### SPEC® CFP2006 Result

**Hewlett Packard Enterprise**  
[Test Sponsor: HPE]

**ProLiant DL560 Gen10**  
(2.70 GHz, Intel Xeon Gold 6150)

<table>
<thead>
<tr>
<th>SPECfp®_rate2006</th>
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<tr>
<td>SPECfp_rate_base2006</td>
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**CPU2006 license:** 3  
**Test sponsor:** HPE  
**Tested by:** HPE  
**Test date:** Nov-2017  
**Hardware Availability:** Oct-2017  
**Software Availability:** Apr-2017

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| Operating System: SUSE Linux Enterprise Server 12 (x86_64) SP2  
Kernel 4.4.21-69-default | CPU Name: Intel Xeon Gold 6150  
CPU Characteristics: Intel Turbo Boost Technology up to 3.70 GHz  
CPU MHz: 2700 |
| 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 | FPU: Integrated  
CPU(s) enabled: 72 cores, 4 chips, 18 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 |
| Auto Parallel: No | File System: xfs |
| System State: Run level 3 (multi-user) |

| Copies | 200 | 400 | 600 | 800 | 1000 | 1300 | 1600 | 1900 | 2200 | 2500 | 2800 | 3100 | 3400 | 3700 | 4000 | 4300 | 4600 | 4900 | 5200 |
|--------|-----|-----|-----|-----|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| 410.bwaves | 144 | 2040 |
| 416.gamess | 144 | 3210 |
| 433.milc | 144 | 2010 |
| 434.zeusmp | 144 | 3410 |
| 435.gromacs | 144 | 4040 |
| 436.cactusADM | 144 | 3710 |
| 437.leslie3d | 144 | 1520 |
| 444.namd | 144 | 2660 |
| 447.dealII | 144 | 5060 |
| 450.soplex | 144 | 1540 |
| 453.povray | 144 | 4430 |
| 454.calculix | 144 | 4760 |
| 459.GemsFDTD | 144 | 1410 |
| 465.tonto | 144 | 3130 |
| 470.lbm | 144 | 2830 |
| 481.wrf | 144 | 2520 |
| 482.sphinx3 | 144 | 2690 |

**SPECfp_rate_base2006 = 2790**
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**SPECfp_rate2006 = Not Run**  
**SPECfp_rate_base2006 = 2790**

### Results Table

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<tr>
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<th>Ratio</th>
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<tbody>
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<tr>
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</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  
runcspec 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
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
Stale A to S set to Enabled
Memory Patrol Scrubbing 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 (b5e8d4b4eb51ed28d7f98696cbe290c1)
running on linux-z88l Thu Nov 30 14:18:47 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 6150 CPU @ 2.70GHz
  4 "physical id"s (chips)
  144 "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 : 18
    siblings : 36
    physical 0: cores 0 1 2 3 8 9 10 11 16 17 18 19 20 24 25 26 27
    physical 1: cores 0 1 2 3 8 9 10 11 16 17 18 19 20 24 25 26 27
    physical 2: cores 0 1 2 3 8 9 10 11 16 17 18 19 20 24 25 26 27
    physical 3: cores 0 1 2 3 8 9 10 11 16 17 18 19 20 24 25 26 27
  cache size : 25344 KB

From /proc/meminfo
MemTotal: 792273344 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.

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Platform Notes (Continued)

# Please check /etc/os-release for details about this release.
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:
Linux linux-z88l 4.4.21-69-default #1 SMP Tue Oct 25 10:58:20 UTC 2016
(9464f67) x86_64 x86_64 x86_64 GNU/Linux

run-level 3 Nov 29 14:56

SPEC is set to: /home/cpu2006
Filesystem   Type Size  Used Avail Use% Mounted on
/dev/sdb4    xfs   400G  143G  258G  36% /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 09/29/2017
Memory:
48x UNKNOWN NOT AVAILABLE 16 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

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Base Compiler Invocation (Continued)

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
- 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
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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-revH.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/HPE-Platform-Flags-Intel-V1.2-SKX-revH.xml](http://www.spec.org/cpu2006/flags/HPE-Platform-Flags-Intel-V1.2-SKX-revH.xml)

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For other inquiries, please contact webmaster@spec.org.

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