



# SPEC<sup>®</sup> CFP2006 Result

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Hewlett Packard Enterprise

(Test Sponsor: HPE)

ProLiant DL560 Gen10  
(2.10 GHz, Intel Xeon Gold 6130)

SPECfp<sup>®</sup>2006 = **Not Run**

SPECfp\_base2006 = **131**

CPU2006 license: 3

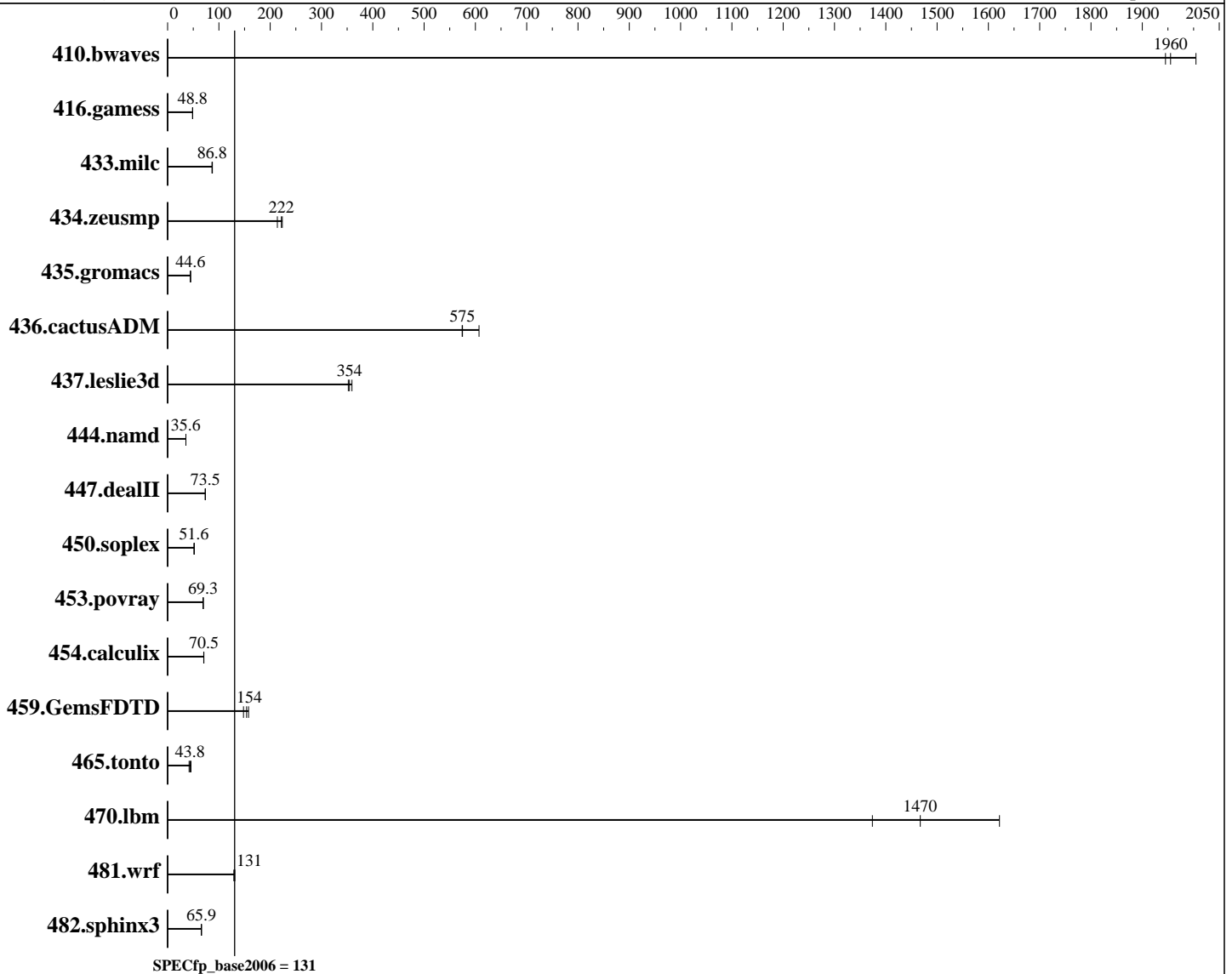
Test sponsor: HPE

Tested by: HPE

Test date: Dec-2017

Hardware Availability: Oct-2017

Software Availability: Apr-2017



### Hardware

CPU Name: Intel Xeon Gold 6130  
 CPU Characteristics: Intel Turbo Boost Technology up to 3.70 GHz  
 CPU MHz: 2100  
 FPU: Integrated  
 CPU(s) enabled: 64 cores, 4 chips, 16 cores/chip  
 CPU(s) orderable: 1, 2, 4 chip(s)  
 Primary Cache: 32 KB I + 32 KB D on chip per core  
 Secondary Cache: 1 MB I+D on chip per core

