Hewlett Packard Enterprise
(Test Sponsor: HPE)
ProLiant ML350 Gen9
(1.80 GHz, Intel Xeon E5-2630L v4)

SPECint®2006 = 58.8
SPECint_base2006 = 56.0

<table>
<thead>
<tr>
<th>Software</th>
<th>CPU Name: Intel Xeon E5-2630L v4</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU Characteristics: Intel Turbo Boost Technology up to 2.90 GHz</td>
<td></td>
</tr>
<tr>
<td>CPU MHz: 1800</td>
<td></td>
</tr>
<tr>
<td>FPU: Integrated</td>
<td></td>
</tr>
<tr>
<td>CPU(s) enabled: 20 cores, 2 chips, 10 cores/chip</td>
<td></td>
</tr>
<tr>
<td>CPU(s) orderable: 1, 2 chips</td>
<td></td>
</tr>
<tr>
<td>Primary Cache: 32 KB I + 32 KB D on chip per core</td>
<td></td>
</tr>
<tr>
<td>Secondary Cache: 256 KB I+D on chip per core</td>
<td></td>
</tr>
<tr>
<td>L3 Cache: 25 MB I+D on chip per chip</td>
<td></td>
</tr>
<tr>
<td>Other Cache: None</td>
<td></td>
</tr>
<tr>
<td>Memory: 512 GB (16 x 32 GB 2Rx4 PC4-2400T-R, running at 2133 MHz)</td>
<td></td>
</tr>
<tr>
<td>Disk Subsystem: 1 x 800 GB SAS SSD, RAID 0</td>
<td></td>
</tr>
<tr>
<td>Other Hardware: None</td>
<td></td>
</tr>
<tr>
<td>Operating System: SUSE Linux Enterprise Server 12 (x86_64) SP1</td>
<td></td>
</tr>
<tr>
<td>Compiler: CIC++ Version 16.0.0.101 of Intel C++ Studio XE for Linux</td>
<td></td>
</tr>
<tr>
<td>Auto Parallel: Yes</td>
<td></td>
</tr>
<tr>
<td>File System: xfs</td>
<td></td>
</tr>
<tr>
<td>System State: Run level 3 (multi-user)</td>
<td></td>
</tr>
<tr>
<td>Base Pointers: 32/64-bit</td>
<td></td>
</tr>
<tr>
<td>Peak Pointers: 32/64-bit</td>
<td></td>
</tr>
<tr>
<td>Other Software: Microquill SmartHeap V10.2</td>
<td></td>
</tr>
</tbody>
</table>
# SPEC CINT2006 Result

Hewlett Packard Enterprise  
(Test Sponsor: HPE)  
ProLiant ML350 Gen9  
(1.80 GHz, Intel Xeon E5-2630L v4)  

<table>
<thead>
<tr>
<th>SPECint2006</th>
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</tr>
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<tbody>
<tr>
<td>SPECint_base2006</td>
<td>56.0</td>
</tr>
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</table>

**CPU2006 license:** 3  
**Test sponsor:** HPE  
**Tested by:** HPE  
**Test date:** May-2016  
**Hardware Availability:** Mar-2016  
**Software Availability:** Dec-2015

## Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Base</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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</thead>
<tbody>
<tr>
<td>400.perlbench</td>
<td>282</td>
<td>34.6</td>
<td>283</td>
<td>34.5</td>
<td>282</td>
<td>34.6</td>
<td><strong>259</strong></td>
<td><strong>37.7</strong></td>
<td>260</td>
<td>37.5</td>
<td>259</td>
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<tr>
<td>401.bzip2</td>
<td>452</td>
<td>21.4</td>
<td>449</td>
<td>21.5</td>
<td><strong>449</strong></td>
<td><strong>21.5</strong></td>
<td><strong>442</strong></td>
<td><strong>21.8</strong></td>
<td>443</td>
<td>21.8</td>
<td>442</td>
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<tr>
<td>403.gcc</td>
<td>242</td>
<td>33.3</td>
<td><strong>242</strong></td>
<td><strong>33.3</strong></td>
<td>242</td>
<td>33.3</td>
<td>242</td>
<td>33.3</td>
<td><strong>242</strong></td>
<td><strong>33.3</strong></td>
<td>242</td>
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<tr>
<td>429.mcf</td>
<td>152</td>
<td>59.8</td>
<td>154</td>
<td>59.3</td>
<td><strong>153</strong></td>
<td><strong>59.7</strong></td>
<td>152</td>
<td>59.8</td>
<td>154</td>
<td>59.3</td>
<td><strong>153</strong></td>
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<tr>
<td>445.gobmk</td>
<td>415</td>
<td>25.3</td>
<td>416</td>
<td>25.2</td>
<td><strong>415</strong></td>
<td><strong>25.3</strong></td>
<td>415</td>
<td>25.3</td>
<td>416</td>
<td>25.2</td>
<td><strong>415</strong></td>
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<tr>
<td>456.hmmer</td>
<td>131</td>
<td>71.5</td>
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<td>71.6</td>
<td><strong>130</strong></td>
<td><strong>71.5</strong></td>
<td>131</td>
<td>71.5</td>
<td>130</td>
<td>71.6</td>
<td><strong>130</strong></td>
</tr>
<tr>
<td>458.sjeng</td>
<td>418</td>
<td>29.0</td>
<td><strong>417</strong></td>
<td><strong>29.0</strong></td>
<td>417</td>
<td>29.0</td>
<td><strong>412</strong></td>
<td><strong>29.4</strong></td>
<td>412</td>
<td>29.4</td>
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<tr>
<td>462.libquantum</td>
<td><strong>5.00</strong></td>
<td><strong>4140</strong></td>
<td>4.70</td>
<td>4410</td>
<td>5.02</td>
<td>4130</td>
<td><strong>5.00</strong></td>
<td><strong>4140</strong></td>
<td>4.70</td>
<td>4410</td>
<td>5.02</td>
</tr>
<tr>
<td>464.h264ref</td>
<td>469</td>
<td>47.1</td>
<td><strong>470</strong></td>
<td><strong>47.1</strong></td>
<td>471</td>
<td>47.0</td>
<td>469</td>
<td>47.1</td>
<td><strong>470</strong></td>
<td><strong>47.1</strong></td>
<td>471</td>
</tr>
<tr>
<td>471.omnetpp</td>
<td>202</td>
<td>31.0</td>
<td><strong>203</strong></td>
<td><strong>30.8</strong></td>
<td>205</td>
<td>30.5</td>
<td>140</td>
<td>44.7</td>
<td><strong>140</strong></td>
<td><strong>44.6</strong></td>
<td>140</td>
</tr>
<tr>
<td>473.astar</td>
<td>226</td>
<td>31.1</td>
<td>224</td>
<td>31.4</td>
<td><strong>224</strong></td>
<td><strong>31.4</strong></td>
<td>224</td>
<td>31.3</td>
<td><strong>224</strong></td>
<td><strong>31.4</strong></td>
<td>224</td>
</tr>
<tr>
<td>483.xalancbm</td>
<td>108</td>
<td>64.2</td>
<td>106</td>
<td>65.1</td>
<td><strong>106</strong></td>
<td><strong>65.0</strong></td>
<td><strong>96.5</strong></td>
<td><strong>71.5</strong></td>
<td>96.4</td>
<td>71.6</td>
<td>96.6</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/transparenthugepage/never

## Platform Notes

BIOS Configuration:  
Intel Hyperthreading Option 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 C1E State  
Minimum Processor Idle Power Package C-State set to No Package State  
Collaborative Power Control set to Disabled  
QPI Snoop Configuration set to Home Snoop  
Thermal Configuration set to Maximum Cooling  
Processor Power and Utilization Monitoring set to Disabled  
Memory Double Refresh Rate set to 1x Refresh  
Energy Performance Bias set to Maximum Performance  
Sysinfo program /home/specuser/cpu2006/config/sysinfo.rev6914  
$Rev: 6914 $ $Date:: 2014-06-25 $$ e3fbb8667b5a285932ceab81e28219e1  
running on linux-7m5.1 Sat May 28 04:26:27 2016

