	427	536	<u>428</u>	<u>535</u>
450.soplex	20	<u>1332</u>	<u>125</u>	1334	125	1332	125	10	549	152	552	151	<u>550</u>	<u>152</u>
453.povray	20	<u>246</u>	<u>432</u>	246	433	246	432	20	210	507	214	497	<u>211</u>	<u>504</u>
454.calculix	20	354	466	363	455	<u>357</u>	<u>462</u>	20	354	466	363	455	<u>357</u>	<u>462</u>
459.GemsFDTD	20	1859	114	1861	114	<u>1860</u>	<u>114</u>	20	1859	114	1861	114	<u>1860</u>	<u>114</u>
465.tonto	20	670	294	<u>671</u>	<u>293</u>	671	293	20	<u>647</u>	<u>304</u>	650	303	641	307
470.lbm	20	<u>1190</u>	<u>231</u>	1190	231	1190	231	20	<u>1190</u>	<u>231</u>	1190	231	1190	231
481.wrf	20	<u>1082</u>	<u>207</u>	1081	207	1082	206	20	<u>1082</u>	<u>207</u>	1081	207	1082	206
482.sphinx3	20	<u>1741</u>	<u>224</u>	1742	224	1740	224	20	1736	225	1734	225	<u>1736</u>	<u>225</u>

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>
```



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**CPU2006 license:** 3  
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### Platform Notes

#### BIOS Configuration:

HP Power Regulator was set to HP Static High Performance Mode  
HP Power Profile was set to Maximum Performance  
Memory Refresh Rate was set to 1x Refresh  
Sysinfo program /home/cpu2006/config/sysinfo.rev6874.hp  
\$Rev: 6874 \$ \$Date:: 2013-11-20 #\$ e05b96ddac6c3d74bfe176502a0a2391  
running on dl360egen8rwen Mon Jan 20 10:33:23 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 E5-2470 v2 @ 2.40GHz
 1 "physical id"s (chips)
 20 "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 : 10
  siblings  : 20
 physical 0: cores 0 1 2 3 4 8 9 10 11 12
 cache size : 25600 KB
```

#### From /proc/meminfo

```
MemTotal:      49260212 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 dl360egen8rwen 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 Jan 19 22:08 last=S

#### SPEC is set to: /home/cpu2006

```
Filesystem      Type      Size      Used Avail Use% Mounted on
/dev/sda2        ext3      549G      27G  521G   5% /
```

#### 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

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## Platform Notes (Continued)

hardware, firmware, and the "DMTF SMBIOS" standard.

BIOS HP P73 11/12/2013

Memory:

6x HP 689911-071 8 GB 1600 MHz

6x UNKNOWN NOT AVAILABLE

(End of data from sysinfo program)

Regarding the sysinfo display about the memory installed, the correct amount of memory is 48 GB and the dmidecode description should have one line reading as:

6x HP 689911-071 8 GB 1600 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 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

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

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## Base Portability Flags (Continued)

```

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

```

Benchmarks using both Fortran and C:

```

icc -m64 ifort -m64

```



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Software Availability: Nov-2013

## 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

```

```

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:

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## Peak Optimization Flags (Continued)

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: 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-revB.20131009.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-revB.20131009.xml>

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

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