## SPEC® CINT2006 Result

**Hewlett-Packard Company**

ProLiant DL580 Gen9
(2.50 GHz, Intel Xeon E7-8890 v3)

<table>
<thead>
<tr>
<th>SPECint®2006</th>
<th>63.4</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECint_base2006</td>
<td>61.5</td>
</tr>
</tbody>
</table>

**CPU2006 license:** 3  
**Test date:** Apr-2015  
**Test sponsor:** Hewlett-Packard Company  
**Hardware Availability:** May-2015  
**Tested by:** Hewlett-Packard Company  
**Software Availability:** Oct-2014

**SPECint2006 = 63.4**  
**SPECint_base2006 = 61.5**

### Hardware

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU Name</td>
<td>Intel Xeon E7-8890 v3</td>
</tr>
<tr>
<td>CPU Characteristics</td>
<td>Intel Turbo Boost Technology up to 3.30 GHz</td>
</tr>
<tr>
<td>CPU MHz</td>
<td>2500</td>
</tr>
<tr>
<td>FPU</td>
<td>Integrated</td>
</tr>
<tr>
<td>CPU(s) enabled</td>
<td>72 cores, 4 chips, 18 cores/chip</td>
</tr>
<tr>
<td>CPU(s) orderable</td>
<td>2.4 chip</td>
</tr>
<tr>
<td>Primary Cache</td>
<td>32 KB 1 + 32 KB D on chip per core</td>
</tr>
<tr>
<td>Secondary Cache</td>
<td>256 KB 1+D on chip per core</td>
</tr>
<tr>
<td>L3 Cache</td>
<td>45 MB 1+D on chip per chip</td>
</tr>
<tr>
<td>Other Cache</td>
<td>None</td>
</tr>
<tr>
<td>Memory</td>
<td>512 GB (32 x 16 GB 2Rx4 PC4-2133P-R, running at 1600 MHz)</td>
</tr>
<tr>
<td>Disk Subsystem</td>
<td>1 x 400 GB SAS SSD, RAID 0</td>
</tr>
<tr>
<td>Other Hardware</td>
<td>None</td>
</tr>
</tbody>
</table>

### Software

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating System</td>
<td>SUSE Linux Enterprise Server 12 (x86_64)</td>
</tr>
<tr>
<td>Compiler</td>
<td>C/C++: Version 15.0.0.0.090 of Intel C++ Studio XE for Linux</td>
</tr>
<tr>
<td>Auto Parallel</td>
<td>Yes</td>
</tr>
<tr>
<td>File System</td>
<td>xfs</td>
</tr>
<tr>
<td>System State</td>
<td>Run level 3 (multi-user)</td>
</tr>
<tr>
<td>Base Pointers</td>
<td>32/64-bit</td>
</tr>
<tr>
<td>Peak Pointers</td>
<td>32/64-bit</td>
</tr>
<tr>
<td>Other Software</td>
<td>Microquill SmartHeap V10.0</td>
</tr>
</tbody>
</table>

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Standard Performance Evaluation Corporation  
info@spec.org  
http://www.spec.org/
Hewlett-Packard Company

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SPECint2006 = 63.4
SPECint_base2006 = 61.5

Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Seconds</th>
<th>Ratio</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>258</td>
<td>37.8</td>
<td>257</td>
<td>38.0</td>
<td>258</td>
<td>37.9</td>
<td>225</td>
<td>43.4</td>
</tr>
<tr>
<td>401.bzip2</td>
<td>421</td>
<td>22.9</td>
<td>422</td>
<td>22.9</td>
<td>422</td>
<td>22.9</td>
<td>418</td>
<td>23.1</td>
</tr>
<tr>
<td>403.gcc</td>
<td>248</td>
<td>32.5</td>
<td>247</td>
<td>32.6</td>
<td>248</td>
<td>32.5</td>
<td>242</td>
<td>33.3</td>
</tr>
<tr>
<td>429.mcf</td>
<td>169</td>
<td>53.9</td>
<td>171</td>
<td>53.3</td>
<td>175</td>
<td>52.1</td>
<td>169</td>
<td>53.9</td>
</tr>
<tr>
<td>445.gobmk</td>
<td>384</td>
<td>27.3</td>
<td>384</td>
<td>27.3</td>
<td>385</td>
<td>27.2</td>
<td>384</td>
<td>27.3</td>
</tr>
<tr>
<td>456.hmmer</td>
<td>143</td>
<td>65.2</td>
<td>143</td>
<td>65.1</td>
<td>143</td>
<td>65.2</td>
<td>143</td>
<td>65.2</td>
</tr>
<tr>
<td>458.sjeng</td>
<td>378</td>
<td>32.0</td>
<td>378</td>
<td>32.0</td>
<td>378</td>
<td>32.0</td>
<td>376</td>
<td>32.2</td>
</tr>
<tr>
<td>462.libquantum</td>
<td>2.25</td>
<td>9210</td>
<td>2.23</td>
<td>9290</td>
<td>2.20</td>
<td>9430</td>
<td>2.25</td>
<td>9210</td>
</tr>
<tr>
<td>464.h264ref</td>
<td>508</td>
<td>43.7</td>
<td>506</td>
<td>43.8</td>
<td>506</td>
<td>43.8</td>
<td>506</td>
<td>43.8</td>
</tr>
<tr>
<td>471.omnetpp</td>
<td>144</td>
<td>43.3</td>
<td>144</td>
<td>43.3</td>
<td>146</td>
<td>42.7</td>
<td>121</td>
<td>51.5</td>
</tr>
<tr>
<td>473.astar</td>
<td>223</td>
<td>31.5</td>
<td>224</td>
<td>31.4</td>
<td>223</td>
<td>31.5</td>
<td>221</td>
<td>31.7</td>
</tr>
<tr>
<td>483.xalancbmk</td>
<td>112</td>
<td>61.4</td>
<td>112</td>
<td>61.5</td>
<td>112</td>
<td>61.7</td>
<td>112</td>
<td>61.5</td>
</tr>
</tbody>
</table>

