



# SPEC® CFP2006 Result

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## Hewlett-Packard Company

**SPECfp®2006 = 113**

ProLiant DL380 Gen9  
(2.60 GHz, Intel Xeon E5-2660 v3)

**SPECfp\_base2006 = 108**

CPU2006 license: 3

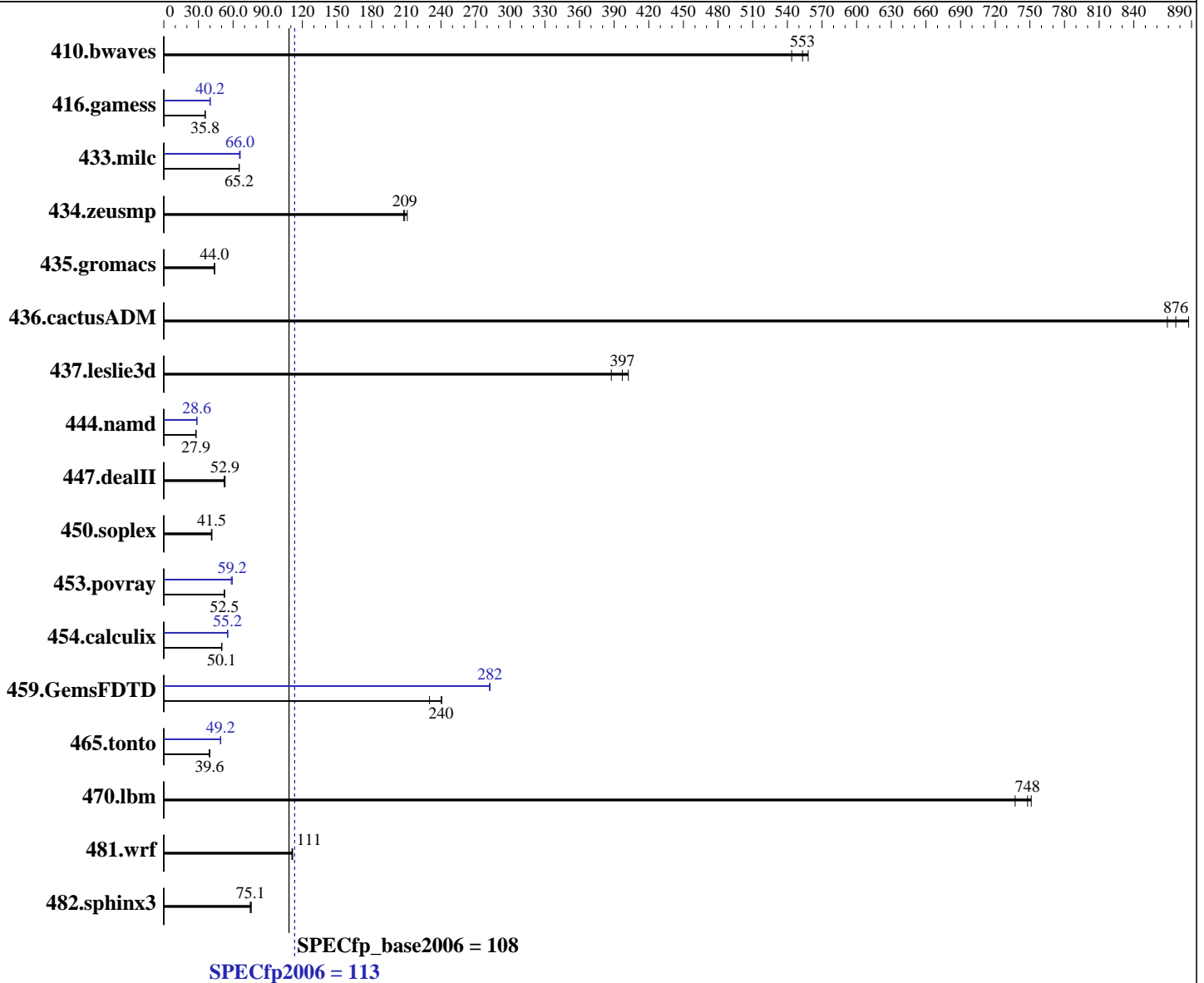
Test date: Oct-2014

Test sponsor: Hewlett-Packard Company

Hardware Availability: Sep-2014

Tested by: Hewlett-Packard Company

Software Availability: Sep-2014



### Hardware

CPU Name: Intel Xeon E5-2660 v3  
 CPU Characteristics: Intel Turbo Boost Technology up to 3.30 GHz  
 CPU MHz: 2600  
 FPU: Integrated  
 CPU(s) enabled: 20 cores, 2 chips, 10 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 3.10.0-121.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: ext4

