## SPEC® CFP2006 Result

### Hewlett Packard Enterprise

**Test Sponsor:** HPE  
**ProLiant DL360 Gen10**  
(2.00 GHz, Intel Xeon Platinum 8164)

<table>
<thead>
<tr>
<th>SPECfp®_rate2006 = Not Run</th>
<th>SPECfp_rate_base2006 = 1520</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CPU2006 license:</strong> 3</td>
<td><strong>Test date:</strong> Oct-2017</td>
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<td><strong>Software Availability:</strong> Apr-2017</td>
</tr>
</tbody>
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**Hardware**
- **CPU Name:** Intel Xeon Platinum 8164  
- **CPU Characteristics:** Intel Turbo Boost Technology up to 3.70 GHz  
- **CPU MHz:** 2000  
- **FPU:** Integrated  
- **CPU(s) enabled:** 52 cores, 2 chips, 26 cores/chip, 2 threads/core  
- **CPU(s) orderable:** 1, 2 chip(s)  
- **Primary Cache:** 32 KB I + 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) SP2  
  Kernel 4.4.21-68-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:** No  
- **File System:** xfs  
- **System State:** Run level 3 (multi-user)

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### CactusADM
- **410.bwaves** 104
- **416.gamess** 104
- **435.gromacs** 104
- **436.cactusADM** 104
- **437.leslie3d** 104
- **444.namd** 104
- **447.dealII** 104
- **450.soplex** 104
- **453.povray** 104
- **454.calculix** 104
- **459.GemsFDTD** 104
- **465.tonto** 104
- **470.lbm** 104
- **481.wrf** 104
- **482.sphinx3** 104

**Copies**

|    | 100 | 200 | 300 | 400 | 500 | 600 | 700 | 800 | 900 | 1000 | 1100 | 1200 | 1300 | 1400 | 1500 | 1600 | 1700 | 1800 | 1900 | 2000 | 2100 | 2200 | 2300 | 2400 | 2500 | 2600 | 2700 | 2800 |
|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| 410.bwaves | 104 |     |     |     |     |     |     |     |     |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| 416.gamess  | 104 |     |     |     |     |     |     |     |     |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| 433.milc    | 104 |     |     |     |     |     |     |     |     |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| 434.zeusmp  | 104 |     |     |     |     |     |     |     |     |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| 435.gromacs | 104 |     |     |     |     |     |     |     |     |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| 436.cactusADM | 104 |     |     |     |     |     |     |     |     |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| 437.leslie3d | 104 |     |     |     |     |     |     |     |     |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| 444.namd    | 104 |     |     |     |     |     |     |     |     |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| 447.dealII  | 104 |     |     |     |     |     |     |     |     |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| 450.soplex  | 104 |     |     |     |     |     |     |     |     |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| 453.povray  | 104 |     |     |     |     |     |     |     |     |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| 454.calculix | 104 |     |     |     |     |     |     |     |     |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| 459.GemsFDTD | 104 |     |     |     |     |     |     |     |     |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| 465.tonto   | 104 |     |     |     |     |     |     |     |     |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| 470.lbm     | 104 |     |     |     |     |     |     |     |     |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| 481.wrf     | 104 |     |     |     |     |     |     |     |     |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| 482.sphinx3 | 104 |     |     |     |     |     |     |     |     |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |

**SPECfp_rate_base2006 = 1520**
**SPEC CFP2006 Result**

Hewlett Packard Enterprise  
(Test Sponsor: HPE)

ProLiant DL360 Gen10  
(2.00 GHz, Intel Xeon Platinum 8164)

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**SPECfp_rate2006 = Not Run**

**SPECfp_rate_base2006 = 1520**

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### CPU2006 license: 3

- **Test sponsor:** HPE  
- **Tested by:** HPE

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### Hardware Availability:

- **Test date:** Oct-2017
- **SoftwareAvailability:** Apr-2017

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### Other Hardware:

- **L3 Cache:** 35.75 MB I+D on chip per chip  
- **Other Cache:** None  
- **Memory:** 192 GB (24 x 8 GB 2Rx8 PC4-2666V-R)  
- **Disk Subsystem:** 1 x 400 GB SATA SSD, RAID 0  
- **Other Hardware:** None

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### Base Pointers:

- **32/64-bit**

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### Results Table

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**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 "service irqbalance stop"

    tuned profile set with "tuned-adm profile throughput-performance"
```

Continued on next page
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**SPECfp_rate2006 = Not Run**

**SPECfp_rate_base2006 = 1520**

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
LLC Prefetch set to Enabled
LLC Dead Line Allocation set to Disabled
Memory Patrol Scrubbing set to Disabled
Workload Profile set to General Throughput Compute
Minimum Processor Idle Power Core C-State set to C1E
Sysinfo program /home/cpu2006/config/sysinfo.rev6993
Revision 6993 of 2015-11-06 (b5e8d4b4eb51ed28d7f98696cbe290c1)
running on linux-rugf Thu Oct 26 11:56:28 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) Platinum 8164 CPU @ 2.00GHz
2 "physical id"s (chips)
104 "processors"
cores, siblings (Caution: counting these is hw and system dependent. The
following excerpts from /proc/cpuinfo might not be reliable. Use with
cautions.)
cpu cores : 26
siblings : 52
physical 0: cores 0 1 2 3 8 9 10 11 12 13 16 17 18 19 20 21 22 24 25 26 27
   28 29
physical 1: cores 0 1 2 3 8 9 10 11 12 13 16 17 18 19 20 21 22 24 25 26 27
   28 29
cache size : 36608 KB

From /proc/meminfo
MemTotal: 197736612 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"
VERSION="12-SP2"

Continued on next page
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SPECFp_rate2006 = Not Run
SPECFp_rate_base2006 = 1520

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

Platform Notes (Continued)

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-rugf 4.4.21-68-default #1 SMP Tue Oct 18 18:19:37 UTC 2016
(63cf368) x86_64 x86_64 x86_64 GNU/Linux
unlevel 3 Oct 26 05:31

SPEC is set to: /home/cpu2006
Filesystem Type Size Used Avail Use% Mounted on
/dev/nvme0n1p4 xfs 331G 115G 216G 35% /home

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 U32 09/29/2017
Memory:
24x UNKNOWN NOT AVAILABLE 8 GB 2 rank 2666 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

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
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### Base Portability Flags

- 410.bwaves: -DSPEC_CPU_LP64
- 416.games: -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
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- 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/HPE-Platform-Flags-Intel-V1.2-SKX-revF.html

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-revF.xml

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Standard Performance Evaluation Corporation  
info@spec.org  
http://www.spec.org/
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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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