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

Submit Notes

The config file option 'submit' was used.

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

Platform Notes

BIOS Configuration
Intel Hypthreading Options set to Disabled
Power Profile set to Custom
Power Regulator set to Static High Performance Mode
Minimum Processor Idle Power Core C-State set to C6 State
Minimum Processor Idle Power Package C-State set to Package C6 (retention) State
Energy/Performance Bias set to Maximum Performance
Collaborative Power Control set to Enabled
Thermal Configuration set to Maximum Cooling
Processor Power and Utilization Monitoring set to Disabled
Memory Refresh Rate set to 1x Refresh

Sysinfo program /cpu2006/config/sysinfo.rev6914
$Rev: 6914 $ $Date:: 2014-06-25 #$ e3fbb8667b5a285932ceab81e28219e1
running on linux-t8cw Sun Apr 19 23:19:02 2015

This section contains SUT (System Under Test) info as seen by
Continued on next page
SPEC CINT2006 Result

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Platform Notes (Continued)

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 E7-8890 v3 @ 2.50GHz
    4 "physical id"s (chips)
    72 "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 : 18
       siblings : 18
       physical 0: cores 0 2 3 4 8 9 10 11 16 17 18 19 20 24 25 26 27
       physical 1: cores 0 2 3 4 8 9 10 11 16 17 18 19 20 24 25 26 27
       physical 2: cores 0 2 3 4 8 9 10 11 16 17 18 19 20 24 25 26 27
       physical 3: cores 0 2 3 4 8 9 10 11 16 17 18 19 20 24 25 26 27
    cache size : 46080 KB

From /proc/meminfo
    MemTotal:       529317552 kB
    HugePages_Total:       0
    Hugepagesize:       2048 kB

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

    uname -a:
    Linux linux-t8cw 3.12.28-4-default #1 SMP Thu Sep 25 17:02:34 UTC 2014
    (9879bd4) x86_64 x86_64 x86_64 GNU/Linux
    run-level 3 Apr 19 17:49

    SPEC is set to: /cpu2006
    Filesystem    Type  Size  Used Avail Use% Mounted on
    /dev/sda3  xfs  371G  8.4G  362G  3% /
    Additional information from dmidecode:

    Warning: Use caution when you interpret this section. The 'dmidecode' program
Continued on next page
## Platform Notes (Continued)

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 03/13/2015
Memory:
64x UNKNOWN NOT AVAILABLE
32x UNKNOWN NOT AVAILABLE 16 GB 2 rank 2133 MHz, configured at 1600 MHz

(End of data from sysinfo program)
Regarding the sysinfo display about the memory installed, the correct amount of
memory is 512 GB and the dmidecode description should have one line reading as:
32x UNKNOWN NOT AVAILABLE 16 GB 2 rank 2133 MHz, configured at 1600 MHz

## General Notes

Environment variables set by runspec before the start of the run:
KMP_AFFINITY = "granularity=fine,compact"
LD_LIBRARY_PATH = "/cpu2006/libs/32:/cpu2006/libs/64:/cpu2006/sh"
OMP_NUM_THREADS = "72"

Binaries compiled on a system with 1x Core i5-4670K CPU + 16GB
memory using RedHat EL 7.0

