Hewlett-Packard Company
ProLiant BL460c Gen9
(2.30 GHz, Intel Xeon E5-2670 v3)

SPECint®2006 = 59.1
SPECint_base2006 = 56.8

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

Test date: Nov-2014
Hardware Availability: Sep-2014
Software Availability: Sep-2014

400.perlbench 59.1
401.bzip2 56.8
403.gcc 56.8
429.mcf 54.7
445.gobmk 57.4
456.hmmer 61.2
458.sjeng 30.6
462.libquantum 60.0
464.h264ref 57.4
471.omnetpp 34.4
473.astar 30.1
483.xalancbmk 61.2

SPECint®2006 = 59.1
SPECint_base2006 = 56.8

**Hardware**

<table>
<thead>
<tr>
<th>Description</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU Name</td>
<td>Intel Xeon E5-2670 v3</td>
</tr>
<tr>
<td>CPU Characteristics</td>
<td>Intel Turbo Boost Technology up to 3.10 GHz</td>
</tr>
<tr>
<td>CPU MHz</td>
<td>2300</td>
</tr>
<tr>
<td>FPU</td>
<td>Integrated</td>
</tr>
<tr>
<td>CPU(s) enabled</td>
<td>24 cores, 2 chips, 12 cores/chip</td>
</tr>
<tr>
<td>CPU(s) orderable</td>
<td>1.2 chips</td>
</tr>
<tr>
<td>Primary Cache</td>
<td>32 KB I + 32 KB D on chip per core</td>
</tr>
<tr>
<td>Secondary Cache</td>
<td>256 KB I+D on chip per core</td>
</tr>
<tr>
<td>L3 Cache</td>
<td>30 MB I+D on chip per chip</td>
</tr>
<tr>
<td>Other Cache</td>
<td>None</td>
</tr>
<tr>
<td>Memory</td>
<td>256 GB (16 x 16 GB 2Rx4 PC4-2133P-R)</td>
</tr>
<tr>
<td>Disk Subsystem</td>
<td>2 x 400 GB SAS SSD, RAID 1</td>
</tr>
<tr>
<td>Other Hardware</td>
<td>None</td>
</tr>
</tbody>
</table>

**Software**

<table>
<thead>
<tr>
<th>Description</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating System</td>
<td>Red Hat Enterprise Linux Server release 7.0</td>
</tr>
<tr>
<td></td>
<td>(Maipo)</td>
</tr>
<tr>
<td></td>
<td>Kernel 3.10.0-123.el7.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>ext4</td>
</tr>
<tr>
<td>System State</td>
<td>Run level 3 (mulit-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>
Hewlett-Packard Company

ProLiant BL460c Gen9
(2.30 GHz, Intel Xeon E5-2670 v3)

SPECint2006 = 59.1
SPECint_base2006 = 56.8

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>
</tr>
</thead>
<tbody>
<tr>
<td>400.perlbench</td>
<td>270</td>
<td>36.1</td>
<td>271</td>
<td>36.1</td>
<td>270</td>
<td>36.2</td>
<td>234</td>
<td>41.8</td>
<td>234</td>
<td>41.8</td>
</tr>
<tr>
<td>401.bzip2</td>
<td>434</td>
<td>22.3</td>
<td>436</td>
<td>22.1</td>
<td>433</td>
<td>22.3</td>
<td>431</td>
<td>22.4</td>
<td>430</td>
<td>22.4</td>
</tr>
<tr>
<td>403.mcf</td>
<td>247</td>
<td>32.5</td>
<td>249</td>
<td>32.4</td>
<td>249</td>
<td>32.3</td>
<td>243</td>
<td>33.2</td>
<td>243</td>
<td>33.2</td>
</tr>
<tr>
<td>429.gcc</td>
<td>407</td>
<td>25.8</td>
<td>411</td>
<td>25.5</td>
<td>407</td>
<td>25.8</td>
<td>407</td>
<td>25.8</td>
<td>411</td>
<td>25.5</td>
</tr>
<tr>
<td>445.gobmk</td>
<td>152</td>
<td>61.1</td>
<td>152</td>
<td>61.2</td>
<td>152</td>
<td>61.2</td>
<td>153</td>
<td>61.1</td>
<td>152</td>
<td>61.2</td>
</tr>
<tr>
<td>456.hmmer</td>
<td>397</td>
<td>30.5</td>
<td>397</td>
<td>30.5</td>
<td>397</td>
<td>30.5</td>
<td>395</td>
<td>30.6</td>
<td>395</td>
<td>30.6</td>
</tr>
<tr>
<td>462.libquantum</td>
<td>3.49</td>
<td>5940</td>
<td>3.50</td>
<td>5920</td>
<td>3.51</td>
<td>5900</td>
<td>3.49</td>
<td>5940</td>
<td>3.50</td>
<td>5920</td>
</tr>
<tr>
<td>464.h264ref</td>
<td>519</td>
<td>42.6</td>
<td>518</td>
<td>42.7</td>
<td>524</td>
<td>42.3</td>
<td>519</td>
<td>42.6</td>
<td>518</td>
<td>42.7</td>
</tr>
<tr>
<td>471.omnetpp</td>
<td>182</td>
<td>34.4</td>
<td>186</td>
<td>33.6</td>
<td>178</td>
<td>35.2</td>
<td>136</td>
<td>46.0</td>
<td>136</td>
<td>46.1</td>
</tr>
<tr>
<td>473.astar</td>
<td>233</td>
<td>30.1</td>
<td>233</td>
<td>30.1</td>
<td>235</td>
<td>29.9</td>
<td>233</td>
<td>30.1</td>
<td>233</td>
<td>30.1</td>
</tr>
<tr>
<td>483.xalancbmk</td>
<td>115</td>
<td>60.2</td>
<td>115</td>
<td>60.0</td>
<td>115</td>
<td>59.8</td>
<td>115</td>
<td>60.2</td>
<td>115</td>
<td>60.0</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/redhat_transparent_hugepage/enabled

