Hewlett Packard Enterprise
(Test Sponsor: HPE)
ProLiant DL560 Gen10
(3.20 GHz, Intel Xeon Gold 6134)

HW2006 license: 3
Test sponsor: HPE
Tested by: HPE

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

<table>
<thead>
<tr>
<th>SPECfp®_rate2006 = Not Run</th>
<th>SPECfp_rate_base2006 = 1910</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Hardware</th>
<th>Software</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU Name:</td>
<td>Operating System: SUSE Linux Enterprise Server 12 (x86_64) SP2</td>
</tr>
<tr>
<td>CPU Characteristics:</td>
<td>Kernel 4.4.21-69-default</td>
</tr>
<tr>
<td>CPU MHz:</td>
<td>Compiler: C/C++: Version 17.0.3.191 of Intel C/C++</td>
</tr>
<tr>
<td>FPU:</td>
<td>Compiler for Linux;</td>
</tr>
<tr>
<td>CPU(s) enabled:</td>
<td>Fortran: Version 17.0.3.191 of Intel Fortran</td>
</tr>
<tr>
<td>CPU(s) orderable:</td>
<td>Compiler for Linux</td>
</tr>
<tr>
<td>Primary Cache:</td>
<td>Auto Parallel: No</td>
</tr>
<tr>
<td>Secondary Cache:</td>
<td>File System: xfs</td>
</tr>
<tr>
<td></td>
<td>System State: Run level 3 (multi-user)</td>
</tr>
</tbody>
</table>

**SPECfp®_rate2006 = Not Run**

<table>
<thead>
<tr>
<th>SPECfp_rate_base2006 = 1910</th>
</tr>
</thead>
</table>

**Test date:** Dec-2017  
**Hardware Availability:** Oct-2017  
**Software Availability:** Sep-2017
Hewlett Packard Enterprise
(Test Sponsor: HPE)
ProLiant DL560 Gen10
(3.20 GHz, Intel Xeon Gold 6134)

SPEC CFP2006 Result

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

L3 Cache: 24.75 MB I+D on chip per chip
Other Cache: None
Memory: 768 GB (48 x 16 GB 2Rx8 PC4-2666V-R)
Disk Subsystem: 1 x 800 GB SATA SSD, RAID 0
Other Hardware: None

