Hewlett-Packard Company
ProLiant DL580 Gen9
(2.30 GHz, Intel Xeon E7-8880 v3)  

**SPECint®2006** = 60.0  
**SPECint_base2006** = 58.2

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<thead>
<tr>
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<th>May-2015</th>
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<tr>
<td>Test sponsor:</td>
<td>Hewlett-Packard Company</td>
</tr>
<tr>
<td>Hardware Availability:</td>
<td>May-2015</td>
</tr>
<tr>
<td>Software Availability:</td>
<td>Mar-2015</td>
</tr>
</tbody>
</table>

### Hardware

<table>
<thead>
<tr>
<th><strong>CPU Name</strong>: Intel Xeon E7-8880 v3</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CPU Characteristics</strong>: Intel Turbo Boost Technology up to 3.10 GHz</td>
</tr>
<tr>
<td><strong>CPU MHz</strong>: 2300</td>
</tr>
<tr>
<td><strong>FPU</strong>: Integrated</td>
</tr>
<tr>
<td><strong>CPU(s) enabled</strong>: 72 cores, 4 chips, 18 cores/chip</td>
</tr>
<tr>
<td><strong>CPU(s) orderable</strong>: 2.4 chip</td>
</tr>
<tr>
<td><strong>Primary Cache</strong>: 32 KB I + 32 KB D on chip per core</td>
</tr>
<tr>
<td><strong>Secondary Cache</strong>: 256 KB I+D on chip per core</td>
</tr>
<tr>
<td><strong>L3 Cache</strong>: 45 MB I+D on chip per chip</td>
</tr>
<tr>
<td><strong>Other Cache</strong>: None</td>
</tr>
<tr>
<td><strong>Memory</strong>: 512 GB (32 x 16 GB 2Rx4 PC4-2133P-R, running at 1600 MHz)</td>
</tr>
<tr>
<td><strong>Disk Subsystem</strong>: 1 x 400 GB SAS SSD, RAID 0</td>
</tr>
<tr>
<td><strong>Other Hardware</strong>: None</td>
</tr>
</tbody>
</table>

### Software

<table>
<thead>
<tr>
<th><strong>Operating System</strong>: SUSE Linux Enterprise Server 12 (x86_64)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Kernel</strong>: 3.12.28-4-default</td>
</tr>
<tr>
<td><strong>Compiler</strong>: C/C++: Version 15.0.0.090 of Intel C++ Studio XE for Linux</td>
</tr>
<tr>
<td><strong>Auto Parallel</strong>: Yes</td>
</tr>
<tr>
<td><strong>File System</strong>: xfs</td>
</tr>
<tr>
<td><strong>System State</strong>: Run level 3 (multi-user)</td>
</tr>
<tr>
<td><strong>Base Pointers</strong>: 32/64-bit</td>
</tr>
<tr>
<td><strong>Peak Pointers</strong>: 32/64-bit</td>
</tr>
<tr>
<td><strong>Other Software</strong>: Microquill SmartHeap V10.0</td>
</tr>
</tbody>
</table>
Hewlett-Packard Company
ProLiant DL580 Gen9
(2.30 GHz, Intel Xeon E7-8880 v3)

SPECint2006 = 60.0
SPECint_base2006 = 58.2

CPU2006 license: 3
Test sponsor: Hewlett-Packard Company
Tested by: Hewlett-Packard Company

