## SPEC® CFP2006 Result

**Hewlett Packard Enterprise**  
(Test Sponsor: HPE)  
ProLiant DL360 Gen10  
(3.50 GHz, Intel Xeon Gold 6144)  

<table>
<thead>
<tr>
<th>SPECfp®2006 =</th>
<th>Not Run</th>
</tr>
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<tbody>
<tr>
<td>SPECfp_base2006 =</td>
<td>150</td>
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</table>

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

### Hardware

<table>
<thead>
<tr>
<th>Component</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU Name:</td>
<td>Intel Xeon Gold 6144</td>
</tr>
<tr>
<td>CPU Characteristics:</td>
<td>Intel Turbo Boost Technology up to 4.20 GHz</td>
</tr>
<tr>
<td>CPU MHz:</td>
<td>3500</td>
</tr>
<tr>
<td>FPU:</td>
<td>Integrated</td>
</tr>
<tr>
<td>CPU(s) enabled:</td>
<td>16 cores, 2 chips, 8 cores/chip</td>
</tr>
<tr>
<td>CPU(s) orderable:</td>
<td>1, 2 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>
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### Software

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>Operating System:</td>
<td>Red Hat Enterprise Linux Server release 7.3 (Maipo), Kernel 3.10.0-514.el7.x86_64</td>
</tr>
<tr>
<td>Compiler:</td>
<td>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>Yes</td>
</tr>
<tr>
<td>File System:</td>
<td>xfs</td>
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</table>

### Test Details

- **Test date:** Nov-2017  
- **Hardware Availability:** Oct-2017  
- **Software Availability:** Apr-2017

### Test Results

<table>
<thead>
<tr>
<th>Application</th>
<th>Result</th>
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<tr>
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<td>54.6</td>
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<tr>
<td>433.milc</td>
<td>92.6</td>
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<tr>
<td>434.zeusmp</td>
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<td>435.gromacs</td>
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<tr>
<td>436.cactusADM</td>
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<tr>
<td>437.leslie3d</td>
<td>500</td>
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<tr>
<td>444.namd</td>
<td>40.4</td>
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<td>447.dealII</td>
<td>80.2</td>
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<tr>
<td>450.soplex</td>
<td>56.4</td>
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<td>78.6</td>
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<td>78.4</td>
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<tr>
<td>459.GemsFDTD</td>
<td>275</td>
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<tr>
<td>465.tonto</td>
<td>61.4</td>
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<tr>
<td>470.lbm</td>
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<tr>
<td>481.wrf</td>
<td>140</td>
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<tr>
<td>482.sphinx3</td>
<td>83.9</td>
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SPECfp_base2006 = 150

Continued on next page
Hewlett Packard Enterprise
(Test Sponsor: HPE)
ProLiant DL360 Gen10
(3.50 GHz, Intel Xeon Gold 6144)

SPECfp2006 = Not Run
SPECfp_base2006 = 150

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

L3 Cache: 24.75 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 480 GB SATA SSD, RAID 0
Other Hardware: None

System State: Run level 3 (multi-user)
Base Pointers: 64-bit
Peak Pointers: Not Applicable
Other Software: None

Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Seconds</th>
<th>Ratio</th>
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<tbody>
<tr>
<td>410.bwaves</td>
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<tr>
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<td>481.wrf</td>
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<td>83.3</td>
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</tbody>
</table>

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

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:
Intel Hyperthreading set to Disabled
Thermal Configuration set to Maximum Cooling
LLC Prefetch set to Enabled
LLC Dead Line Allocation set to Disabled

Continued on next page
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**SPECfp2006 = Not Run**
**SPECfp_base2006 = 150**

**CPU2006 license:** 3
**Test sponsor:** HPE
**Test date:** Nov-2017
**Hardware Availability:** Oct-2017
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**Software Availability:** Apr-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/specuser/cpu2006/config/sysinfo.rev6993
Revision 6993 of 2015-11-06 (b5e8d4b4eb51ed28d7f98696cbe290c1)
running on dl360gen10rhel73 Wed Nov 22 11:06:17 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 6144 CPU @ 3.50GHz
- 2 "physical id"s (chips)
- 16 "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: 8
  - siblings: 8
  - physical 0: cores 0 2 3 9 16 19 26 27
  - physical 1: cores 0 2 3 9 16 19 26 27
- cache size: 25344 KB

From /proc/meminfo
- MemTotal: 197574320 kB
- HugePages_Total: 0
- Hugepagesize: 2048 kB

From /etc/*release*/etc/*version*
- os-release:
  - NAME="Red Hat Enterprise Linux Server"
  - VERSION="7.3 (Maipo)"
  - ID="rhel"
  - ID_LIKE="fedora"
  - VERSION_ID="7.3"
  - PRETTY_NAME="Red Hat Enterprise Linux Server 7.3 (Maipo)"
  - ANSI_COLOR="0;31"
  - CPE_NAME="cpe:/o:redhat:enterprise_linux:7.3:GA:server"
- redhat-release: Red Hat Enterprise Linux Server release 7.3 (Maipo)
- system-release: Red Hat Enterprise Linux Server release 7.3 (Maipo)

uname -a:
- Linux dl360gen10rhel73 3.10.0-514.el7.x86_64 #1 SMP Wed Oct 19 11:24:13 EDT 2016 x86_64 x86_64 x86_64 GNU/Linux

run-level 3 Nov 22 10:53

SPEC is set to: /home/specuser/cpu2006

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Platform Notes (Continued)

Filesystem Type Size Used Avail Use% Mounted on
/dev/mapper/rhel-home xfs 392G 37G 356G 10% /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 U32 09/29/2017
Memory:
24x UNKNOWN NOT AVAILABLE 8 GB 2 rank 2666 MHz

(End of data from sysinfo program)
Regarding the sysinfo display about the memory installed, the correct amount of
memory is 192 GB and the dmidecode description should have one line reading as:
24x UNKNOWN NOT AVAILABLE 8 GB 2 rank 2666 MHz

General Notes

Environment variables set by runspec before the start of the run:
KMP_AFFINITY = "granularity=core,compact"
LD_LIBRARY_PATH = "/home/specuser/cpu2006/lib/ia32:/home/specuser/cpu2006/lib/intel64:/home/specuser/cpu2006/sh10.2"
OMP_NUM_THREADS = "16"

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

Base Portability Flags

410.bwaves: -DSPEC_CPU_LP64
416.gamess: -DSPEC_CPU_LP64

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### Base Portability Flags (Continued)

- 433.milc: -DSPEC_CPU_LP64  
- 434.zesump: -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 -nofor_main  
- 454.calculix: -DSPEC_CPU_LP64 -nofor_main  
- 459.GemsFD3D: -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

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-SKK-revG.html](http://www.spec.org/cpu2006/flags/HPE-Platform-Flags-Intel-V1.2-SKK-revG.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-SKK-revG.xml](http://www.spec.org/cpu2006/flags/HPE-Platform-Flags-Intel-V1.2-SKK-revG.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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