## SPEC® CINT2006 Result

**Hewlett Packard Enterprise**  
(Test Sponsor: HPE)  
ProLiant DL580 Gen9  
(2.20 GHz, Intel Xeon E7-4850 v3)

<table>
<thead>
<tr>
<th>SPECint_rate2006 = 2080</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECint_rate_base2006 = 2000</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CPU2006 license: 3</th>
<th>Test date: Feb-2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test sponsor: HPE</td>
<td>Hardware Availability: May-2015</td>
</tr>
<tr>
<td>Tested by: HPE</td>
<td>Software Availability: Dec-2015</td>
</tr>
</tbody>
</table>

### Performance Results

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Copies</th>
<th>SPECint_rate2006</th>
</tr>
</thead>
<tbody>
<tr>
<td>400.perlbench</td>
<td>112</td>
<td>1880</td>
</tr>
<tr>
<td>401.bzip2</td>
<td>112</td>
<td>982</td>
</tr>
<tr>
<td>403.gcc</td>
<td>112</td>
<td>1480</td>
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<tr>
<td>429.mcf</td>
<td>112</td>
<td>2520</td>
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<tr>
<td>445.gobmk</td>
<td>112</td>
<td>1460</td>
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<tr>
<td>456.hmmer</td>
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<td>3160</td>
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<tr>
<td>458.sjeng</td>
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<td>1570</td>
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<tr>
<td>462.libquantum</td>
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<td>2520</td>
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<tr>
<td>464.h264ref</td>
<td>112</td>
<td>2570</td>
</tr>
<tr>
<td>471.omnetpp</td>
<td>112</td>
<td>955</td>
</tr>
<tr>
<td>473.astar</td>
<td>112</td>
<td>1120</td>
</tr>
<tr>
<td>483.xalancbmk</td>
<td>112</td>
<td>2340</td>
</tr>
</tbody>
</table>

### Hardware

- **CPU Name:** Intel Xeon E7-4850 v3
- **CPU Characteristics:** Intel Turbo Boost Technology up to 2.80 GHz
- **CPU MHz:** 2200
- **FPU:** Integrated
- **CPU(s) enabled:** 56 cores, 4 chips, 14 cores/chip, 2 threads/core
- **CPU(s) orderable:** 2,3,4 chips
- **Primary Cache:** 32 KB I + 32 KB D on chip per core
- **Secondary Cache:** 256 KB I+D on chip per core
- **L3 Cache:** 35 MB I+D on chip per chip
- **Other Cache:** None
- **Memory:** 1 TB (64 x 16 GB 2Rx4 PC4-2133P-R, running at 1333 MHz)
- **Disk Subsystem:** 2 x 600 GB 15 K SAS, RAID1
- **Other Hardware:** None

### Software

- **Operating System:** SUSE Linux Enterprise Server 12 SP1 (x86_64)  
  Kernel 3.12.49-11-default
- **Compiler:** C/C++: Version 16.0.0.101 of Intel C++ Studio XE for Linux
- **Auto Parallel:** No
- **File System:** ext3
- **System State:** Run level 3 (multi-user)
- **Base Pointers:** 32-bit
- **Peak Pointers:** 32/64-bit
- **Other Software:** Microquill SmartHeap V10.2
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Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Copies</th>
<th>Seconds</th>
<th>Ratio</th>
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<tbody>
<tr>
<td>400.perlbench</td>
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<td>2340</td>
<td>331</td>
<td>2330</td>
<td>331</td>
<td>2340</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 with:
echo always > /sys/kernel/mm/transparent_hugepage/enabled
Filesystem page cache cleared with:
echo 1 > /proc/sys/vm/drop_caches
runspec command invoked through numactl i.e.:
numactl --interleave=all runspec <etc>

Platform Notes

BIOS Configuration:
HP Power Profile set to Custom
HP Power Regulator to HP Static High Performance Mode
Minimum Processor Idle Power Core State set to C6 State
Minimum Processor Idle Power Package State set to No Package State
Collaborative Power Control set to Disabled
Thermal Configuration set so Maximum Cooling
Processor Power and Utilization Monitoring set to Disabled
Memory Refresh Rate set to 1x Refresh

Sysinfo program /cpu/config/sysinfo.rev6914
Continued on next page
<table>
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**Platform Notes (Continued)**

$Rev: 6914 $ $Date:: 2014-06-25 #$ e3fbb8667b5a285932ceab81e28219e1
running on pi21 Mon Feb 22 11:23:58 2016

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) CPU E7-4850 v3 @ 2.20GHz
- 4 "physical id"s (chips)
- 112 "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 : 14
  - siblings : 28
  - physical 0: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14
  - physical 1: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14
  - physical 2: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14
  - physical 3: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14
- cache size : 35840 KB

From /proc/meminfo
- MemTotal: 1058849492 kB
- HugePages_Total: 0
- Hugepagesize: 2048 kB

From /etc/*release* /etc/*version*
- SuSE-release:
  - SUSE Linux Enterprise Server 12 (x86_64)
  - VERSION = 12
  - PATCHLEVEL = 1
  - # 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-SP1"
  - VERSION_ID="12.1"
  - PRETTY_NAME="SUSE Linux Enterprise Server 12 SP1"
  - ID="sles"
  - ANSI_COLOR="0;32"
  - CPE_NAME="cpe:/o:suse:sles:12:sp1"

uname -a:
- Linux pi21 3.12.49-11-default #1 SMP Wed Nov 11 20:52:43 UTC 2015 (8d714a0)
- x86_64 x86_64 x86_64 GNU/Linux

run-level 3 Feb 22 11:22

SPEC is set to: /cpu
- Filesystem Type Size Used Avail Use% Mounted on

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<table>
<thead>
<tr>
<th>Platform Notes (Continued)</th>
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<tbody>
<tr>
<td>/dev/sda1 ext3 550G 91G 432G 18% /</td>
</tr>
<tr>
<td>Additional information from dmidecode:</td>
</tr>
</tbody>
</table>