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>
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<th>Ratio</th>
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</thead>
<tbody>
<tr>
<td>400.perlbench</td>
<td>274</td>
<td>35.6</td>
<td>273</td>
<td>35.8</td>
<td>273</td>
<td>35.8</td>
<td>238</td>
<td>41.1</td>
<td>238</td>
<td>41.1</td>
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<tr>
<td>403.gcc</td>
<td>256</td>
<td>31.4</td>
<td>257</td>
<td>31.3</td>
<td>256</td>
<td>31.4</td>
<td>252</td>
<td>31.9</td>
<td>251</td>
<td>32.1</td>
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<tr>
<td>429.mcf</td>
<td>177</td>
<td>51.6</td>
<td>180</td>
<td>50.6</td>
<td>179</td>
<td>51.0</td>
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<td>50.8</td>
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<td>51.0</td>
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<tr>
<td>445.gobmk</td>
<td>405</td>
<td>25.9</td>
<td>406</td>
<td>25.8</td>
<td>405</td>
<td>25.9</td>
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<tr>
<td>456.hmmer</td>
<td>153</td>
<td>61.1</td>
<td>153</td>
<td>61.1</td>
<td>152</td>
<td>61.3</td>
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<td>61.1</td>
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<td>61.1</td>
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<tr>
<td>458.sjeng</td>
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<td>30.2</td>
<td>397</td>
<td>30.5</td>
<td>398</td>
<td>30.4</td>
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<tr>
<td>462.libquantum</td>
<td>2.44</td>
<td>8500</td>
<td>2.47</td>
<td>8390</td>
<td>2.43</td>
<td>8520</td>
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<td>8500</td>
<td>2.47</td>
<td>8390</td>
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<tr>
<td>464.h264ref</td>
<td>518</td>
<td>42.7</td>
<td>520</td>
<td>42.6</td>
<td>519</td>
<td>42.7</td>
<td>518</td>
<td>42.7</td>
<td>520</td>
<td>42.6</td>
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<tr>
<td>471.omnetpp</td>
<td>157</td>
<td>39.7</td>
<td>154</td>
<td>40.6</td>
<td>158</td>
<td>39.5</td>
<td>123</td>
<td>50.8</td>
<td>130</td>
<td>47.9</td>
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<tr>
<td>473.astar</td>
<td>236</td>
<td>29.7</td>
<td>236</td>
<td>29.7</td>
<td>236</td>
<td>29.7</td>
<td>234</td>
<td>30.0</td>
<td>237</td>
<td>29.7</td>
</tr>
<tr>
<td>483.xalancbmk</td>
<td>118</td>
<td>58.7</td>
<td>118</td>
<td>58.4</td>
<td>117</td>
<td>59.2</td>
<td>118</td>
<td>58.7</td>
<td>118</td>
<td>58.4</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 Hyperthreading 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 Disabled
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 d1580gen9-4-sles12 Fri May  8 18:36:31 2015

This section contains SUT (System Under Test) info as seen by
Continued on next page
Hewlett-Packard Company
ProLiant DL580 Gen9
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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 E7-8880 v3 @ 2.30GHz
  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
cautions.)
  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:       529163928 kB
HugePages_Total:       0
Hugepagesize:       2048 kB

/usr/bin/lsb_release -d
SUSE Linux Enterprise Server 12

From /etc/*release* /etc/*version*
SuSE-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 dl580gen9-4-sles12 3.12.28-4-default #1 SMP Thu Sep 25 17:02:34 UTC
2014 (9879b4d) x86_64 x86_64 x86_64 GNU/Linux

run-level 3 May 8 18:35

SPEC is set to: /cpu2006

Filesystem     Type  Size  Used Avail Use% Mounted on
/dev/sda3      xfs  371G  260G  111G  71% /
SPEC CINT2006 Result

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Platform Notes (Continued)

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 HP U17 03/13/2015
Memory:
32x HP 752369-081 16 GB 2 rank 2133 MHz, configured at 1600 MHz
64x UNKNOWN NOT AVAILABLE

(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 HP 752369-081 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,scatter"
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:
  icc  -m64

C++ benchmarks:
  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
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

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Hewlett-Packard Company

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Base Portability Flags (Continued)

471.omnetpp: -DSPEC_CPU_LP64
473.astar: -DSPEC_CPU_LP64
483.xalancbmk: -DSPEC_CPU_LP64 -DSPEC_CPU_LINUX

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

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## SPEC CINT2006 Result

### Hewlett-Packard Company

**ProLiant DL580 Gen9**  
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### Peak Portability Flags (Continued)

- 464.h264ref: `-DSPEC_CPU_LP64`
- 473.astar: `-DSPEC_CPU_LP64`
- 483.xalancbmk: `-DSPEC_CPU_LP64 -DSPEC_CPU_LINUX`

### 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
  -opt-prefetch -auto-p32`
- **429.mcf:** `-xCORE-AVX2 -ipo -O3 -no-prec-div -parallel
  -opt-prefetch -auto-p32`
- **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)
  -unroll4`
- **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`
Hewlett-Packard Company

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Test date: May-2015
Hardware Availability: May-2015
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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-ic15.0-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-ic15.0-official-linux64.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.

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