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### Software

Operating System: Red Hat Enterprise Linux Server release 7.3 (Maipo)  
 Kernel 3.10.0-514.el7.x86\_64  
 Compiler: C/C++: Version 17.0.3.191 of Intel C/C++ Compiler for Linux;  
 Fortran: Version 17.0.3.191 of Intel Fortran Compiler for Linux  
 Auto Parallel: Yes  
 File System: xfs

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L3 Cache: 22 MB I+D on chip per chip  
Other Cache: None  
Memory: 384 GB (48 x 8 GB 2Rx8 PC4-2666V-R)  
Disk Subsystem: 1 x 960 GB SATA SSD, RAID 0  
Other Hardware: None

System State: Run level 3 (multi-user)  
Base Pointers: 64-bit  
Peak Pointers: Not Applicable  
Other Software: None

## Results Table

| Benchmark     | Base              |                    |                    |                    |                    |                    | Peak    |       |         |       |         |       |
|---------------|-------------------|--------------------|--------------------|--------------------|--------------------|--------------------|---------|-------|---------|-------|---------|-------|
|               | Seconds           | Ratio              | Seconds            | Ratio              | Seconds            | Ratio              | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio |
| 410.bwaves    | 6.78              | 2000               | <b><u>6.95</u></b> | <b><u>1960</u></b> | 6.99               | 1950               |         |       |         |       |         |       |
| 416.gamess    | 402               | 48.8               | <b><u>401</u></b>  | <b><u>48.8</u></b> | 401                | 48.8               |         |       |         |       |         |       |
| 433.milc      | 105               | 87.3               | 106                | 86.6               | <b><u>106</u></b>  | <b><u>86.8</u></b> |         |       |         |       |         |       |
| 434.zeusmp    | 42.5              | 214                | <b><u>41.0</u></b> | <b><u>222</u></b>  | 40.7               | 224                |         |       |         |       |         |       |
| 435.gromacs   | 160               | 44.6               | 160                | 44.6               | <b><u>160</u></b>  | <b><u>44.6</u></b> |         |       |         |       |         |       |
| 436.cactusADM | 19.7              | 607                | <b><u>20.8</u></b> | <b><u>575</u></b>  | 20.8               | 574                |         |       |         |       |         |       |
| 437.leslie3d  | 26.2              | 359                | 26.7               | 352                | <b><u>26.5</u></b> | <b><u>354</u></b>  |         |       |         |       |         |       |
| 444.namd      | <b><u>225</u></b> | <b><u>35.6</u></b> | 225                | 35.7               | 225                | 35.6               |         |       |         |       |         |       |
| 447.dealII    | 156               | 73.4               | <b><u>156</u></b>  | <b><u>73.5</u></b> | 155                | 73.6               |         |       |         |       |         |       |
| 450.soplex    | <b><u>162</u></b> | <b><u>51.6</u></b> | 162                | 51.6               | 160                | 52.1               |         |       |         |       |         |       |
| 453.povray    | 76.6              | 69.5               | <b><u>76.8</u></b> | <b><u>69.3</u></b> | 76.8               | 69.3               |         |       |         |       |         |       |
| 454.calculix  | <b><u>117</u></b> | <b><u>70.5</u></b> | 117                | 70.4               | 117                | 70.7               |         |       |         |       |         |       |
| 459.GemsFDTD  | 71.7              | 148                | 67.2               | 158                | <b><u>68.9</u></b> | <b><u>154</u></b>  |         |       |         |       |         |       |
| 465.tonto     | 216               | 45.6               | 235                | 41.9               | <b><u>225</u></b>  | <b><u>43.8</u></b> |         |       |         |       |         |       |
| 470.lbm       | 8.47              | 1620               | 10.0               | 1370               | <b><u>9.36</u></b> | <b><u>1470</u></b> |         |       |         |       |         |       |
| 481.wrf       | 85.4              | 131                | 86.5               | 129                | <b><u>85.5</u></b> | <b><u>131</u></b>  |         |       |         |       |         |       |
| 482.sphinx3   | 295               | 66.0               | 297                | 65.7               | <b><u>296</u></b>  | <b><u>65.9</u></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 by default  
Filesystem page cache cleared with:  
shell invocation of 'sync; echo 3 > /proc/sys/vm/drop\_caches' prior to run  
irqbalance disabled with "systemctl stop irqbalance"  
tuned profile set with "tuned-adm profile throughput-performance"

## Platform Notes

BIOS Configuration:  
Intel Hyper-Threading set to Disabled  
Thermal Configuration set to Maximum Cooling  
LLC Prefetch set to Enabled  
LLC Dead Line Allocation set to Disabled

