### SPEC® CFP2006 Result

Hewlett Packard Enterprise  
(Test Sponsor: HPE)  
ProLiant DL380 Gen10  
(1.70 GHz, Intel Xeon Bronze 3104)

<table>
<thead>
<tr>
<th>SPECfp®2006</th>
<th>69.8</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECfp_base2006</td>
<td>68.6</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Software Availability</th>
<th>Oct-2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test date</td>
<td>Nov-2017</td>
</tr>
<tr>
<td>Hardware Availability</td>
<td>Sep-2017</td>
</tr>
</tbody>
</table>

#### Hardware

- **CPU Name:** Intel Xeon Bronze 3104  
- **CPU Characteristics:**
  - **CPU MHz:** 1700  
  - **FPU:** Integrated  
  - **CPU(s) enabled:** 12 cores, 2 chips, 6 cores/chip  
  - **CPU(s) orderable:** 1, 2 chip(s)  
- **Primary Cache:** 32 KB L1 + 32 KB D on chip per core  
- **Secondary Cache:** 1 MB I+D on chip per core

#### Software

- **Operating System:** SUSE Linux Enterprise Server 12 (x86_64) SP3  
  Kernel 4.4.73-5-default
- **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
- **System State:** Run level 3 (multi-user)

Continued on next page
Hewlett Packard Enterprise
(Test Sponsor: HPE)
ProLiant DL380 Gen10
(1.70 GHz, Intel Xeon Bronze 3104)

SPEC CFP2006 Result

SPECfp2006 = 69.8
SPECfp_base2006 = 68.6

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

L3 Cache: 8.25 MB I+D on chip per chip
Other Cache: None
Memory: 192 GB (24 x 8 GB 2Rx8 PC4-2666V-R, running at 2133)
Disk Subsystem: 1 x 960 GB SATA SSD, RAID 0
Other Hardware: None

Base Pointers: 64-bit
Peak Pointers: 32/64-bit
Other Software: None

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
IRQ balance service was stop using "service irqbalance stop"
Tuned-adm profile was set to Throughtput-Performance

Platform Notes
BIOS Configuration:
Thermal Configuration set to Maximum Cooling
LLC Prefetch set to Enabled
LLC Dead Line Allocation set to Disabled

Results Table

<table>
<thead>
<tr>
<th>Benchmark</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>33.3</td>
<td>408</td>
<td>32.5</td>
<td>418</td>
<td>32.9</td>
<td>414</td>
</tr>
<tr>
<td>416.gamess</td>
<td>896</td>
<td>21.9</td>
<td>895</td>
<td>21.9</td>
<td>896</td>
<td>21.9</td>
</tr>
<tr>
<td>433.milc</td>
<td>171</td>
<td>53.6</td>
<td>174</td>
<td>52.7</td>
<td>172</td>
<td>53.5</td>
</tr>
<tr>
<td>434.zeusmp</td>
<td>58.2</td>
<td>156</td>
<td>58.1</td>
<td>157</td>
<td>58.2</td>
<td>156</td>
</tr>
<tr>
<td>435.gromacs</td>
<td>251</td>
<td>28.5</td>
<td>251</td>
<td>28.5</td>
<td>251</td>
<td>28.5</td>
</tr>
<tr>
<td>436.cactusADM</td>
<td>25.7</td>
<td>464</td>
<td>25.6</td>
<td>467</td>
<td>25.7</td>
<td>465</td>
</tr>
<tr>
<td>437.leslie3d</td>
<td>49.3</td>
<td>191</td>
<td>49.2</td>
<td>191</td>
<td>49.3</td>
<td>191</td>
</tr>
<tr>
<td>444.namd</td>
<td>490</td>
<td>16.4</td>
<td>489</td>
<td>16.4</td>
<td>490</td>
<td>16.4</td>
</tr>
<tr>
<td>447.dealII</td>
<td>325</td>
<td>35.2</td>
<td>325</td>
<td>35.2</td>
<td>324</td>
<td>35.3</td>
</tr>
<tr>
<td>450.soplex</td>
<td>304</td>
<td>27.4</td>
<td>306</td>
<td>27.2</td>
<td>302</td>
<td>27.6</td>
</tr>
<tr>
<td>453.povray</td>
<td>167</td>
<td>31.8</td>
<td>163</td>
<td>32.7</td>
<td>166</td>
<td>32.0</td>
</tr>
<tr>
<td>454.calculix</td>
<td>261</td>
<td>31.7</td>
<td>261</td>
<td>31.7</td>
<td>261</td>
<td>31.6</td>
</tr>
<tr>
<td>459.GemsFDTD</td>
<td>60.5</td>
<td>175</td>
<td>61.3</td>
<td>173</td>
<td>60.3</td>
<td>176</td>
</tr>
<tr>
<td>465.tonto</td>
<td>374</td>
<td>26.3</td>
<td>375</td>
<td>26.2</td>
<td>374</td>
<td>26.3</td>
</tr>
<tr>
<td>470.libm</td>
<td>25.1</td>
<td>547</td>
<td>24.4</td>
<td>563</td>
<td>24.7</td>
<td>556</td>
</tr>
<tr>
<td>481.wrf</td>
<td>189</td>
<td>59.1</td>
<td>196</td>
<td>57.0</td>
<td>194</td>
<td>57.4</td>
</tr>
<tr>
<td>482.sphinx3</td>
<td>539</td>
<td>36.2</td>
<td>539</td>
<td>36.1</td>
<td>539</td>
<td>36.2</td>
</tr>
</tbody>
</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 DL380 Gen10
(1.70 GHz, Intel Xeon Bronze 3104)

| SPECfp2006 = | 69.8 |
| SPECfp_base2006 = | 68.6 |

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

Test date: Nov-2017
Hardware Availability: Oct-2017
Software Availability: Sep-2017