## Base Compiler Invocation

C benchmarks:
```bash
icc -m64
```

C++ benchmarks:
```bash
icpc -m64
```

## Base Portability Flags

400.perlbench: -DSPEC_CPU_LP64 -DSPEC_CPU_LINUX_X64
401.bzip2: -DSPEC_CPU_LP64
403.gcc: -DSPEC_CPU_LP64
429.mcf: -DSPEC_CPU_LP64
443.gobmk: -DSPEC_CPU_LP64
456.hmmer: -DSPEC_CPU_LP64
458.sjeng: -DSPEC_CPU_LP64
462.libquantum: -DSPEC_CPU_LP64 -DSPEC_CPU_LINUX
464.h264ref: -DSPEC_CPU_LP64
471.omnetpp: -DSPEC_CPU_LP64
473.astar: -DSPEC_CPU_LP64
483.xalancbmk: -DSPEC_CPU_LP64 -DSPEC_CPU_LINUX
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**Base Optimization Flags**

C benchmarks:
-xCORE-AVX2 -ipo -O3 -no-prec-div -parallel -opt-prefetch -auto-p32

C++ benchmarks:
-xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch -auto-p32
-Wl,-z,muldefs -L/sh -lsmartheap64

---

**Base Other Flags**

C benchmarks:
403.gcc: -Dalloca=_alloca

---

**Peak Compiler Invocation**

C benchmarks (except as noted below):
icc -m64
400.perlbench: icc -m32 -L/opt/intel/composer_xe_2015/lib/ia32

C++ benchmarks (except as noted below):
icpc -m64
471.omnetpp: icpc -m32 -L/opt/intel/composer_xe_2015/lib/ia32

---

**Peak Portability Flags**

400.perlbench: -DSPEC_CPU_LINUX_IA32
401.bzip2: -DSPEC_CPU_LP64
403.gcc: -DSPEC_CPU_LP64
429.mcf: -DSPEC_CPU_LP64
445.gobmk: -DSPEC_CPU_LP64
456.hmmer: -DSPEC_CPU_LP64
458.sjeng: -DSPEC_CPU_LP64
462.libquantum: -DSPEC_CPU_LP64 -DSPEC_CPU_LINUX
464.h264ref: -DSPEC_CPU_LP64
473.astar: -DSPEC_CPU_LP64
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Peak Optimization Flags

C benchmarks:

400.perlbench: -xCORE-AVX2(pass 2) -prof-gen(pass 1) -ipo(pass 2)
-o3(pass 2) -no-prec-div(pass 2) -prof-use(pass 2)
-opt-prefetch -ansi-alias

401.bzip2: -xCORE-AVX2(pass 2) -prof-gen(pass 1) -ipo(pass 2)
-o3(pass 2) -no-prec-div -prof-use(pass 2) -auto-ilp32
-opt-prefetch -ansi-alias

403.gcc: -xCORE-AVX2 -ipo -o3 -no-prec-div -inline-calloc
-opt-malloc-options=3 -auto-ilp32

429.mcf: basepeak = yes

445.gobmk: basepeak = yes

456.hmmer: basepeak = yes

458.sjeng: -xCORE-AVX2(pass 2) -prof-gen(pass 1) -ipo(pass 2)
-o3(pass 2) -no-prec-div(pass 2) -prof-use(pass 2)

462.libquantum: basepeak = yes

464.h264ref: basepeak = yes

C++ benchmarks:

471.omnetpp: -xCORE-AVX2(pass 2) -prof-gen(pass 1) -ipo(pass 2)
-o3(pass 2) -no-prec-div(pass 2) -prof-use(pass 2)
-opt-ra-region-strategy=block -ansi-alias
-Wl,-z,muldefs -L/sh -lsmartheap

473.astar: -xCORE-AVX2 -ipo -o3 -no-prec-div -opt-prefetch
-auto-p32 -Wl,-z,muldefs -L/sh -lsmartheap64

483.xalancbmk: basepeak = yes

Peak 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/Intel-ic15.0-official-linux64.html](http://www.spec.org/cpu2006/flags/Intel-ic15.0-official-linux64.html)

You can also download the XML flags sources by saving the following links:

- [http://www.spec.org/cpu2006/flags/Intel-ic15.0-official-linux64.xml](http://www.spec.org/cpu2006/flags/Intel-ic15.0-official-linux64.xml)
- [http://www.spec.org/cpu2006/flags/HP-Platform-Flags-Intel-V1.2-HSW-revE.xml](http://www.spec.org/cpu2006/flags/HP-Platform-Flags-Intel-V1.2-HSW-revE.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 5 May 2015.