



# SPEC® CFP2006 Result

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## Hewlett-Packard Company

SPECfp®2006 = **98.5**

ProLiant DL360 Gen9  
(2.40 GHz, Intel Xeon E5-2620 v3)

SPECfp\_base2006 = **94.0**

CPU2006 license: 3

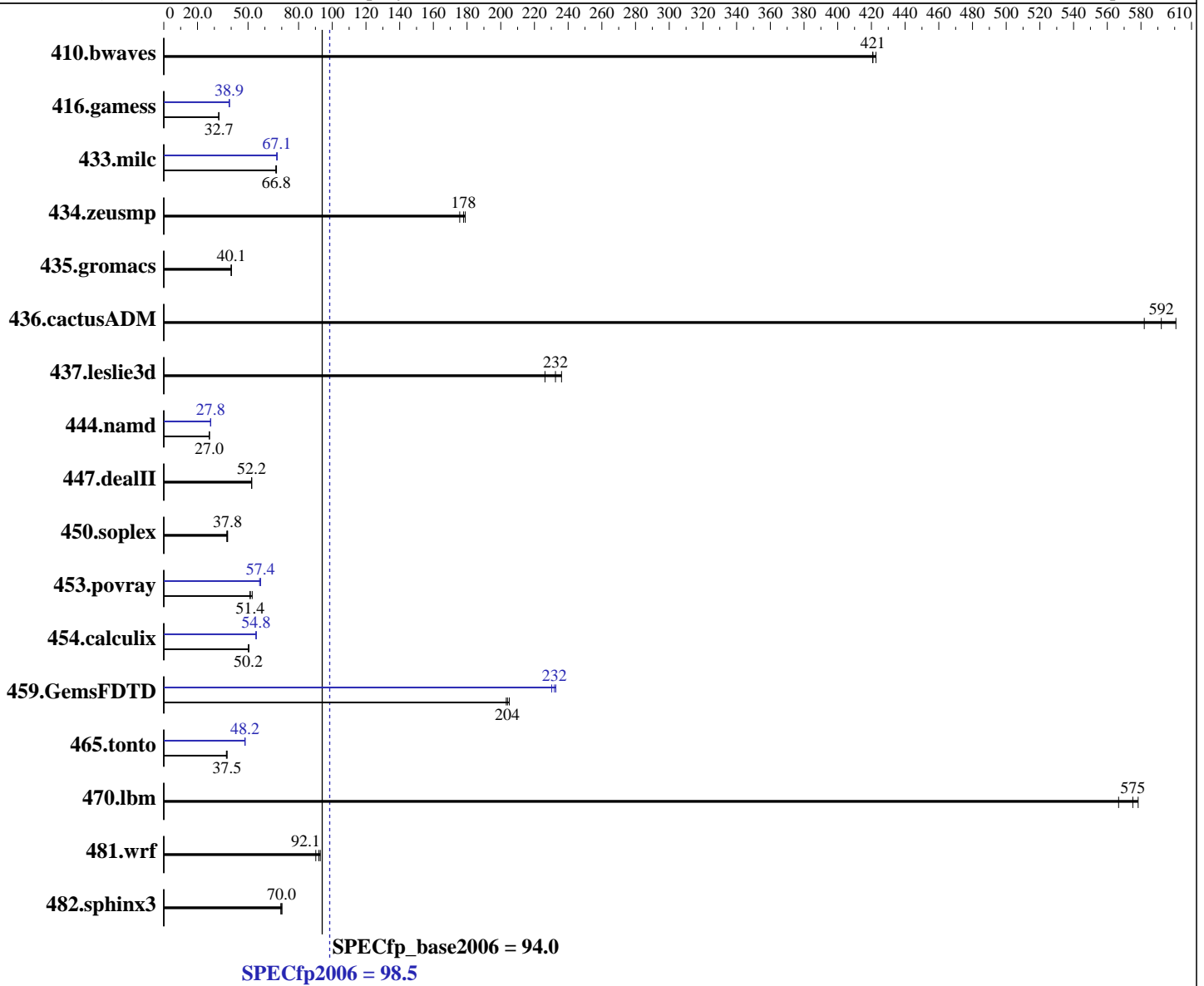
Test date: Nov-2014

Test sponsor: Hewlett-Packard Company

Hardware Availability: Sep-2014

Tested by: Hewlett-Packard Company

Software Availability: Sep-2014



**Hardware**

CPU Name: Intel Xeon E5-2620 v3  
 CPU Characteristics: Intel Turbo Boost Technology up to 3.20 GHz  
 CPU MHz: 2400  
 FPU: Integrated  
 CPU(s) enabled: 12 cores, 2 chips, 6 cores/chip  
 CPU(s) orderable: 1,2 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 7.0 (Maipo)  
 Kernel 3.10.0-123.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



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L3 Cache: 15 MB I+D on chip per chip  
Other Cache: None  
Memory: 256 GB (16 x 16 GB 2Rx4 PC4-2133P-R, running at 1866 MHz)  
Disk Subsystem: 1 x 400 GB SSD SAS, RAID 0  
Other Hardware: None

System State: Run level 3 (multi-user)  
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	32.2	423	32.3	421	<b><u>32.3</u></b>	<b><u>421</u></b>	32.2	423	32.3	421	<b><u>32.3</u></b>	<b><u>421</u></b>
416.gamess	601	32.6	<b><u>599</u></b>	<b><u>32.7</u></b>	598	32.7	502	39.0	<b><u>504</u></b>	<b><u>38.9</u></b>	504	38.8
433.milc	<b><u>138</u></b>	<b><u>66.8</u></b>	137	66.9	138	66.5	<b><u>137</u></b>	<b><u>67.1</u></b>	136	67.3	137	67.1
434.zeusmp	51.8	176	50.9	179	<b><u>51.1</u></b>	<b><u>178</u></b>	51.8	176	50.9	179	<b><u>51.1</u></b>	<b><u>178</u></b>