Platform Notes

BIOS Configuration:
  Intel Hyperthreading Options set to Disabled
  HP Power Profile set to Custom
  HP Power Regulator set 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
  Thermal Configuration set to Maximum Cooling
  Collaborative Power Control set to Disabled
  QPI Snoop Configuration set to Early Snoop
  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 Y-BL460cGen9-VP2 Sat Nov 29 22:37:49 2014

This section contains SUT (System Under Test) info as seen by some common utilities. To remove or add to this section, see:
Continued on next page
**Platform Notes (Continued)**

http://www.spec.org/cpu2006/Docs/config.html#sysinfo

From /proc/cpuinfo

```plaintext
model name : Intel(R) Xeon(R) CPU E5-2670 v3 @ 2.30GHz
2 "physical id"s (chips)
24 "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 : 12
siblings : 12
physical 0: cores 0 1 2 3 4 5 8 9 10 11 12 13
physical 1: cores 0 1 2 3 4 5 8 9 10 11 12 13
cache size : 30720 KB
```

From /proc/meminfo

```plaintext
MemTotal:       263846652 kB
HugePages_Total:       0
Hugepagesize:       2048 kB
```

From /etc/*release* /etc/*version*

```plaintext
os-release:
NAME="Red Hat Enterprise Linux Server"
VERSION="7.0 (Maipo)"
ID="rhel"
ID_LIKE="fedora"
VERSION_ID="7.0"
PRETTY_NAME="Red Hat Enterprise Linux Server 7.0 (Maipo)"
ANSI_COLOR="0;31"
CPE_NAME="cpe:/o:redhat:enterprise_linux:7.0:GA:server"
redhat-release: Red Hat Enterprise Linux Server release 7.0 (Maipo)
system-release: Red Hat Enterprise Linux Server release 7.0 (Maipo)
system-release-cpe: cpe:/o:redhat:enterprise_linux:7.0:ga:server
```

```plaintext
uname -a:
Linux Y-BL460cGen9-VP2 3.10.0-123.el7.x86_64 #1 SMP Mon May 5 11:16:57 EDT 2014 x86_64 x86_64 x86_64 GNU/Linux
```

```plaintext
run-level 3 Nov 29 22:33
```

```plaintext
SPEC is set to: /cpu2006
```

```
Filesystem      Type Size  Used Avail Use% Mounted on
/dev/mapper/rhel-root ext4  310G 116G  179G  40% /
```

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 I36 08/26/2014
Memory:
Hewlett-Packard Company
ProLiant BL460c Gen9
(2.30 GHz, Intel Xeon E5-2670 v3)

SPECint2006 = 59.1
SPECint_base2006 = 56.8

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

Test date: Nov-2014
Hardware Availability: Sep-2014
Software Availability: Sep-2014

Platform Notes (Continued)

16x HP 752369-081 16 GB 2 rank 2133 MHz

(End of data from sysinfo program)

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 = "24"

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
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
SPEC CINT2006 Result

Hewlett-Packard Company

ProLiant BL460c Gen9
(2.30 GHz, Intel Xeon E5-2670 v3)

SPECint2006 = 59.1
SPECint_base2006 = 56.8

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

Test date: Nov-2014
Hardware Availability: Sep-2014
Software Availability: Sep-2014

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
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

Continued on next page
Hewlett-Packard Company
ProLiant BL460c Gen9
(2.30 GHz, Intel Xeon E5-2670 v3)

SPECint2006 = 59.1
SPECint_base2006 = 56.8

Peak Optimization Flags (Continued)

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)
-03(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)
-03(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: 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-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
<table>
<thead>
<tr>
<th>SPECint2006</th>
<th>59.1</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECint_base2006</td>
<td>56.8</td>
</tr>
</tbody>
</table>

**Hewlett-Packard Company**

**ProLiant BL460c Gen9**  
(2.30 GHz, Intel Xeon E5-2670 v3)

**CPU2006 license:** 3  
**Test date:** Nov-2014

**Test sponsor:** Hewlett-Packard Company  
**Hardware Availability:** Sep-2014

**Tested by:** Hewlett-Packard Company  
**Software Availability:** Sep-2014

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.  
Originally published on 9 January 2015.