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 HP U17 05/06/2015
Memory:
64x HP 752369-081 16 GB 2 rank 2133 MHz, configured at 1333 MHz
32x UNKNOWN NOT AVAILABLE

(End of data from sysinfo program)
Regarding the sysinfo display about the memory installed, the correct amount of memory is 1 TB and the dmidecode description should have one line reading as:
64x HP 752369-081 16 GB 2 rank 2133 MHz, configured at 1333 MHz

<table>
<thead>
<tr>
<th>General Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environment variables set by runspec before the start of the run:</td>
</tr>
<tr>
<td>LD_LIBRARY_PATH = &quot;/cpu/libs/32:/cpu/libs/64:/cpu/sh&quot;</td>
</tr>
</tbody>
</table>

Binaries compiled on a system with 1x Intel Core i5-4670K CPU + 32GB memory using RedHat EL 7.1

<table>
<thead>
<tr>
<th>Base Compiler Invocation</th>
</tr>
</thead>
<tbody>
<tr>
<td>C benchmarks:</td>
</tr>
<tr>
<td>icc -m32 -L/opt/intel/compilers_and_libraries_2016/linux/compiler/lib/ia32_lin</td>
</tr>
<tr>
<td>C++ benchmarks:</td>
</tr>
<tr>
<td>icpc -m32 -L/opt/intel/compilers_and_libraries_2016/linux/compiler/lib/ia32_lin</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Base Portability Flags</th>
</tr>
</thead>
<tbody>
<tr>
<td>400.perlbench: -D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LINUX_IA32</td>
</tr>
<tr>
<td>401.bzip2: -D_FILE_OFFSET_BITS=64</td>
</tr>
<tr>
<td>403.gcc: -D_FILE_OFFSET_BITS=64</td>
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<td>429.mcf: -D_FILE_OFFSET_BITS=64</td>
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<td>445.gobmk: -D_FILE_OFFSET_BITS=64</td>
</tr>
<tr>
<td>456.hmmer: -D_FILE_OFFSET_BITS=64</td>
</tr>
<tr>
<td>458.sjeng: -D_FILE_OFFSET_BITS=64</td>
</tr>
<tr>
<td>462.libquantum: -D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LINUX</td>
</tr>
<tr>
<td>464.h264ref: -D_FILE_OFFSET_BITS=64</td>
</tr>
<tr>
<td>471.omnetpp: -D_FILE_OFFSET_BITS=64</td>
</tr>
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Base Portability Flags

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SPECint_rate2006 = 2080
SPECint_rate_base2006 = 2000

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

Peak Portability Flags (Continued)

445.gobmk: -D_FILE_OFFSET_BITS=64
456.hmmer: -D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LP64
458.sjeng: -D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LP64
462.libquantum: -D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LINUX
464.h264ref: -D_FILE_OFFSET_BITS=64
471.omnetpp: -D_FILE_OFFSET_BITS=64
473.astar: -D_FILE_OFFSET_BITS=64
483.xalancbmk: -D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LINUX

Peak Optimization Flags

C benchmarks:

400.perlbmk: -xCORE-AVX2 -prof-gen:threadsafe(pass 1) 
              -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2) 
              -par-num-threads=1(pass 1) -prof-use(pass 2) -auto-ilp32

401.bzip2: -xCORE-AVX2(pass 2) -prof-gen:threadsafe(pass 1) 
             -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2) 
             -par-num-threads=1(pass 1) -prof-use(pass 2) -opt-prefetch 
             -auto-ilp32 -ansi-alias

403.gcc: -xCORE-AVX2 -ipo -O3 -no-prec-div

429.mcf: basepeak = yes

445.gobmk: -xCORE-AVX2(pass 2) -prof-gen:threadsafe(pass 1) 
            -prof-use(pass 2) -par-num-threads=1(pass 1) -ansi-alias 
            -opt-mem-layout-trans=3

456.hmmer: -xCORE-AVX2 -ipo -O3 -no-prec-div -unroll2 -auto-ilp32

458.sjeng: -xCORE-AVX2(pass 2) -prof-gen:threadsafe(pass 1) 
           -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2) 
           -par-num-threads=1(pass 1) -prof-use(pass 2) -unroll4 
           -auto-ilp32

462.libquantum: basepeak = yes

464.h264ref: -xCORE-AVX2(pass 2) -prof-gen:threadsafe(pass 1) 
             -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2) 
             -par-num-threads=1(pass 1) -prof-use(pass 2) -unroll2 
             -ansi-alias

C++ benchmarks:

471.omnetpp: -xCORE-AVX2(pass 2) -prof-gen:threadsafe(pass 1) 
              -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2) 
              -par-num-threads=1(pass 1) -prof-use(pass 2) -ansi-alias

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Peak Optimization Flags (Continued)

471.omnetpp (continued):
   -opt-ra-region-strategy=block -Wl,-z,muldefs
   -L/sh -lsmartheap

473.astar: basepeak = yes
483.xalancbmk: basepeak = yes

Peak 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-ic16.0-official-linux64.html
http://www.spec.org/cpu2006/flags/HP-Platform-Flags-Intel-V1.2-HSW-revE.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2006/flags/Intel-ic16.0-official-linux64.xml
http://www.spec.org/cpu2006/flags/HP-Platform-Flags-Intel-V1.2-HSW-revE.xml

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