**Hewlett-Packard Company**

ProLiant BL460c Gen9
(2.30 GHz, Intel Xeon E5-2699 v3)

**SPECint\_rate\_2006 = 678**

**SPECint\_rate\_base\_2006 = 655**

<table>
<thead>
<tr>
<th>Test sponsor: Hewlett-Packard Company</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tested by: Hewlett-Packard Company</td>
</tr>
<tr>
<td>CPU2006 license: 3</td>
</tr>
<tr>
<td>Test date: Sep-2015</td>
</tr>
<tr>
<td>Hardware Availability: May-2015</td>
</tr>
<tr>
<td>Software Availability: Sep-2014</td>
</tr>
</tbody>
</table>

---

### Hardware

<table>
<thead>
<tr>
<th>CPU Name:</th>
<th>Intel Xeon E5-2699 v3</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU Characteristics:</td>
<td>Intel Turbo Boost Technology up to 3.60 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>18 cores, 1 chip, 18 cores/chip, 2 threads/core</td>
</tr>
<tr>
<td>CPU(s) orderable:</td>
<td>1,2 chip</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>45 MB I+D on chip per chip</td>
</tr>
<tr>
<td>Other Cache:</td>
<td>None</td>
</tr>
<tr>
<td>Memory:</td>
<td>128 GB (4 x 32 GB 2Rx4 PC4-2133P-R)</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>Operating System:</th>
<th>Red Hat Enterprise Linux Server release 7.0 (Maipo)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compiler:</td>
<td>C/C++: Version 15.0.0.090 of Intel C++ Studio XE for Linux</td>
</tr>
<tr>
<td>Auto Parallel:</td>
<td>No</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-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 E5-2699 v3)

SPEC CINT2006 Result

SPECint_rate2006 = 678
SPECint_rate_base2006 = 655

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

Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Copies</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Copies</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>36</td>
<td>657</td>
<td>536</td>
<td>655</td>
<td>537</td>
<td>657</td>
<td>537</td>
<td>36</td>
<td>524</td>
<td>671</td>
<td>655</td>
<td>537</td>
<td>657</td>
<td>537</td>
</tr>
<tr>
<td>401.bzip2</td>
<td>36</td>
<td>986</td>
<td>352</td>
<td>994</td>
<td>350</td>
<td>987</td>
<td>352</td>
<td>36</td>
<td>952</td>
<td>365</td>
<td>958</td>
<td>363</td>
<td>952</td>
<td>363</td>
</tr>
<tr>
<td>403.gcc</td>
<td>36</td>
<td>570</td>
<td>508</td>
<td>571</td>
<td>507</td>
<td>570</td>
<td>508</td>
<td>36</td>
<td>567</td>
<td>511</td>
<td>572</td>
<td>506</td>
<td>566</td>
<td>512</td>
</tr>
<tr>
<td>429.mcf</td>
<td>36</td>
<td>395</td>
<td>831</td>
<td>395</td>
<td>832</td>
<td>393</td>
<td>836</td>
<td>36</td>
<td>395</td>
<td>831</td>
<td>395</td>
<td>832</td>
<td>393</td>
<td>836</td>
</tr>
<tr>
<td>445.gobmk</td>
<td>36</td>
<td>374</td>
<td>488</td>
<td>776</td>
<td>487</td>
<td>775</td>
<td>487</td>
<td>36</td>
<td>762</td>
<td>496</td>
<td>761</td>
<td>496</td>
<td>765</td>
<td>494</td>
</tr>
<tr>
<td>456.hmmer</td>
<td>36</td>
<td>378</td>
<td>888</td>
<td>379</td>
<td>887</td>
<td>379</td>
<td>885</td>
<td>36</td>
<td>357</td>
<td>942</td>
<td>357</td>
<td>942</td>
<td>358</td>
<td>939</td>
</tr>
<tr>
<td>458.sjeng</td>
<td>36</td>
<td>801</td>
<td>544</td>
<td>810</td>
<td>538</td>
<td>812</td>
<td>536</td>
<td>36</td>
<td>776</td>
<td>561</td>
<td>778</td>
<td>560</td>
<td>779</td>
<td>559</td>
</tr>
<tr>
<td>462.libquantum</td>
<td>36</td>
<td>140</td>
<td>5340</td>
<td>140</td>
<td>5330</td>
<td>141</td>
<td>5300</td>
<td>36</td>
<td>140</td>
<td>5340</td>
<td>140</td>
<td>5330</td>
<td>141</td>
<td>5300</td>
</tr>
<tr>
<td>464.h264ref</td>
<td>36</td>
<td>932</td>
<td>855</td>
<td>935</td>
<td>852</td>
<td>937</td>
<td>851</td>
<td>36</td>
<td>923</td>
<td>863</td>
<td>931</td>
<td>856</td>
<td>918</td>
<td>868</td>
</tr>
<tr>
<td>471.omnetpp</td>
<td>36</td>
<td>700</td>
<td>322</td>
<td>695</td>
<td>324</td>
<td>698</td>
<td>322</td>
<td>36</td>
<td>683</td>
<td>329</td>
<td>673</td>
<td>334</td>
<td>675</td>
<td>334</td>
</tr>
<tr>
<td>473.astar</td>
<td>36</td>
<td>701</td>
<td>361</td>
<td>702</td>
<td>360</td>
<td>701</td>
<td>361</td>
<td>36</td>
<td>701</td>
<td>361</td>
<td>702</td>
<td>360</td>
<td>701</td>
<td>361</td>
</tr>
<tr>
<td>483.xalancbmk</td>
<td>36</td>
<td>392</td>
<td>634</td>
<td>393</td>
<td>632</td>
<td>392</td>
<td>634</td>
<td>36</td>
<td>392</td>
<td>634</td>
<td>393</td>
<td>632</td>
<td>392</td>
<td>634</td>
</tr>
</tbody>
</table>