Base Pointers: 32/64-bit
Peak Pointers: Not Applicable
Other Software: None

Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Copies</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>410.bwaves</td>
<td>64</td>
<td>429</td>
<td>2030</td>
<td>429</td>
<td>2030</td>
<td>429</td>
<td>2030</td>
</tr>
<tr>
<td>416.gamess</td>
<td>64</td>
<td>732</td>
<td>1710</td>
<td>726</td>
<td>1730</td>
<td>732</td>
<td>1710</td>
</tr>
<tr>
<td>433.milc</td>
<td>64</td>
<td>287</td>
<td>2040</td>
<td>287</td>
<td>2050</td>
<td>287</td>
<td>2050</td>
</tr>
<tr>
<td>434.zeusmp</td>
<td>64</td>
<td>258</td>
<td>2260</td>
<td>258</td>
<td>2250</td>
<td>258</td>
<td>2250</td>
</tr>
<tr>
<td>435.gromacs</td>
<td>64</td>
<td>216</td>
<td>2120</td>
<td>217</td>
<td>2110</td>
<td>216</td>
<td>2120</td>
</tr>
<tr>
<td>436.cactusADM</td>
<td>64</td>
<td>314</td>
<td>2430</td>
<td>315</td>
<td>2430</td>
<td>314</td>
<td>2430</td>
</tr>
<tr>
<td>437.leslie3d</td>
<td>64</td>
<td>489</td>
<td>1230</td>
<td>489</td>
<td>1230</td>
<td>486</td>
<td>1240</td>
</tr>
<tr>
<td>444.namd</td>
<td>64</td>
<td>366</td>
<td>1400</td>
<td>368</td>
<td>1390</td>
<td>370</td>
<td>1390</td>
</tr>
<tr>
<td>447.dealII</td>
<td>64</td>
<td>265</td>
<td>2760</td>
<td>266</td>
<td>2760</td>
<td>264</td>
<td>2780</td>
</tr>
<tr>
<td>450.soplex</td>
<td>64</td>
<td>418</td>
<td>1280</td>
<td>418</td>
<td>1280</td>
<td>419</td>
<td>1270</td>
</tr>
<tr>
<td>453.povray</td>
<td>64</td>
<td>143</td>
<td>2380</td>
<td>143</td>
<td>2390</td>
<td>142</td>
<td>2390</td>
</tr>
<tr>
<td>454.calculix</td>
<td>64</td>
<td>200</td>
<td>2640</td>
<td>201</td>
<td>2620</td>
<td>201</td>
<td>2630</td>
</tr>
<tr>
<td>459.GemsFDTD</td>
<td>64</td>
<td>626</td>
<td>1080</td>
<td>626</td>
<td>1090</td>
<td>627</td>
<td>1080</td>
</tr>
<tr>
<td>465.tonto</td>
<td>64</td>
<td>323</td>
<td>1950</td>
<td>321</td>
<td>1960</td>
<td>323</td>
<td>1950</td>
</tr>
<tr>
<td>470.lbm</td>
<td>64</td>
<td>417</td>
<td>2110</td>
<td>417</td>
<td>2110</td>
<td>418</td>
<td>2110</td>
</tr>
<tr>
<td>481.wrf</td>
<td>64</td>
<td>292</td>
<td>2450</td>
<td>292</td>
<td>2450</td>
<td>291</td>
<td>2450</td>
</tr>
<tr>
<td>482.sphinx3</td>
<td>64</td>
<td>724</td>
<td>1720</td>
<td>722</td>
<td>1730</td>
<td>728</td>
<td>1710</td>
</tr>
</tbody>
</table>

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 by default
Filesystem page cache cleared with:
  shell invocation of 'sync; echo 3 > /proc/sys/vm/drop_caches' prior to run
runspec command invoked through numactl i.e.:
  numactl --interleave=all runspec <etc>
irqbalance disabled with "systemctl stop irqbalance"
tuned profile set with "tuned-adm profile throughput-performance"
Continued on next page
Hewlett Packard Enterprise
(Test Sponsor: HPE)
ProLiant DL560 Gen10
(3.20 GHz, Intel Xeon Gold 6134)

SPEC CFP2006 Result

SPECfp_rate2006 = Not Run
SPECfp_rate_base2006 = 1910

CPU2006 license: 3
Test sponsor: HPE
Tested by: HPE
Test date: Dec-2017
Hardware Availability: Oct-2017
Software Availability: Sep-2017

Operating System Notes (Continued)
VM Dirty ratio was set to 40 using "echo 40 > /proc/sys/vm/dirty_ratio"
Numa balancing was disabled using "echo 0 > /proc/sys/kernel/numa_balancing"

Platform Notes

BIOS Configuration:
Thermal Configuration set to Maximum Cooling
Memory Patrol Scrubbing set to Disabled
LLC Prefetch set to Enabled
LLC Dead Line Allocation set to Disabled
Workload Profile set to General Throughput Compute
Minimum Processor Idle Power Core C-State set to C1E State
Sysinfo program /home/cpu2006/config/sysinfo.rev6993
Revision 6993 of 2015-11-06 (b5e9d4b4eb51ed28d7f98696cbe290c1)
running on linux-kkkg Wed Dec 13 14:39:38 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 6134 CPU @ 3.20GHz
  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 : 8
siblings : 16
physical 0: cores 0 4 5 16 17 20 21
physical 1: cores 0 4 5 16 19 20 22
physical 2: cores 0 4 5 16 19 20 22
physical 3: cores 1 3 4 6 7 18 20 22
cache size : 25344 KB

