### SPEC® CFP2006 Result

**Hewlett Packard Enterprise**  
(Test Sponsor: HPE)  
ProLiant DL560 Gen10  
(2.20 GHz, Intel Xeon Gold 5120)

<table>
<thead>
<tr>
<th>SPECfp_rate2006</th>
<th>Not Run</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECfp_rate_base2006</td>
<td>2120</td>
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</table>

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

<table>
<thead>
<tr>
<th>SPECfp_rate_base2006</th>
<th>2120</th>
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<tbody>
<tr>
<td>Copies</td>
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<tr>
<td>CPU Name:</td>
<td>Intel Xeon Gold 5120</td>
</tr>
<tr>
<td>CPU Characteristics:</td>
<td>Intel Turbo Boost Technology up to 3.20 GHz</td>
</tr>
<tr>
<td>CPU MHz:</td>
<td>2200</td>
</tr>
<tr>
<td>CPU(s) enabled:</td>
<td>56 cores, 4 chips, 14 cores/chip, 2 threads/core</td>
</tr>
<tr>
<td>CPU(s) orderable:</td>
<td>1, 2, 4 chip(s)</td>
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<tr>
<td>Primary Cache:</td>
<td>32 KB I + 32 KB D on chip per core</td>
</tr>
<tr>
<td>Secondary Cache:</td>
<td>1 MB I+D on chip per core</td>
</tr>
<tr>
<td>Operating System:</td>
<td>SUSE Linux Enterprise Server 12 (x86_64) SP2</td>
</tr>
<tr>
<td>Compiler:</td>
<td>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</td>
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<tr>
<td>Auto Parallel:</td>
<td>No</td>
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<tr>
<td>File System:</td>
<td>xfs</td>
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<tr>
<td>System State:</td>
<td>Run level 3 (multi-user)</td>
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**Tests Run**

<table>
<thead>
<tr>
<th>Test</th>
<th>Copies</th>
<th>Results</th>
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<tbody>
<tr>
<td>410.bwaves</td>
<td>112</td>
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<tr>
<td>416.gamess</td>
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<td>433.milc</td>
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<td>434.zeusmp</td>
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<td>459.GemsFDTD</td>
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<td>465.tonto</td>
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<tr>
<td>482.sphinx3</td>
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</table>

**Notes**

- **CPU Name:** Intel Xeon Gold 5120  
- **CPU Characteristics:** Intel Turbo Boost Technology up to 3.20 GHz  
- **CPU MHz:** 2200  
- **CPU(s) enabled:** 56 cores, 4 chips, 14 cores/chip, 2 threads/core  
- **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  
- **Operating System:** SUSE Linux Enterprise Server 12 (x86_64) SP2  
- **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:** No  
- **File System:** xfs  
- **System State:** Run level 3 (multi-user)
SPEC CFP2006 Result

Hewlett Packard Enterprise
(Test Sponsor: HPE)
ProLiant DL560 Gen10
(2.20 GHz, Intel Xeon Gold 5120)

SPECfp_rate2006 = Not Run
SPECfp_rate_base2006 = 2120

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

Test date: Dec-2017
Hardware Availability: Oct-2017
Software Availability: Apr-2017

L3 Cache: 19.25 MB I+D on chip per chip
Other Cache: None
Memory: 384 GB (48 x 8 GB 2Rx8 PC4-2666V-R, running at 2400)
Disk Subsystem: 1 x 960 GB SATA SSD, RAID 0
Other Hardware: None
Base Pointers: 32/64-bit
Peak Pointers: Not Applicable
Other Software: None

Results Table

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

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"
Continued on next page
Operating System Notes (Continued)

tuned profile set with "tuned-adm profile throughput-performance"
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 (b5e8d4db4eb51ed28d7f98696cbe290c1)
running on linux-y57o Thu Dec 14 21:25:21 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 5120 CPU @ 2.20GHz
  4 "physical id"s (chips)
  112 "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 : 14
siblings : 28
physical 0: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14
physical 1: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14
physical 2: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14
physical 3: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14
cache size : 19712 KB

From /proc/meminfo
MemTotal:       395917084 kB
HugePages_Total:       0
Hugepagesize:       2048 kB

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.
os-release:
  NAME="SLES"
Hewlett Packard Enterprise  
(Test Sponsor: HPE)  
ProLiant DL560 Gen10  
(2.20 GHz, Intel Xeon Gold 5120)  

SPEC CFP2006 Result  
HPE  

SPECfp_rate2006 = Not Run  
SPECfp_rate_base2006 = 2120  

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

Test date: Dec-2017  
Hardware Availability: Oct-2017  
Software Availability: Apr-2017  

Platform Notes (Continued)  

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:  
Linux linux-y57o 4.4.21-68-default #1 SMP Tue Oct 18 18:19:37 UTC 2016  
(63cf368) x86_64 x86_64 x86_64 GNU/Linux  
run-level 3 Dec 14 15:55  

SPEC is set to: /home/cpu2006  
Filesyst: Type Size Used Avail Use% Mounted on  
/dev/sdc4 xfs 852G 109G 743G 13% /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 HP U34 09/29/2017  
Memory:  
48x UNKNOWN NOT AVAILABLE 8 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:  
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.  

The system as described on this result page was formerly  
generally available. At the time of this publication, it may  
Continued on next page
SPEC CFP2006 Result

Hewlett Packard Enterprise
(Test Sponsor: HPE)
ProLiant DL560 Gen10
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**SPECFp_rate2006 = Not Run**
**SPECFp_rate_base2006 = 2120**

- **CPU2006 license:** 3
- **Test sponsor:** HPE
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- **Test date:** Dec-2017
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**General Notes (Continued)**

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](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`
- `444.namd: -DSPEC_CPU_LP64 -nofor_main`
- `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`
SPEC CFP2006 Result

Hewlett Packard Enterprise
(Test Sponsor: HPE)
ProLiant DL560 Gen10
(2.20 GHz, Intel Xeon Gold 5120)

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SPECfp_rate2006 = Not Run
SPECfp_rate_base2006 = 2120

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

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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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