## SPEC® CFP2006 Result

**Hewlett Packard Enterprise**  
(Test Sponsor: HPE)  
ProLiant BL460c Gen10  
(1.80 GHz, Intel Xeon Silver 4108)

| SPECfp®2006 = | Not Run | SPECfp_base2006 = | 101 |

| Test date: | Dec-2017 |
| Hardware Availability: | Nov-2017 |
| Software Availability: | Apr-2017 |

| Software Availability: | Apr-2017 |
| Hardware Availability: | Nov-2017 |
| Test date: | Dec-2017 |
| CPU2006 license: | 3 |
| Test sponsor: | HPE |
| Tested by: | HPE |

### Hardware

<table>
<thead>
<tr>
<th>Program</th>
<th>Time (s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>410.bwaves</td>
<td>36.6</td>
</tr>
<tr>
<td>416.gamess</td>
<td>70.1</td>
</tr>
<tr>
<td>433.milc</td>
<td>201</td>
</tr>
<tr>
<td>434.zeusmp</td>
<td>36.9</td>
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<td>435.gromacs</td>
<td>666</td>
</tr>
<tr>
<td>436.cactusADM</td>
<td>311</td>
</tr>
<tr>
<td>444.namd</td>
<td>28.8</td>
</tr>
<tr>
<td>447.dealII</td>
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<td>481.wrf</td>
<td>89.6</td>
</tr>
<tr>
<td>482.sphinx3</td>
<td>49.1</td>
</tr>
</tbody>
</table>

### Software

| Operating System: | Red Hat Enterprise Linux Server release 7.4 (Maipo) |
| 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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**Spec License:** 3  
**Test Sponsor:** HPE  
**Tested by:** HPE  

**CPU 2006 license:** 3  
**Test date:** Dec-2017  
**Hardware Availability:** Nov-2017  
**Software Availability:** Apr-2017  

<table>
<thead>
<tr>
<th>L3 Cache:</th>
<th>11 MB I+D on chip per chip</th>
<th>System State:</th>
<th>Run level 3 (multi-user)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Other Cache:</td>
<td>None</td>
<td>Base Pointers:</td>
<td>64-bit</td>
</tr>
<tr>
<td>Memory:</td>
<td>192 GB (12 x 16 GB 2Rx8 PC4-2666V-R, running at 2400)</td>
<td>Peak Pointers:</td>
<td>Not Applicable</td>
</tr>
<tr>
<td>Disk Subsystem:</td>
<td>1 x 480 GB SATA SSD, RAID 0</td>
<td>Other Software:</td>
<td>None</td>
</tr>
<tr>
<td>Other Hardware:</td>
<td>None</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Operating System Notes**  
Stack size set to unlimited using "ulimit -s unlimited"  
Transparent Huge Pages enabled by default  
Files system 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  

Continued on next page

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### Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Seconds</th>
<th>Ratio</th>
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</table>

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.
**SPEC CFP2006 Result**

**Hewlett Packard Enterprise**
(Test Sponsor: HPE)

**ProLiant BL460c Gen10**
(1.80 GHz, Intel Xeon Silver 4108)

<table>
<thead>
<tr>
<th>SPECfp2006 =</th>
<th>Not Run</th>
</tr>
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<tr>
<td>SPECfp_base2006 =</td>
<td>101</td>
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**CPU2006 license:** 3  
**Test date:** Dec-2017  
**Test sponsor:** HPE  
**Hardware Availability:** Nov-2017  
**Tested by:** HPE  
**Software Availability:** Apr-2017

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**Platform Notes (Continued)**

- LLC Dead Line Allocation set to Disabled
- 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
- Uncore Frequency Scaling set to Auto

Sysinfo program /home/cpu2006/config/sysinfo.rev6993  
Revision 6993 of 2015-11-06 (b5e8d4b4eb51ed28d7f98696cbe290c1)  
runtime on bl460c16 Fri Dec 15 17:14:13 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) Silver 4108 CPU @ 1.80GHz  
- 2 "physical id"s (chips)  
- 16 "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: 8  
  - siblings: 8  
  - physical 0: cores 0 1 2 3 4 5 6 7  
  - physical 1: cores 0 1 2 3 4 5 6 7  
- cache size: 11264 KB

From /proc/meminfo

- MemTotal: 197752440 kB  
- HugePages_Total: 0  
- Hugepagesize: 2048 kB

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

- os-release:
  - NAME="Red Hat Enterprise Linux Server"  
  - VERSION="7.4 (Maipo)"  
  - ID="rhel"  
  - ID_LIKE="fedora"  
  - VARIANT="Server"  
  - VARIANT_ID="server"  
  - VERSION_ID="7.4"  
  - PRETTY_NAME="Red Hat Enterprise Linux Server 7.4 (Maipo)"

- redhat-release: Red Hat Enterprise Linux Server release 7.4 (Maipo)  
- system-release: Red Hat Enterprise Linux Server release 7.4 (Maipo)  

uname -a:

```
Linux bl460c16 3.10.0-693.el7.x86_64 #1 SMP Thu Jul 6 19:56:57 EDT 2017  
x86_64 x86_64 x86_64 GNU/Linux
```

run-level 3 Dec 15 14:24

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SPECfp2006 = Not Run
SPECfp_base2006 = 101

CPU2006 license: 3
Test sponsor: HPE
Tested by: HPE

Platform Notes (Continued)

SPEC is set to: /home/cpu2006
Filesystem Type Size Used Avail Use% Mounted on
/dev/mapper/rhel-home xfs 839G 38G 802G 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 I41 11/14/2017
Memory:
  4x UNKNOWN NOT AVAILABLE
  12x UNKNOWN NOT AVAILABLE 16 GB 2 rank 2666 MHz, configured at 2400 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 = "16"

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

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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SPEC CFP2006 Result

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CPU2006 license: 3
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Test date: Dec-2017
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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 -03 -no-prec-div -parallel -qopt-prefetch

C++ benchmarks:
-xCORE-AVX2 -ipo -03 -no-prec-div -qopt-prefetch

Fortran benchmarks:
-xCORE-AVX2 -ipo -03 -no-prec-div -parallel -qopt-prefetch

Benchmarks using both Fortran and C:
-xCORE-AVX2 -ipo -03 -no-prec-div -parallel -qopt-prefetch
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SPECfp_base2006 = 101

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.

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