From /proc/meminfo
MemTotal:       792283560 kB
HugePages_Total:       0
Hugepagesize:       2048 kB

/usr/bin/lsb_release -d
SUSE Linux Enterprise Server 12 SP2

From /etc/*release* /etc/*version*
SuSE-release:
SUSE Linux Enterprise Server 12 (x86_64)
VERSION = 12
PATCHLEVEL = 2
# This file is deprecated and will be removed in a future service pack or release.
# Please check /etc/os-release for details about this release.
Continued on next page
Hewlett Packard Enterprise
(Test Sponsor: HPE)
ProLiant DL560 Gen10
(3.20 GHz, Intel Xeon Gold 6134)

SPEC fp_rate2006 = Not Run
SPEC fp_rate_base2006 = 1910

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

Platform Notes (Continued)

os-release:
  NAME="SLES"
  VERSION="12-SP2"
  VERSION_ID="12.2"
  PRETTY_NAME="SUSE Linux Enterprise Server 12 SP2"
  ID="sles"
  ANSI_COLOR="0;32"
  CPE_NAME="cpe:/o:suse:sles:12:sp2"

uname -a:
    (9464f67) x86_64 x86_64 x86_64 GNU/Linux
run-level 3 Dec 12 17:23
SPEC is set to: /home/cpu2006

fsck -Y /dev/sda4

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 16 GB 2 rank 2666 MHz

General Notes

Environment variables set by runspec before the start of the run:
LD_LIBRARY_PATH = "/home/cpu2006/lib/ia32:/home/cpu2006/lib/intel64:/home/cpu2006/sh10.2"

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.
Hewlett Packard Enterprise
(Test Sponsor: HPE)
ProLiant DL560 Gen10
(3.20 GHz, Intel Xeon Gold 6134)

SPECFp_rate2006 = Not Run
SPECFp_rate_base2006 = 1910

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

General Notes (Continued)

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.

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 -nofor_main
444.namd: -DSPEC_CPU_LP64
447.dealII: -DSPEC_CPU_LP64 -nofor_main
450.soplex: -DSPEC_CPU_LP64
453.povray: -DSPEC_CPU_LP64
454.calculix: -DSPEC_CPU_LP64 -nofor_main
459.GemsFDTD: -DSPEC_CPU_LP64 -nofor_main
465.tonto: -DSPEC_CPU_LP64 -nofor_main
470.lbm: -DSPEC_CPU_LP64 -nofor_main
481.wrf: -DSPEC_CPU_LP64 -DSPEC_CPU_CASE_FLAG -DSPEC_CPU_LINUX
482.sphinx3: -DSPEC_CPU_LP64
SPEC CFP2006 Result

Hewlett Packard Enterprise
(Test Sponsor: HPE)
ProLiant DL560 Gen10
(3.20 GHz, Intel Xeon Gold 6134)

SPECfp_rate2006 = Not Run
SPECfp_rate_base2006 = 1910

CPU2006 license: 3
Test date: Dec-2017
Test sponsor: HPE
Hardware Availability: Oct-2017
Tested by: HPE
Software Availability: Sep-2017

Base Optimization Flags

C benchmarks:
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -auto-p32
-qopt-mem-layout-trans=3

C++ benchmarks:
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -auto-p32
-qopt-mem-layout-trans=3

Fortran benchmarks:
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch

Benchmarks using both Fortran and C:
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -auto-p32
-qopt-mem-layout-trans=3

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

SPEC and SPECfp are registered trademarks of the Standard Performance Evaluation Corporation. All other brand and product names appearing in this result are trademarks or registered trademarks of their respective holders.

For questions about this result, please contact the tester.
For other inquiries, please contact webmaster@spec.org.

Tested with SPEC CPU2006 v1.2.
Originally published on 13 June 2018.