Hewlett Packard Enterprise
(Test Sponsor: HPE)
ProLiant DL560 Gen10
(2.30 GHz, Intel Xeon Platinum 8165)

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

SPECint®_rate2006 = Not Run
SPECint_rate_base2006 = 4470

CPU Name: Intel Xeon Platinum 8165
CPU Characteristics: Intel Turbo Boost Technology up to 3.70 GHz
CPU MHz: 2300
FPU: Integrated
CPU(s) enabled: 96 cores, 4 chips, 24 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
L3 Cache: 33 MB I+D on chip per chip
Other Cache: None
Memory: 384 GB (48 x 8 GB 2Rx8 PC4-2666V-R)
Disk Subsystem: 1 x 960 GB SATA SSD, RAID 0
Other Hardware: None

Operating System: SUSE Linux Enterprise Server 12 (x86_64) SP2
Compiler: C/C++: Version 18.0.0.128 of Intel C/C++ Compiler for Linux
Auto Parallel: No
File System: xfs
System State: Run level 3 (multi-user)
Base Pointers: 32-bit
Peak Pointers: Not Applicable
Other Software: Microquill SmartHeap V10.2

Software

Hardware

**HPC**

**Copies**

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Copies</th>
<th>SPECint_rate_base2006</th>
</tr>
</thead>
<tbody>
<tr>
<td>400.perlbench</td>
<td>192</td>
<td>3330</td>
</tr>
<tr>
<td>401.bzip2</td>
<td>192</td>
<td>2020</td>
</tr>
<tr>
<td>403.gcc</td>
<td>192</td>
<td>3110</td>
</tr>
<tr>
<td>429.mcf</td>
<td>192</td>
<td>5760</td>
</tr>
<tr>
<td>445.gobmk</td>
<td>192</td>
<td>2910</td>
</tr>
<tr>
<td>456.hmmer</td>
<td>192</td>
<td>6140</td>
</tr>
<tr>
<td>458.sjeng</td>
<td>192</td>
<td>3030</td>
</tr>
<tr>
<td>462.libquantum</td>
<td>192</td>
<td>80700</td>
</tr>
<tr>
<td>464.h264ref</td>
<td>192</td>
<td>5080</td>
</tr>
<tr>
<td>471.omnetpp</td>
<td>192</td>
<td>2170</td>
</tr>
<tr>
<td>473.astar</td>
<td>192</td>
<td>2360</td>
</tr>
<tr>
<td>483.xalancbmk</td>
<td>192</td>
<td>4640</td>
</tr>
</tbody>
</table>
Hewlett Packard Enterprise
(Test Sponsor: HPE)
ProLiant DL560 Gen10
(2.30 GHz, Intel Xeon Platinum 8165)

SPEC CINT2006 Result

SPECint_rate2006 = Not Run
SPECint_rate_base2006 = 4470

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

Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Copies</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Copies</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>400.perlbench</td>
<td>192</td>
<td>564</td>
<td>3330</td>
<td>562</td>
<td>3340</td>
<td>563</td>
<td>3330</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>401.bzip2</td>
<td>192</td>
<td>918</td>
<td>2020</td>
<td>914</td>
<td>2030</td>
<td>916</td>
<td>2020</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>403.gcc</td>
<td>192</td>
<td>496</td>
<td>3110</td>
<td>497</td>
<td>3110</td>
<td>496</td>
<td>3120</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>429.mcf</td>
<td>192</td>
<td>303</td>
<td>5780</td>
<td>304</td>
<td>5750</td>
<td>304</td>
<td>5760</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>445.gobmk</td>
<td>192</td>
<td>691</td>
<td>2910</td>
<td>684</td>
<td>2940</td>
<td>691</td>
<td>2910</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>456.hmmer</td>
<td>192</td>
<td>292</td>
<td>6140</td>
<td>292</td>
<td>6140</td>
<td>292</td>
<td>6130</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>458.sjeng</td>
<td>192</td>
<td>767</td>
<td>3030</td>
<td>767</td>
<td>3030</td>
<td>767</td>
<td>3030</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>462.libquantum</td>
<td>192</td>
<td>49.3</td>
<td>80700</td>
<td>49.3</td>
<td>80700</td>
<td>49.3</td>
<td>80700</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>464.h264ref</td>
<td>192</td>
<td>837</td>
<td>5080</td>
<td>833</td>
<td>5100</td>
<td>840</td>
<td>5060</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>471.omnetpp</td>
<td>192</td>
<td>555</td>
<td>2160</td>
<td>554</td>
<td>2170</td>
<td>553</td>
<td>2170</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>473.astar</td>
<td>192</td>
<td>570</td>
<td>2370</td>
<td>571</td>
<td>2360</td>
<td>571</td>
<td>2360</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>483.xalancbmk</td>
<td>192</td>
<td>288</td>
<td>4590</td>
<td>285</td>
<td>4650</td>
<td>286</td>
<td>4640</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></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"
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"
- 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

