SPEC® CINT2006 Result

Hewlett Packard Enterprise
(Test Sponsor: HPE)

ProLiant BL460c Gen10
(2.40 GHz, Intel Xeon Gold 6148)

SPECint®2006 = Not Run
SPECint_base2006 = 75.8

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

CPU Name: Intel Xeon Gold 6148
CPU Characteristics: Intel Turbo Boost Technology up to 3.70 GHz
CPU MHz: 2400
FPU: Integrated
CPU(s) enabled: 40 cores, 2 chips, 20 cores/chip
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
L3 Cache: 27.5 MB I+D on chip per chip
Other Cache: None
Memory: 192 GB (12 x 16 GB 2Rx8 PC4-2666V-R)
Disk Subsystem: 2 x 480 GB SATA SSD, RAID 0
Other Hardware: None

Software
Operating System: Red Hat Enterprise Linux Server release 7.4 (Maipo)
Compiler: C/C++: Version 17.0.3.191 of Intel C/C++ Compiler for Linux
Auto Parallel: Yes
File System: xfs
System State: Run level 3 (multi-user)
Base Pointers: 32/64-bit
Peak Pointers: Not Applicable
Other Software: Microquill SmartHeap V10.2
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Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Base</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Peak</th>
<th>Seconds</th>
<th>Ratio</th>
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<tbody>
<tr>
<td>400.perlbench</td>
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<td>46.5</td>
<td>211</td>
<td>46.3</td>
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<td></td>
<td>211</td>
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<td>401.bzip2</td>
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<td>28.2</td>
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<td></td>
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<td>78.2</td>
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<tr>
<td>445.gobmk</td>
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<td>33.5</td>
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<td>33.5</td>
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<td>456.hmmer</td>
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<td>96.5</td>
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<td></td>
<td>96.6</td>
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<td>458.sjeng</td>
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<td>36.9</td>
<td></td>
<td></td>
<td>328</td>
<td>36.8</td>
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<tr>
<td>462.libquantum</td>
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<td>7940</td>
<td>2.49</td>
<td>8310</td>
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<tr>
<td>464.h264ref</td>
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<td>68.5</td>
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<td>471.omnetpp</td>
<td>159</td>
<td>39.4</td>
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<td>39.9</td>
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<td>40.6</td>
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<td></td>
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<td>473.astar</td>
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<td>39.0</td>
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<td>38.9</td>
<td>179</td>
<td>39.1</td>
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<td></td>
</tr>
<tr>
<td>483.xalancbmk</td>
<td>86.0</td>
<td>80.2</td>
<td>85.7</td>
<td>80.5</td>
<td>84.9</td>
<td>81.3</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.

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 Throughput-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
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/cpu2006/config/sysinfo.rev6993
Revision 6993 of 2015-11-06 (b5e8d4b4eb51ed28d7f98696cbe290c1)
runtime on bl160c15 Wed Dec 6 12:23:20 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

Continued on next page
Platform Notes (Continued)

From /proc/cpuinfo

    model name : Intel(R) Xeon(R) Gold 6148 CPU @ 2.40GHz
    2 "physical id"s (chips)
    40 "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 : 20
    siblings : 20
    physical 0: cores 0 1 2 3 4 8 9 10 11 12 16 17 18 19 20 24 25 26 27 28
    physical 1: cores 0 1 2 3 4 8 9 10 11 12 16 17 18 19 20 24 25 26 27 28
    cache size : 28160 KB

From /proc/meminfo

    MemTotal:       197748184 kB
    HugePages_Total:       0
    Hugepagesize:       2048 kB

From /etc/*release* /etc/*version*

    NAME="Red Hat Enterprise Linux Server"
    VERSION="7.4 (Maipo)"
    ID="rhel"
    ID_LIKE="fedora"
    VARIANT="Server"
    VARIANT_ID="server"
    VERSION_ID="7.4"
    PRETTY_NAME="Red Hat Enterprise Linux Server 7.4 (Maipo)"
    redhat-release: Red Hat Enterprise Linux Server release 7.4 (Maipo)
    system-release: Red Hat Enterprise Linux Server release 7.4 (Maipo)
    system-release-cpe: cpe:/o:redhat:enterprise_linux:7.4:ga:server

    uname -a:
    Linux bl160c15 3.10.0-693.el7.x86_64 #1 SMP Thu Jul 6 19:56:57 EDT 2017
    x86_64 x86_64 x86_64 GNU/Linux

    run-level 3 Dec 6 12:19

    SPEC is set to: /home/cpu2006
    Filesystem            Type  Size  Used Avail Use% Mounted on
    /dev/maper/rhel-home  xfs   839G   26G  813G   4% /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 I41 11/14/2017
    Memory:
    4x UNKNOWN NOT AVAILABLE
    12x UNKNOWN NOT AVAILABLE 16 GB 2 rank 2666 MHz
Continued on next page
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- **CPU2006 license:** 3  
- **Test date:** Dec-2017  
- **Test sponsor:** HPE  
- **HPE**  
- **Tested by:** HPE  
- **Hardware Availability:** Nov-2017  
- **Software Availability:** Sep-2017

### Platform Notes (Continued)

(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:  
12x UNKNOWN NOT AVAILABLE 16 GB 2 rank 2666 MHz

### General Notes

Environment variables set by runspec before the start of the run:
- `KMP_AFFINITY = "granularity=fine,compact"`
- `LD_LIBRARY_PATH = "/home/cpu2006/lib/ia32:/home/cpu2006/lib/intel64:/home/cpu2006/sh10.2"`
- `OMP_NUM_THREADS = "40"`

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`

### Base Portability Flags

- **C benchmarks:**  
  - `400.perlbench -DSPEC_CPU_LP64 -DSPEC_CPU_LINUX_X64`
  - `401.bzip2 -DSPEC_CPU_LP64`
  - `403.gcc -DSPEC_CPU_LP64`
  - `429.mcf -DSPEC_CPU_LP64`
  - `445.gobmk -DSPEC_CPU_LP64`
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  - `483.xalancbmk -DSPEC_CPU_LP64 -DSPEC_CPU_LINUX`

### Base Optimization Flags

- **C benchmarks:**  
  - `-xCORE-AVX2`
  - `-ipo -O3 -no-prec-div -parallel -qopt-prefetch -auto-p32`

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**Base Optimization Flags (Continued)**

C++ benchmarks:
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -auto-p32
-\(Wl,-z,\text{muldefs} \text{-L/sh10.2 -lsmartheap64}\)

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**Base Other Flags**

C benchmarks:

403.gcc: -Dalloca=_alloca

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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 questions about this result, please contact the tester.
For other inquiries, please contact webmaster@spec.org.

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