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## Platform Notes (Continued)

Stale A to S set to Enabled  
 Memory Patrol Scrubbing set to Disabled  
 Workload Profile set to General Peak Frequency Compute  
 Energy/Performance Bias set to Maximum Performance  
 Workload Profile set to Custom  
 NUMA Group Size Optimization set to Flat  
 Sysinfo program /home/cpu2006/config/sysinfo.rev6993  
 Revision 6993 of 2015-11-06 (b5e8d4b4eb51ed28d7f98696cbe290c1)  
 running on DL560G10 Mon Dec 11 11:47:10 2017

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) Gold 6130 CPU @ 2.10GHz
 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      : 16
siblings       : 16
physical 0:    : cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
physical 1:    : cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
physical 2:    : cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
physical 3:    : cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
cache size     : 22528 KB
```

From /proc/meminfo

```
MemTotal:      395925056 kB
HugePages_Total: 0
Hugepagesize:  2048 kB
```

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

```
os-release:
NAME="Red Hat Enterprise Linux Server"
VERSION="7.3 (Maipo)"
ID="rhel"
ID_LIKE="fedora"
VERSION_ID="7.3"
PRETTY_NAME="Red Hat Enterprise Linux Server 7.3 (Maipo)"
ANSI_COLOR="0;31"
CPE_NAME="cpe:/o:redhat:enterprise_linux:7.3:GA:server"
redhat-release: Red Hat Enterprise Linux Server release 7.3 (Maipo)
system-release: Red Hat Enterprise Linux Server release 7.3 (Maipo)
system-release-cpe: cpe:/o:redhat:enterprise_linux:7.3:ga:server
```

uname -a:

```
Linux DL560G10 3.10.0-514.el7.x86_64 #1 SMP Wed Oct 19 11:24:13 EDT 2016
x86_64 x86_64 x86_64 GNU/Linux
```

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## Platform Notes (Continued)

run-level 3 Dec 11 09:29

SPEC is set to: /home/cpu2006

| Filesystem                     | Type | Size | Used | Avail | Use% | Mounted on |
|--------------------------------|------|------|------|-------|------|------------|
| /dev/mapper/rhel_dl560g10-home | xfs  | 839G | 37G  | 803G  | 5%   | /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 HPE U34 09/29/2017

Memory:

48x UNKNOWN NOT AVAILABLE 8 GB 2 rank 2666 MHz

(End of data from sysinfo program)

## General Notes

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

KMP\_AFFINITY = "granularity=core,compact"

LD\_LIBRARY\_PATH = "/home/cpu2006/lib/ia32:/home/cpu2006/lib/intel64:/home/cpu2006/sh10.2"

OMP\_NUM\_THREADS = "64"

Binaries compiled on a system with 1x Intel Core i7-4790 CPU + 32GB RAM memory using Redhat Enterprise Linux 7.2

No: The test sponsor attests, as of date of publication, that CVE-2017-5754 (Meltdown) is mitigated in the system as tested and documented.

No: The test sponsor attests, as of date of publication, that CVE-2017-5753 (Spectre variant 1) is mitigated in the system as tested and documented.

No: The test sponsor attests, as of date of publication, that CVE-2017-5715 (Spectre variant 2) is mitigated in the system as tested and documented.

This benchmark result is intended to provide perspective on past performance using the historical hardware and/or software described on this result page.

The system as described on this result page was formerly generally available. At the time of this publication, it may not be shipping, and/or may not be supported, and/or may fail to meet other tests of General Availability described in the SPEC OSG Policy document, <http://www.spec.org/osg/policy.htm>.

This measured result may not be representative of the result that would be measured were this benchmark run with hardware and software available as of the publication date.



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## 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  
 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 -qopt-prefetch

C++ benchmarks:

-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch

Fortran benchmarks:

-xCORE-AVX2 -ipo -O3 -no-prec-div -parallel -qopt-prefetch

Benchmarks using both Fortran and C:

-xCORE-AVX2 -ipo -O3 -no-prec-div -parallel -qopt-prefetch



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The flags files that were used to format this result can be browsed at

<http://www.spec.org/cpu2006/flags/Intel-ic17.0-official-linux64-revF.html>

<http://www.spec.org/cpu2006/flags/HPE-Platform-Flags-Intel-V1.2-SKX-revH.html>

You can also download the XML flags sources by saving the following links:

<http://www.spec.org/cpu2006/flags/Intel-ic17.0-official-linux64-revF.xml>

<http://www.spec.org/cpu2006/flags/HPE-Platform-Flags-Intel-V1.2-SKX-revH.xml>

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For questions about this result, please contact the tester.  
For other inquiries, please contact [webmaster@spec.org](mailto:webmaster@spec.org).

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