### SPEC® CFP2006 Result

**Hewlett Packard Enterprise**  
(Test Sponsor: HPE)  
**ProLiant DL580 Gen10**  
(2.10 GHz, Intel Xeon Gold 6130)

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

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

<table>
<thead>
<tr>
<th>Copies</th>
<th>150</th>
<th>300</th>
<th>450</th>
<th>600</th>
<th>750</th>
<th>900</th>
<th>1050</th>
<th>1200</th>
<th>1350</th>
<th>1500</th>
<th>1650</th>
<th>1800</th>
<th>1950</th>
<th>2100</th>
<th>2250</th>
<th>2400</th>
<th>2550</th>
<th>2700</th>
<th>2850</th>
<th>3000</th>
<th>3150</th>
<th>3300</th>
<th>3450</th>
<th>3600</th>
<th>3750</th>
</tr>
</thead>
<tbody>
<tr>
<td>410.bwaves</td>
<td>128</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>416.gamess</td>
<td>128</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>433.milc</td>
<td>128</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>434.zeusmp</td>
<td>128</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>435.gromacs</td>
<td>128</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>436.cactusADM</td>
<td>128</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>437.leslie3d</td>
<td>128</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>444.namd</td>
<td>128</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>447.dealII</td>
<td>128</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>450.soplex</td>
<td>128</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>453.povray</td>
<td>128</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>454.calculix</td>
<td>128</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>459.GemsFDTD</td>
<td>128</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>465.tonto</td>
<td>128</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>470.lbm</td>
<td>128</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>481.wrf</td>
<td>128</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>482.sphinx3</td>
<td>128</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Hardware**

<table>
<thead>
<tr>
<th>CPU Name:</th>
<th>Intel Xeon Gold 6130</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU Characteristics:</td>
<td>Intel Turbo Boost Technology up to 3.70 GHz</td>
</tr>
<tr>
<td>CPU MHz:</td>
<td>2100</td>
</tr>
<tr>
<td>FPU:</td>
<td>Integrated</td>
</tr>
<tr>
<td>CPU(s) enabled:</td>
<td>64 cores, 4 chips, 16 cores/chip, 2 threads/core</td>
</tr>
<tr>
<td>CPU(s) orderable:</td>
<td>1, 2, 4 chip(s)</td>
</tr>
<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>
</tbody>
</table>

**Software**

<table>
<thead>
<tr>
<th>Operating System:</th>
<th>SUSE Linux Enterprise Server 12 (x86_64) SP3</th>
</tr>
</thead>
<tbody>
<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>
</tr>
<tr>
<td>Auto Parallel:</td>
<td>No</td>
</tr>
<tr>
<td>File System:</td>
<td>xfs</td>
</tr>
<tr>
<td>System State:</td>
<td>Run level 3 (multi-user)</td>
</tr>
</tbody>
</table>

**Copy** SPECfp_rate_base2006 = 1990
Hewlett Packard Enterprise
(Test Sponsor: HPE)
ProLiant DL580 Gen10
(2.10 GHz, Intel Xeon Gold 6130)