Continued on next page
## SPEC CINT2006 Result

**Hewlett Packard Enterprise**
*(Test Sponsor: HPE)*

**ProLiant DL560 Gen10**
*(2.30 GHz, Intel Xeon Platinum 8165)*

<table>
<thead>
<tr>
<th>CPU2006 license: 3</th>
<th>Test date: Nov-2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test sponsor: HPE</td>
<td>Hardware Availability: Dec-2017</td>
</tr>
<tr>
<td>Tested by: HPE</td>
<td>Software Availability: Sep-2017</td>
</tr>
</tbody>
</table>

**SPECint_rate2006 =** Not Run

**SPECint_rate_base2006 =** 4470

---

### Platform Notes (Continued)

Sysinfo program /home/cpu2006/config/sysinfo.rev6993
Revision 6993 of 2015-11-06 (b5e8d4b4eb51ed28d7f98696cbe290c1)
running on linux-g0wk Mon Nov 13 04:35:43 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 8165 CPU @ 2.30GHz
4 "physical id"s (chips)
192 "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 : 24
siblings : 48
physical 0: cores 0 1 2 3 8 9 10 11 12 13 16 17 18 19 20 21 24 25 26 27 28
physical 1: cores 0 1 2 3 8 9 10 11 12 13 16 17 18 19 20 21 24 25 26 27 28
physical 2: cores 0 1 2 3 8 9 10 11 12 13 16 17 18 19 20 21 24 25 26 27 28
physical 3: cores 0 1 2 3 8 9 10 11 12 13 16 17 18 19 20 21 24 25 26 27 28

cache size : 33792 KB

From /proc/meminfo
MemTotal:       395904408 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"
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-g0wk 4.4.21-68-default #1 SMP Tue Oct 18 18:19:37 UTC 2016
(63cf368) x86_64 x86_64 x86_64 GNU/Linux

Continued on next page
### Platform Notes (Continued)

run-level 3 Nov 13 04:33

SPEC is set to: /home/cpu2006

<table>
<thead>
<tr>
<th>Filesystem</th>
<th>Type</th>
<th>Size</th>
<th>Used</th>
<th>Avail</th>
<th>Use%</th>
<th>Mounted on</th>
</tr>
</thead>
<tbody>
<tr>
<td>/dev/sdb4</td>
<td>xfs</td>
<td>489G</td>
<td>36G</td>
<td>454G</td>
<td>8%</td>
<td>/home</td>
</tr>
</tbody>
</table>

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 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/libs/32:/home/cpu2006/libs/64:/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:
```bash
icc -m32 -L/opt/intel/compilers_and_libraries_2018.0.082/linux/lib/ia32
```

C++ benchmarks:
```bash
icpc -m32 -L/opt/intel/compilers_and_libraries_2018.0.082/linux/lib/ia32
```

### Base Portability Flags

- `400.perlbench`: `-D_FILE_OFFSET_BITS=64` `-DSPEC_CPU_LINUX_IA32`
- `401.bzip2`: `-D_FILE_OFFSET_BITS=64`
- `403.gcc`: `-D_FILE_OFFSET_BITS=64`
- `429.mcf`: `-D_FILE_OFFSET_BITS=64`
- `445.gobmk`: `-D_FILE_OFFSET_BITS=64`
- `456.hmmer`: `-D_FILE_OFFSET_BITS=64`
- `458.sjeng`: `-D_FILE_OFFSET_BITS=64`
- `462.libquantum`: `-D_FILE_OFFSET_BITS=64` `-DSPEC_CPU_LINUX`
- `464.h264ref`: `-D_FILE_OFFSET_BITS=64`

Continued on next page
 SPEC CINT2006 Result

Hewlett Packard Enterprise
(Test Sponsor: HPE)
ProLiant DL560 Gen10
(2.30 GHz, Intel Xeon Platinum 8165)

<table>
<thead>
<tr>
<th>SPECint_rate2006</th>
<th>Not Run</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECint_rate_base2006</td>
<td>4470</td>
</tr>
</tbody>
</table>

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

Base Portability Flags (Continued)

471.omnetpp: -D_FILE_OFFSET_BITS=64
473.astar: -D_FILE_OFFSET_BITS=64
483.xalancbmk: -D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LINUX

Base Optimization Flags

C benchmarks:
-xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch
-qopt-mem-layout-trans=3

C++ benchmarks:
-xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch
-qopt-mem-layout-trans=3 -Wl,-z,muldefs
-L/home/cpu2006/sh10.2 -lsmartheap

Base Other Flags

C benchmarks:
403.gcc: -Dalloca=_alloca

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 SPECint 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.