435.gromacs	179	40.0	178	40.1	<b><u>178</u></b>	<b><u>40.1</u></b>	179	40.0	178	40.1	<b><u>178</u></b>	<b><u>40.1</u></b>
436.cactusADM	19.9	601	20.5	582	<b><u>20.2</u></b>	<b><u>592</u></b>	19.9	601	20.5	582	<b><u>20.2</u></b>	<b><u>592</u></b>
437.leslie3d	<b><u>40.4</u></b>	<b><u>232</u></b>	41.5	226	39.8	236	<b><u>40.4</u></b>	<b><u>232</u></b>	41.5	226	39.8	236
444.namd	297	27.0	296	27.1	<b><u>297</u></b>	<b><u>27.0</u></b>	288	27.8	288	27.8	<b><u>288</u></b>	<b><u>27.8</u></b>
447.dealII	<b><u>219</u></b>	<b><u>52.2</u></b>	220	52.1	219	52.2	<b><u>219</u></b>	<b><u>52.2</u></b>	220	52.1	219	52.2
450.soplex	223	37.4	220	37.9	<b><u>221</u></b>	<b><u>37.8</u></b>	223	37.4	220	37.9	<b><u>221</u></b>	<b><u>37.8</u></b>
453.povray	104	51.2	101	52.5	<b><u>104</u></b>	<b><u>51.4</u></b>	93.6	56.9	<b><u>92.7</u></b>	<b><u>57.4</u></b>	92.6	57.5
454.calculix	163	50.5	<b><u>164</u></b>	<b><u>50.2</u></b>	164	50.2	<b><u>150</u></b>	<b><u>54.8</u></b>	151	54.7	150	54.9
459.GemsFDTD	51.7	205	<b><u>52.0</u></b>	<b><u>204</u></b>	52.2	203	46.1	230	<b><u>45.8</u></b>	<b><u>232</u></b>	45.6	233
465.tonto	<b><u>263</u></b>	<b><u>37.5</u></b>	265	37.2	262	37.5	204	48.2	204	48.2	<b><u>204</u></b>	<b><u>48.2</u></b>
470.lbm	23.8	578	<b><u>23.9</u></b>	<b><u>575</u></b>	24.2	567	23.8	578	<b><u>23.9</u></b>	<b><u>575</u></b>	24.2	567
481.wrf	<b><u>121</u></b>	<b><u>92.1</u></b>	124	90.2	120	92.9	<b><u>121</u></b>	<b><u>92.1</u></b>	124	90.2	120	92.9
482.sphinx3	278	70.1	<b><u>278</u></b>	<b><u>70.0</u></b>	281	69.4	278	70.1	<b><u>278</u></b>	<b><u>70.0</u></b>	281	69.4