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

SPECfp_rate2006 = Not Run
SPECfp_rate_base2006 = 1990

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

L3 Cache: 22 MB I+D on chip per chip
Other Cache: None
Memory: 1 TB (16 x 64 GB 4Rx4 PC4-2666V-L)
Disk Subsystem: 1 x 600 GB SSD SATA, 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>Base Pointers</th>
<th>Peak Pointers</th>
<th>Other Software</th>
</tr>
</thead>
<tbody>
<tr>
<td>410.bwaves</td>
<td>128</td>
<td>1228</td>
<td>420</td>
<td>1227</td>
<td>1420</td>
<td></td>
</tr>
<tr>
<td>416.gamess</td>
<td>128</td>
<td>1022</td>
<td>2450</td>
<td>1024</td>
<td>2450</td>
<td>1020</td>
</tr>
<tr>
<td>433.milc</td>
<td>128</td>
<td>852</td>
<td>1380</td>
<td>850</td>
<td>1380</td>
<td>851</td>
</tr>
<tr>
<td>434.zeusmp</td>
<td>128</td>
<td>491</td>
<td>2370</td>
<td>491</td>
<td>2370</td>
<td>491</td>
</tr>
<tr>
<td>435.gromacs</td>
<td>128</td>
<td>306</td>
<td>2990</td>
<td>306</td>
<td>2990</td>
<td>302</td>
</tr>
<tr>
<td>436.cactusADM</td>
<td>128</td>
<td>607</td>
<td>2520</td>
<td>606</td>
<td>2520</td>
<td>607</td>
</tr>
<tr>
<td>437.leslie3d</td>
<td>128</td>
<td>1181</td>
<td>1020</td>
<td>1180</td>
<td>1020</td>
<td>1180</td>
</tr>
<tr>
<td>444.namd</td>
<td>128</td>
<td>504</td>
<td>2040</td>
<td>505</td>
<td>2030</td>
<td>504</td>
</tr>
<tr>
<td>447.dealII</td>
<td>128</td>
<td>391</td>
<td>3750</td>
<td>395</td>
<td>3710</td>
<td>391</td>
</tr>
<tr>
<td>450.soplex</td>
<td>128</td>
<td>1007</td>
<td>1060</td>
<td>1009</td>
<td>1060</td>
<td>1007</td>
</tr>
<tr>
<td>453.povray</td>
<td>128</td>
<td>208</td>
<td>3270</td>
<td>208</td>
<td>3270</td>
<td>202</td>
</tr>
<tr>
<td>454.calculix</td>
<td>128</td>
<td>298</td>
<td>3540</td>
<td>299</td>
<td>3540</td>
<td>298</td>
</tr>
<tr>
<td>459.GemsFDTD</td>
<td>128</td>
<td>1415</td>
<td>960</td>
<td>1417</td>
<td>959</td>
<td>1416</td>
</tr>
<tr>
<td>465.tonto</td>
<td>128</td>
<td>547</td>
<td>2300</td>
<td>548</td>
<td>2300</td>
<td>556</td>
</tr>
<tr>
<td>470.lbm</td>
<td>128</td>
<td>905</td>
<td>1940</td>
<td>905</td>
<td>1940</td>
<td>907</td>
</tr>
<tr>
<td>481.wrf</td>
<td>128</td>
<td>830</td>
<td>1720</td>
<td>826</td>
<td>1730</td>
<td>826</td>
</tr>
<tr>
<td>482.sphinx3</td>
<td>128</td>
<td>1292</td>
<td>1930</td>
<td>1295</td>
<td>1930</td>
<td>1293</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"
Prior to runcpu invocation
Filesystem page cache synced and cleared with:
  sync; echo 3>/proc/sys/vm/drop_caches
runcspec command invoked through numactl i.e.:
  numactl --interleave=all runcspec <etc>
## Platform Notes

**BIOS Configuration:**
- Thermal Configuration set to Maximum Cooling
- Memory Patrol Scrubbing set to Disabled
- LLC Prefetcher set to Enabled
- LLC Dead Line Allocation set to Disabled
- Workload Profile set to Throughput Frequency 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 (b5e8d4b4eb51ed28d7f98696cbe290c1)
running on linux-0nki Mon Oct 30 07:06:36 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)`
- `128 "processors"`
- `coress, 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`: 32
  - `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`: 1056517044 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:
  SUSE 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"`
SPECFp_rate2006 = Not Run
SPECFp_rate_base2006 = 1990

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

Platform Notes (Continued)

PRETTY_NAME="SUSE Linux Enterprise Server 12 SP3"
ID="sles"
ANSI_COLOR="0;32"
CPE_NAME="cpe:/o:suse:sles:12:sp3"

uname -a:
    Linux linux-0nki 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 Oct 30 07:04
SPEC is set to: /home/cpu2006
Filesystem     Type  Size  Used Avail Use% Mounted on
/dev/sda4      xfs   517G   92G  426G  18% /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 08/18/2017
Memory:
32x UNKNOWN NOT AVAILABLE
16x UNKNOWN NOT AVAILABLE 64 GB 4 rank 2666 MHz

(End of data from sysinfo program)
Regarding the sysinfo display about the memory installed, the correct amount of
memory is 1 TB and the dmidecode description should have one line reading as:
16x UNKNOWN NOT AVAILABLE 64 GB 4 rank 2666

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

Base Compiler Invocation

C benchmarks:
   icc -m64
C++ benchmarks:
   icpc -m64
Fortran benchmarks:
   ifort -m64
SPEC CFP2006 Result

Hewlett Packard Enterprise
(Test Sponsor: HPE)
ProLiant DL580 Gen10
(2.10 GHz, Intel Xeon Gold 6130)

SPECfp_rate2006 = Not Run
SPECfp_rate_base2006 = 1990

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

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

Base Compiler Invocation (Continued)

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 -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-revD.html
### SPEC CFP2006 Result

**Hewlett Packard Enterprise**  
(Test Sponsor: HPE)  
ProLiant DL580 Gen10  
(2.10 GHz, Intel Xeon Gold 6130)

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECfp_rate2006</td>
<td>Not Run</td>
</tr>
<tr>
<td>SPECfp_rate_base2006</td>
<td>1990</td>
</tr>
<tr>
<td>CPU2006 license</td>
<td>3</td>
</tr>
<tr>
<td>Test sponsor</td>
<td>HPE</td>
</tr>
<tr>
<td>Tested by</td>
<td>HPE</td>
</tr>
</tbody>
</table>

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

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

- http://www.spec.org/cpu2006/flags/HPE-Platform-Flags-Intel-V1.2-SKX-revD.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.  