Hewlett Packard Enterprise
(Test Sponsor: HPE)
ProLiant BL460c Gen9
(2.00 GHz, Intel Xeon E5-2660 v4)

SPECint®2006 = 65.5
SPECint_base2006 = 63.0

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

Hardware
CPU Name: Intel Xeon E5-2660 v4
CPU Characteristics: Intel Turbo Boost Technology up to 3.20 GHz
CPU MHz: 2000
FPU: Integrated
CPU(s) enabled: 28 cores, 2 chips, 14 cores/chip
CPU(s) orderable: 1.2 chip
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: 256 GB (8 x 32 GB 2Rx4 PC4-2400T-R)
Disk Subsystem: 2 x 500 GB SAS HDD 10 K, RAID 1
Other Hardware: None

Software
Operating System: SuSE Linux Enterprise 12 (x86_64) SP1
Compiler: C/C++: Version 16.0.0.101 of Intel C++ Studio XE for Linux
Auto Parallel: Yes
File System: xfs
System State: Run level 5 (multi-user, w/GUI)
Base Pointers: 32/64-bit
Peak Pointers: 32/64-bit
Other Software: Microquill SmartHeap V10.2

400.perlbench
401.bzip2
403.gcc
429.mcf
445.gobmk
456.hmmer
458.sjeng
462.libquantum
464.h264ref
471.omnetpp
473.astar
483.xalancbmk

SPEClnt_base2006 = 63.0

SPECint2006 = 65.5
**SPEC CINT2006 Result**

(Hewlett Packard Enterprise)
ProLiant BL460c Gen9
(2.00 GHz, Intel Xeon E5-2660 v4)

**SPECint2006 = 65.5**
**SPECint_base2006 = 63.0**

Test Sponsor: HPE
Hewlett Packard Enterprise

(2.00 GHz, Intel Xeon E5-2660 v4)
ProLiant BL460c Gen9

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>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>400.perlbench</td>
<td>261</td>
<td>37.4</td>
<td>261</td>
<td>37.5</td>
<td>262</td>
<td>37.3</td>
<td>239</td>
<td>40.8</td>
<td>239</td>
<td>40.8</td>
<td>240</td>
<td>40.7</td>
</tr>
<tr>
<td>401.bzip2</td>
<td>419</td>
<td>23.1</td>
<td>419</td>
<td>23.0</td>
<td>417</td>
<td>23.1</td>
<td>415</td>
<td>23.3</td>
<td>414</td>
<td>23.3</td>
<td>415</td>
<td>23.3</td>
</tr>
<tr>
<td>403.mcf</td>
<td>153</td>
<td>59.6</td>
<td>151</td>
<td>60.5</td>
<td>153</td>
<td>59.4</td>
<td>153</td>
<td>59.6</td>
<td>150</td>
<td>60.6</td>
<td>153</td>
<td>59.7</td>
</tr>
<tr>
<td>429.gcc</td>
<td>379</td>
<td>27.7</td>
<td>379</td>
<td>27.7</td>
<td>379</td>
<td>27.7</td>
<td>379</td>
<td>27.7</td>
<td>379</td>
<td>27.7</td>
<td>379</td>
<td>27.7</td>
</tr>
<tr>
<td>456.hmmer</td>
<td>119</td>
<td>78.5</td>
<td>119</td>
<td>78.7</td>
<td>118</td>
<td>78.8</td>
<td>119</td>
<td>78.6</td>
<td>119</td>
<td>78.7</td>
<td>118</td>
<td>78.8</td>
</tr>
<tr>
<td>438.sjeng</td>
<td>379</td>
<td>31.9</td>
<td>380</td>
<td>31.9</td>
<td>380</td>
<td>31.9</td>
<td>375</td>
<td>32.3</td>
<td>375</td>
<td>32.3</td>
<td>375</td>
<td>32.3</td>
</tr>
<tr>
<td>464.h264ref</td>
<td>426</td>
<td>52.0</td>
<td>426</td>
<td>52.0</td>
<td>426</td>
<td>51.9</td>
<td>426</td>
<td>52.0</td>
<td>426</td>
<td>52.0</td>
<td>426</td>
<td>51.9</td>
</tr>
<tr>
<td>471.onetopp</td>
<td>152</td>
<td>41.2</td>
<td>154</td>
<td>40.6</td>
<td>151</td>
<td>41.4</td>
<td>120</td>
<td>52.0</td>
<td>120</td>
<td>52.0</td>
<td>120</td>
<td>52.0</td>
</tr>
<tr>
<td>473.astar</td>
<td>208</td>
<td>33.7</td>
<td>207</td>
<td>33.9</td>
<td>209</td>
<td>33.7</td>
<td>208</td>
<td>33.7</td>
<td>208</td>
<td>33.7</td>
<td>210</td>
<td>33.5</td>
</tr>
<tr>
<td>483.xalancbmk</td>
<td>97.3</td>
<td>70.9</td>
<td>97.4</td>
<td>70.8</td>
<td>97.5</td>
<td>70.7</td>
<td>88.0</td>
<td>78.4</td>
<td>88.2</td>
<td>78.3</td>
<td>88.3</td>
<td>78.1</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"
echo always > /sys/kernel/mm/transparent_hugepage/enabled