This section contains SUT (System Under Test) info as seen by

Continued on next page
Hewlett Packard Enterprise  
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ProLiant ML350 Gen9  
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SPECint2006 = 58.8  
SPECint_base2006 = 56.0

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

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 E5-2630L v4 @ 1.80GHz  
- 2 "physical id"s (chips)  
- 20 "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: 10  
  - siblings: 10  
  - physical 0: cores 0 2 3 4 8 9 10 11 12  
  - physical 1: cores 0 2 3 4 8 9 10 11 12  
  - cache size: 25600 KB

From /proc/meminfo

- MemTotal: 529095048 kB  
- HugePages_Total: 0  
- Hugepagesize: 2048 kB

/usr/bin/lsb_release -d  
SUSE Linux Enterprise Server 12 SP1

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 linux-7m51 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 May 28 04:16

SPEC is set to: /home/specuser/cpu2006  
Filesystem Type Size Used Avail Use% Mounted on  
/dev/sda4 xfs 703G 236G 468G 34% /home

Additional information from dmidecode:

Continued on next page
SPEC CINT2006 Result

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SPECint_base2006 = 56.0

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

Platform Notes (Continued)

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 P92 04/12/2016  
Memory:  
8x UNKNOWN NOT AVAILABLE  
16x UNKNOWN NOT AVAILABLE 32 GB 2 rank 2400 MHz, configured at 2133 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:  
16x UNKNOWN NOT AVAILABLE 32 GB 2 rank 2400 MHz, configured at 2133 MHz

General Notes

Environment variables set by runspec before the start of the run:

KMP_AFFINITY = "granularity=fine,scatter"
LD_LIBRARY_PATH = "/home/specuser/cpu2006/libs/32:/home/specuser/cpu2006/libs/64:/home/specuser/cpu2006/sh"
OMP_NUM_THREADS = "20"

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

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
471.omnetpp:  -DSPEC_CPU_LP64
473.astar:  -DSPEC_CPU_LP64

Continued on next page
SPEC CINT2006 Result

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(Test Sponsor: HPE)
ProLiant ML350 Gen9
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SPECint_base2006 = 56.0

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

Test date: May-2016
Hardware Availability: Mar-2016
Software Availability: Dec-2015

Base Portability Flags (Continued)

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/compilers_and_libraries_2016/linux/compiler/lib/ia32_lin

C++ benchmarks (except as noted below):
icpc -m32 -L/opt/intel/compilers_and_libraries_2016/linux/compiler/lib/ia32_lin

473.astar: icpc -m64

Peak Portability Flags

400.perlbench: -D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LINUX_IA32
401.bzip2: -DSPEC_CPU_LP64
403.gcc: -DSPEC_CPU_LP64
404.mcf: -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
471.omnetpp: -D_FILE_OFFSET_BITS=64

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Hewlett Packard Enterprise
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Software Availability: Dec-2015

Peak Portability Flags (Continued)

473.astar: -DSPEC_CPU_LP64
483.xalancbmk: -D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LINUX

Peak Optimization Flags

C benchmarks:

400.perlbench: -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
    -ansi-alias

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

403.gcc: basepeak = yes
429.mcf: basepeak = yes
445.gobmk: basepeak = yes
456.hmmer: basepeak = yes
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

462.libquantum: basepeak = yes
464.h264ref: basepeak = yes

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)
    -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: -xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch
    -ansi-alias -Wl,-z,muldefs -L/sh -lsmartheap
Hewlett Packard Enterprise  
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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-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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For questions about this result, please contact the tester.  
For other inquiries, please contact webmaster@spec.org.

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