Platform Notes (Continued)

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 linux-b7s1 Tue Nov 21 21:16:05 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) Bronze 3104 CPU @ 1.70GHz
  2 "physical id"s (chips)
  12 "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 : 6
  siblings : 6
  physical 0: cores 0 1 2 3 4 5
  physical 1: cores 0 1 2 3 4 5
  cache size : 8448 KB

From /proc/meminfo
  MemTotal: 197751480 kB
  HugePages_Total: 0
  Hugepagesize: 2048 kB

/usr/bin/lsb_release -d
  SUSE Linux Enterprise Server 12 SP3

From /etc/*release* /etc/*version*
  SuSE-release:
    SUSLE-release:
      SUSLE Linux Enterprise Server 12 (x86_64)
      VERSION = 12
      PATCHLEVEL = 3
      # 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"
    VERSION="12-SP3"
    VERSION_ID="12.3"
    PRETTY_NAME="SUSE Linux Enterprise Server 12 SP3"
    ID="sles"
    ANSI_COLOR="0;32"
    CPE_NAME="cpe:/o:suse:sles:12:sp3"

uname -a:
Hewlett Packard Enterprise  
(Test Sponsor: HPE)  
ProLiant DL380 Gen10  
(1.70 GHz, Intel Xeon Bronze 3104)  

SPECfp2006 = 69.8  
SPECfp_base2006 = 68.6  

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

Test date: Nov-2017  
Hardware Availability: Oct-2017  
Software Availability: Sep-2017  

Platform Notes (Continued)  

Linux linux-b7s1 4.4.73-5-default #1 SMP Tue Jul 4 15:33:39 UTC 2017  
(b7ce4e4) x86_64 x86_64 x86_64 GNU/Linux  
run-level 3 Nov 21 12:29  
SPEC is set to: /home/cpu2006  
Filesystem Type Size Used Avail Use% Mounted on  
/dev/sda4 xfs 852G 42G 811G 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 U30 10/11/2017  
Memory:  
24x UNKNOWN NOT AVAILABLE 8 GB 2 rank 2666 MHz, configured at 2133 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 = "12"  

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

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
SPEC CFP2006 Result

Hewlett Packard Enterprise
(Test Sponsor: HPE)
ProLiant DL380 Gen10
(1.70 GHz, Intel Xeon Bronze 3104)

SPECfp2006 = 69.8
SPECfp_base2006 = 68.6

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

Base Portability Flags

410.bwaves: -DSPEC_CPU_LP64
416.gamest: -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

Peak Compiler Invocation

C benchmarks:
icc -m64

C++ benchmarks:
icpc -m64

Fortran benchmarks:
ifort -m64

Benchmarks using both Fortran and C:
icc -m64 ifort -m64
Hewlett Packard Enterprise
(Test Sponsor: HPE)
ProLiant DL380 Gen10
(1.70 GHz, Intel Xeon Bronze 3104)

SPECfp2006 = 69.8
SPECfp_base2006 = 68.6

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

Test date: Nov-2017
Hardware Availability: Oct-2017
Software Availability: Sep-2017

Peak Portability Flags

Same as Base Portability Flags

Peak Optimization Flags

C benchmarks:

433.milc: basepeak = yes
470.lbm: basepeak = yes
482.sphinx3: basepeak = yes

C++ benchmarks:

444.namd: -prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX2(pass 2)
-par-num-threads=1(pass 1) -ipo(pass 2) -O3(pass 2)
-no-prec-div(pass 2) -fno-alias -auto-ilp32

447.dealII: basepeak = yes
450.soplex: basepeak = yes
453.povray: -prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX2(pass 2)
-par-num-threads=1(pass 1) -ipo(pass 2) -O3(pass 2)
-no-prec-div(pass 2) -unroll4 -ansi-alias

Fortran benchmarks:

410.bwaves: basepeak = yes
416.gamess: -prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX2(pass 2)
-par-num-threads=1(pass 1) -ipo(pass 2) -O3(pass 2)
-no-prec-div(pass 2) -unroll2 -inline-level=0 -scalar-rep-

434.zeusmp: basepeak = yes
437.leslie3d: basepeak = yes
459.GemsFDTD: -prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX2(pass 2)
-par-num-threads=1(pass 1) -ipo(pass 2) -O3(pass 2)
-no-prec-div(pass 2) -unroll2 -inline-level=0 
-qopt-prefetch -parallel

465.tonto: -prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX2(pass 2)
-par-num-threads=1(pass 1) -ipo(pass 2) -O3(pass 2)
-no-prec-div(pass 2) -inline-calloc -qopt-malloc-options=3
-auto -unroll4

Continued on next page
Hewlett Packard Enterprise
(Test Sponsor: HPE)
ProLiant DL380 Gen10
(1.70 GHz, Intel Xeon Bronze 3104)

SPECfp2006 = 69.8
SPECfp_base2006 = 68.6

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

Peak Optimization Flags (Continued)

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
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-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 14 January 2018.