SPEC® CINT2006 Result

Hewlett Packard Enterprise
(Test Sponsor: HPE)
ProLiant DL560 Gen10
(2.40 GHz, Intel Xeon Gold 5115)

<table>
<thead>
<tr>
<th>SPECint®_rate2006 = Not Run</th>
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<tbody>
<tr>
<td>SPECint_rate_base2006 = 1960</td>
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CPU2006 license: 3
Test sponsor: HPE
Tested by: HPE

<table>
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<tr>
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<tbody>
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</tr>
<tr>
<td>Software Availability: Sep-2017</td>
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<table>
<thead>
<tr>
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<tr>
<td>80</td>
<td>1430</td>
</tr>
<tr>
<td>400.perlbench</td>
<td>80</td>
</tr>
<tr>
<td>401.bzip2</td>
<td>80</td>
</tr>
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<td>429.mcf</td>
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<td>445.gobmk</td>
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<td>80</td>
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<td>80</td>
</tr>
<tr>
<td>483.xalancbmk</td>
<td>80</td>
</tr>
</tbody>
</table>

Software

<table>
<thead>
<tr>
<th>Operating System: SUSE Linux Enterprise Server 12 (x86_64) SP2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kernel 4.4.21-68-default</td>
</tr>
<tr>
<td>Compiler: C/C++: Version 18.0.0.128 of Intel C/C++ Compiler for Linux</td>
</tr>
<tr>
<td>Auto Parallel: No</td>
</tr>
<tr>
<td>File System: xfs</td>
</tr>
<tr>
<td>System State: Run level 3 (multi-user)</td>
</tr>
<tr>
<td>Base Pointers: 32-bit</td>
</tr>
<tr>
<td>Peak Pointers: Not Applicable</td>
</tr>
<tr>
<td>Other Software: Microquill SmartHeap V10.2</td>
</tr>
</tbody>
</table>

Hardware

<table>
<thead>
<tr>
<th>CPU Name: Intel Xeon Gold 5115</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU Characteristics: Intel Turbo Boost Technology up to 3.20 GHz</td>
</tr>
<tr>
<td>CPU MHz: 2400</td>
</tr>
<tr>
<td>FPU: Integrated</td>
</tr>
<tr>
<td>CPU(s) enabled: 40 cores, 4 chips, 10 cores/chip, 2 threads/core</td>
</tr>
<tr>
<td>Secondary Cache: 32 KB I + 32 KB D on chip per core</td>
</tr>
<tr>
<td>Secondary Cache: 1 MB I+D on chip per core</td>
</tr>
<tr>
<td>L3 Cache: 13.75 MB I+D on chip per chip</td>
</tr>
<tr>
<td>Other Cache: None</td>
</tr>
<tr>
<td>Memory: 384 GB (48 x 8 GB 2Rx8 PC4-2666V-R, running at 2400)</td>
</tr>
<tr>
<td>Disk Subsystem: 1 x 960 GB SATA SSD, RAID 0</td>
</tr>
<tr>
<td>Other Hardware: None</td>
</tr>
</tbody>
</table>
**SPEC CINT2006 Result**

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

**ProLiant DL560 Gen10**
(2.40 GHz, Intel Xeon Gold 5115)

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**SPECint_rate_base2006 = 1960**

**CPU2006 license:** 3
**Test sponsor:** HPE
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<table>
<thead>
<tr>
<th>Benchmark</th>
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<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
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<tbody>
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<td>1400</td>
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<td>1420</td>
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<td>1420</td>
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<td><strong>903</strong></td>
<td>855</td>
<td>897</td>
<td>861</td>
<td>905</td>
<td>853</td>
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<td>474</td>
<td>1360</td>
<td><strong>465</strong></td>
<td>1380</td>
<td>464</td>
<td>1390</td>
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<tr>
<td>429.mcf</td>
<td>80</td>
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<td>2540</td>
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<td>2510</td>
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<td>80</td>
<td>740</td>
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<td>739</td>
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<td>462.libquantum</td>
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<td>464.h264ref</td>
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<td><strong>2150</strong></td>
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<td>2140</td>
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<td>471.omnetpp</td>
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<tr>
<td>473.astar</td>
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<td>528</td>
<td>1060</td>
<td><strong>535</strong></td>
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<td>253</td>
<td>2180</td>
<td><strong>257</strong></td>
<td><strong>2140</strong></td>
<td>259</td>
<td>2130</td>
</tr>
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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 "systemctl stop irqbalance"
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
  Memory Patrol Scrubbing set to Disabled
  LLC Prefetch set to Enabled
  LLC Dead Line Allocation 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
### Platform Notes (Continued)

Revision 6993 of 2015-11-06 (b5e8d4b4eb51ed28d7f98696cbe290c1) running on linux-y57o Tue Dec 12 12:52:18 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](http://www.spec.org/cpu2006/Docs/config.html#sysinfo)

From `/proc/cpuinfo`
- `model name`: Intel(R) Xeon(R) Gold 5115 CPU @ 2.40GHz
- `cache size`: 14080 KB

From `/proc/meminfo`
- `MemTotal`: 395922384 kB
- `HugePages_Total`: 0
- `Hugepagesize`: 2048 kB

From `/etc/*release* /etc/*version*`
- `NAME` = "SLES"
- `VERSION"="12-SP2"
- `PRETTY_NAME"="SUSE Linux Enterprise Server 12 SP2"

`uname -a`:
```
Linux linux-y57o 4.4.21-68-default #1 SMP Tue Oct 18 18:19:37 UTC 2016
(63cf36b) x86_64 x86_64 x86_64 GNU/Linux
```

run-level 3 Dec 12 12:42

SPEC is set to: `/home/cpu2006`

### SPEC CINT2006 Result

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Standard Performance Evaluation Corporation  
info@spec.org  
http://www.spec.org/
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Platform Notes (Continued)

/dev/sdc4 xfs 852G 37G 816G 5% /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 8 GB 2 rank 2666 MHz, configured at 2400 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

No: The test sponsor attests, as of date of publication, that CVE-2017-5754 (Meltdown) is mitigated in the system as tested and documented.
No: The test sponsor attests, as of date of publication, that CVE-2017-5753 (Spectre variant 1) is mitigated in the system as tested and documented.
No: The test sponsor attests, as of date of publication, that CVE-2017-5715 (Spectre variant 2) is mitigated in the system as tested and documented.

This benchmark result is intended to provide perspective on past performance using the historical hardware and/or software described on this result page.

The system as described on this result page was formerly generally available. At the time of this publication, it may not be shipping, and/or may not be supported, and/or may fail to meet other tests of General Availability described in the SPEC OSG Policy document, http://www.spec.org/osg/policy.htm.

This measured result may not be representative of the result that would be measured were this benchmark run with hardware and software available as of the publication date.

Base Compiler Invocation

C benchmarks:
  icc -m32 -L/opt/intel/compilers_and_libraries_2018.0.082/linux/lib/ia32

Continued on next page
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**Base Compiler Invocation (Continued)**

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

**Base Portability Flags**

400.perlbmk: -D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LINUX_IA32  
401.bzip2: -D_FILE_OFFSET_BITS=64  
403.gcc: -D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LINUX_IA32  
429.mcf: -D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LINUX  
445.gobmk: -D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LINUX  
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458.sjeng: -D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LINUX  
462.libquantum: -D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LINUX  
464.h264ref: -D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LINUX  
471.omnetpp: -D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LINUX  
473.astar: -D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LINUX  
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-SKK-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-SKK-revH.xml
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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 13 June 2018.