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:  
HP Power Profile set to Maximum Performance  
QPI Snoop Configuration set to Home Snoop  
Thermal Configuration set to Maximum Cooling  
Collaborative Power Control set to Disabled  
Processor Power and Utilization Monitoring set to Disabled  
Intel Hyperthreading Technology set to Disabled

Continued on next page



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### Platform Notes (Continued)

Memory Refresh Rate set to 1x Refresh

Sysinfo program /home/cpu2006/config/sysinfo.rev6914  
\$Rev: 6914 \$ \$Date:: 2014-06-25 #\$ e3fbb8667b5a285932ceab81e28219e1  
running on Pilot-DL360-G9 Thu Nov 20 13:43:05 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 E5-2620 v3 @ 2.40GHz
 2 "physical id"s (chips)
 12 "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
cache size      : 15360 KB
```

```
From /proc/meminfo
MemTotal:        263847284 kB
HugePages_Total: 0
Hugepagesize:    2048 kB
```

```
From /etc/*release* /etc/*version*
os-release:
NAME="Red Hat Enterprise Linux Server"
VERSION="7.0 (Maipo)"
ID="rhel"
ID_LIKE="fedora"
VERSION_ID="7.0"
PRETTY_NAME="Red Hat Enterprise Linux Server 7.0 (Maipo)"
ANSI_COLOR="0;31"
CPE_NAME="cpe:/o:redhat:enterprise_linux:7.0:GA:server"
redhat-release: Red Hat Enterprise Linux Server release 7.0 (Maipo)
system-release: Red Hat Enterprise Linux Server release 7.0 (Maipo)
system-release-cpe: cpe:/o:redhat:enterprise_linux:7.0:ga:server
```

```
uname -a:
Linux Pilot-DL360-G9 3.10.0-123.el7.x86_64 #1 SMP Mon May 5 11:16:57 EDT 2014
x86_64 x86_64 x86_64 GNU/Linux
```

run-level 3 Nov 20 13:40

SPEC is set to: /home/cpu2006

```
Filesystem                Type      Size  Used Avail Use% Mounted on
/dev/mapper/rhel_pilot--dl360--g9-home xfs      318G  151G  168G  48% /home
```

Additional information from dmidecode:

Continued on next page



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## Platform Notes (Continued)

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 P89 07/11/2014

Memory:

16x HP NOT AVAILABLE 16 GB 2 rank 2133 MHz, configured at 1866 MHz  
8x UNKNOWN NOT AVAILABLE

(End of data from sysinfo program)

Regarding the sysinfo display about the memory installed, the correct amount of memory is 256 GB and the dmidecode description should have one line reading as:  
16x HP NOT AVAILABLE 16 GB 2 rank 2133 MHz, configured at 1866 MHz

## General Notes

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

KMP\_AFFINITY = "granularity=fine,compact"

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

OMP\_NUM\_THREADS = "12"

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

## Base Portability Flags

410.bwaves: -DSPEC\_CPU\_LP64

416.gamess: -DSPEC\_CPU\_LP64

433.milc: -DSPEC\_CPU\_LP64

434.zeusmp: -DSPEC\_CPU\_LP64

Continued on next page



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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:
-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

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: -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.dealIII: 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

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

Continued on next page



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## Peak Optimization Flags (Continued)

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>

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

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