**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
Memory Refresh Rate set to 1x Refresh
Sysinfo program /home/cpu2006/config/sysinfo.rev6914
$Rev: 6914 $ $Date:: 2014-06-25 #$ e3fbb8667b5a285932ceab81e28219e1
running on bl460c2-gen9-b Tue Mar 15 12:00:25 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
Continued on next page
Platform Notes (Continued)

From /proc/cpuinfo

model name : Intel(R) Xeon(R) CPU E5-2660 v4@ 2.00GHz
2 "physical id"s (chips)
28 "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 : 14
siblings : 14
physical 0: cores 0 2 4 5 6 8 9 10 11 12 13 14
physical 1: cores 0 2 4 5 6 8 9 10 11 12 13 14
cache size : 35840 KB

From /proc/meminfo
MemTotal: 264328628 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:
(8d714a0) x86_64 x86_64 x86_64 GNU/Linux

run-level 5 Mar 15 11:53

SPEC is set to: /home/cpu2006
Filesystem Type Size Used Avail Use% Mounted on
/dev/sda4 xfs 424G 218G 207G 52% /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
Continued on next page
Platform Notes (Continued)

determined", but the intent may not be met, as there are frequent changes to
hardware, firmware, and the "DMTF SMBIOS" standard.

BIOS HP I36 02/22/2016
Memory:
  8x UNKNOWN NOT AVAILABLE
  8x UNKNOWN NOT AVAILABLE 32 GB 2 rank 2400 MHz

(End of data from sysinfo program)
Regarding the sysinfo display about the memory installed, the correct amount of
memory is 256 GB and the dmidecode description should have one line reading as:
  8x UNKNOWN NOT AVAILABLE 32 GB 2 rank 2400 MHz

General Notes

Environment variables set by runspec before the start of the run:
KMP_AFFINITY = "granularity=fine,scatter"
LD_LIBRARY_PATH = "/home/cpu2006/libs/32:/home/cpu2006/libs/64:/home/cpu2006/sh"
OMP_NUM_THREADS = "28"

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
  483.xalancbmk: -DSPEC_CPU_LP64 -DSPEC_CPU_LINUX
Hewlett Packard Enterprise
(Test Sponsor: HPE)
ProLiant BL460c Gen9
(2.00 GHz, Intel Xeon E5-2660 v4)

SPECint2006 = 65.5
SPECint_base2006 = 63.0

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

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
429.mcf: -DSPEC_CPU_LP64
445.gobmk: -DSPEC_CPU_LP64
456.hmmer: -DSPEC_CPU_LP64
462.libquantum: -DSPEC_CPU_LP64 -DSPEC_CPU_LINUX
464.h264ref: -DSPEC_CPU_LP64
471.omnetpp: -D_FILE_OFFSET_BITS=64
473.astar: -DSPEC_CPU_LP64
483.xalancbmk: -D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LINUX
Hewlett Packard Enterprise
(Test Sponsor: HPE)
ProLiant BL460c Gen9
(2.00 GHz, Intel Xeon E5-2660 v4)

SPECint2006 = 65.5
SPECint_base2006 = 63.0

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

Peak Optimization Flags

C benchmarks:

400.perlbench: -xCORE-AVX2(pass 2) -prof-gen:threadsafepass 1)
-ipopass 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:threadsafepass 1)
-ipopass 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: -xCORE-AVX2 -ipo -O3 -no-prec-div -inline-calloc
-opt-malloc-options=3 -auto-ilp32

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:threadsafepass 1)
-ipopass 2) -O3(pass 2) -no-prec-div(pass 2)
-par-num-threads=1(pass 1) -prof-use(pass 2)

462.libquantum: basepeak = yes

464.h264ref: basepeak = yes

C++ benchmarks:

471.omnetpp: -xCORE-AVX2(pass 2) -prof-gen:threadsafepass 1)
-ipopass 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

Peak Other Flags

C benchmarks:

Continued on next page
Hewlett Packard Enterprise
(Test Sponsor: HPE)
ProLiant BL460c Gen9
(2.00 GHz, Intel Xeon E5-2660 v4)

SPECint2006 = 65.5
SPECint_base2006 = 63.0

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

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

Peak Other Flags (Continued)

403.gcc: -Dalloca=_alloca

The flags files that were used to format this result can be browsed at
http://www.spec.org/cpu2006/flags/HP-Platform-Flags-Intel-V1.2-HSW-revE.html
http://www.spec.org/cpu2006/flags/Intel-ic16.0-official-linux64.html

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

SPEC and SPECint are registered trademarks of the Standard Performance Evaluation Corporation. All other brand and product names appearing in this result are trademarks or registered trademarks of their respective holders.

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

Tested with SPEC CPU2006 v1.2.
Report generated on Tue May 3 18:00:46 2016 by SPEC CPU2006 PS/PDF formatter v6932.
Originally published on 3 May 2016.