Continued on next page



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L3 Cache: 25 MB I+D on chip per chip  
 Other Cache: None  
 Memory: 256 GB (16 x 16 GB 2Rx4 PC4-2133P-R)  
 Disk Subsystem: 1 x 400 GB SAS SSD, 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	24.4	558	25.0	544	<b><u>24.6</u></b>	<b><u>553</u></b>	24.4	558	25.0	544	<b><u>24.6</u></b>	<b><u>553</u></b>
416.gamess	545	35.9	<b><u>547</u></b>	<b><u>35.8</u></b>	548	35.7	<b><u>487</u></b>	<b><u>40.2</u></b>	487	40.2	490	40.0
433.milc	<b><u>141</u></b>	<b><u>65.2</u></b>	141	65.1	140	65.4	140	65.5	139	66.1	<b><u>139</u></b>	<b><u>66.0</u></b>
434.zeusmp	43.2	211	43.8	208	<b><u>43.6</u></b>	<b><u>209</u></b>	43.2	211	43.8	208	<b><u>43.6</u></b>	<b><u>209</u></b>
435.gromacs	164	43.6	<b><u>162</u></b>	<b><u>44.0</u></b>	162	44.1	164	43.6	<b><u>162</u></b>	<b><u>44.0</u></b>	162	44.1
436.cactusADM	13.5	888	13.8	869	<b><u>13.6</u></b>	<b><u>876</u></b>	13.5	888	13.8	869	<b><u>13.6</u></b>	<b><u>876</u></b>
437.leslie3d	23.4	402	<b><u>23.7</u></b>	<b><u>397</u></b>	24.3	388	23.4	402	<b><u>23.7</u></b>	<b><u>397</u></b>	24.3	388
444.namd	<b><u>288</u></b>	<b><u>27.9</u></b>	288	27.9	288	27.9	280	28.7	<b><u>280</u></b>	<b><u>28.6</u></b>	280	28.6
447.dealII	219	52.2	215	53.1	<b><u>216</u></b>	<b><u>52.9</u></b>	219	52.2	215	53.1	<b><u>216</u></b>	<b><u>52.9</u></b>
450.soplex	200	41.6	202	41.2	<b><u>201</u></b>	<b><u>41.5</u></b>	200	41.6	202	41.2	<b><u>201</u></b>	<b><u>41.5</u></b>
453.povray	101	52.4	101	52.6	<b><u>101</u></b>	<b><u>52.5</u></b>	91.1	58.4	<b><u>89.9</u></b>	<b><u>59.2</u></b>	89.9	59.2
454.calculix	164	50.3	<b><u>165</u></b>	<b><u>50.1</u></b>	165	50.1	149	55.5	<b><u>149</u></b>	<b><u>55.2</u></b>	150	55.1
459.GemsFDTD	<b><u>44.2</u></b>	<b><u>240</u></b>	44.1	241	46.1	230	<b><u>37.6</u></b>	<b><u>282</u></b>	37.6	282	37.6	282
465.tonto	247	39.8	<b><u>248</u></b>	<b><u>39.6</u></b>	250	39.3	<b><u>200</u></b>	<b><u>49.2</u></b>	200	49.1	200	49.3
470.lbm	<b><u>18.4</u></b>	<b><u>748</u></b>	18.3	751	18.6	737	<b><u>18.4</u></b>	<b><u>748</u></b>	18.3	751	18.6	737
481.wrf	100	112	<b><u>100</u></b>	<b><u>111</u></b>	101	111	100	112	<b><u>100</u></b>	<b><u>111</u></b>	101	111
482.sphinx3	<b><u>259</u></b>	<b><u>75.1</u></b>	260	74.9	257	75.8	<b><u>259</u></b>	<b><u>75.1</u></b>	260	74.9	257	75.8

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/redhat\_transparent\_hugepage/enabled

## Platform Notes

BIOS Configuration:  
 Intel Hyperthreading Options set to Disabled  
 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  
 Minimum Processor Idle Power Package State set to No Package State  
 QPI Snoop Configuration set to Home Snoop  
 Thermal Configuration set to Maximum Cooling

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### Platform Notes (Continued)

Collaborative Power Control set to Disabled  
Processor Power and Utilization Monitoring set to Disabled  
Memory Double Refresh Rate set to 1x Refresh

Sysinfo program /cpu2006/config/sysinfo.rev6914  
\$Rev: 6914 \$ \$Date:: 2014-06-25 # \$ e3fbb8667b5a285932ceab81e28219e1  
running on DL380-Gen9 Fri Oct 10 12:12:40 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 E5-2660 v3 @ 2.60GHz
 2 "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    : 10
  physical 0: cores 0 2 3 4 8 9 10 11 12
  physical 1: cores 0 2 3 4 8 9 10 11 12
cache size     : 25600 KB
```

```
From /proc/meminfo
MemTotal:      263846308 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 DL380-Gen9 3.10.0-121.el7.x86_64 #1 SMP Tue Apr 8 10:48:19 EDT 2014
x86_64 x86_64 x86_64 GNU/Linux
```

run-level 3 Oct 10 12:04

SPEC is set to: /cpu2006  
Filesystem      Type    Size    Used Avail Use% Mounted on  
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## Platform Notes (Continued)

/dev/sda4 ext4 362G 189G 155G 55% /  
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 P89 07/11/2014

Memory:

2x HP 752369-081 16 GB 2 rank 2133 MHz  
14x HP NOT AVAILABLE 16 GB 2 rank 2133 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 two lines reading as:

2x HP 752369-081 16 GB 2133 MHz 2 rank  
14x HP NOT AVAILABLE 16 GB 2133 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 = "20"

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



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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.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
```

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## 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

Continued on next page



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## 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>

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

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