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

Submit Notes

The numactl mechanism was used to bind copies to processors. The config file option 'submit' was used to generate numactl commands to bind each copy to a specific processor. For details, please see the config file.

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
Filesystem page cache cleared with:
   echo 1>       /proc/sys/vm/drop_caches
runspec command invoked through numactl i.e.:
numactl --interleave=all runspec <etc>

Platform Notes

BIOS Configuration:
   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
Energy/Performance Bias set to Maximum Performance
Collaborative Power Control set to Disabled
QPI Snoop Configuration set to Cluster on Die
Thermal Configuration set to Maximum Cooling
Processor Power and Utilization Monitoring set to Disabled
Memory Refresh Rate set to 1x Refresh

Continued on next page
Platform Notes (Continued)

Sysinfo program /cpu2006/config/sysinfo.rev6914
$Rev: 6914 $ $Date:: 2014-06-25 #$ e3fbb8667b5a285932ceab81e28219e1
running on BL460c-Gen9-cpu2006 Tue Sep 29 20:17:22 2015

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

From /proc/cpuinfo
model name : Intel(R) Xeon(R) CPU E5-2699 v3 @ 2.30GHz
            1 "physical id"s (chips)
            36 "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 : 9
siblings : 18
physical 0: cores 0 1 2 3 4 8 9 10 11 16 17 18 19 20 24 25 26 27
cache size : 23040 KB

From /proc/meminfo
MemTotal:       131731880 kB
HugePages_Total:       0
Hugepagesize:       2048 kB

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

uname -a:
Linux BL460c-Gen9-cpu2006 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

run-level 3 Sep 29 20:14

SPEC is set to: /cpu2006
Filesystem Type Size Used Avail Use% Mounted on
/dev/sda4  xfs  368G  6.5G  361G  2% /

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 I36 05/06/2015
Memory:
12x UNKNOWN NOT AVAILABLE
4x UNKNOWN NOT AVAILABLE 32 GB 2 rank 2133 MHz

(End of data from syinfo program)
Regarding the syinfo display about the memory installed, the correct amount of
memory is 128 GB and the dmidecode description should have one line reading as:
4x UNKNOWN NOT AVAILABLE 32 GB 2 rank 2133 MHz

General Notes

Environment variables set by runspec before the start of the run:
LD_LIBRARY_PATH = "/cpu2006/libs/32:/cpu2006/libs/64:/cpu2006/sh"

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

Base Compiler Invocation

C benchmarks:
   icc -m32 -L/opt/intel/composer_xe_2015/lib/ia32

C++ benchmarks:
   icpc -m32 -L/opt/intel/composer_xe_2015/lib/ia32

Base Portability Flags

400.perlbench: -DSPEC_CPU_LINUX_IA32
462.libquantum: -DSPEC_CPU_LINUX
483.xalancbmk: -DSPEC_CPU_LINUX

Base Optimization Flags

C benchmarks:
   -xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch
   -opt-mem-layout-trans=3

C++ benchmarks:
   -xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch
   -opt-mem-layout-trans=3 -Wl,-z,muldefs -L/sh -lsmartheap
Hewlett-Packard Company
ProLiant BL460c Gen9
(2.30 GHz, Intel Xeon E5-2699 v3)

SPECint\textsubscript{rate}2006 = 678
SPECint\textsubscript{rate\_base}2006 = 655

CPU\textsubscript{2006} license: 3
Test sponsor: Hewlett-Packard Company
Tested by: Hewlett-Packard Company

**Base Other Flags**

C benchmarks:

403.gcc: -Dalloca=_alloca

**Peak Compiler Invocation**

C benchmarks (except as noted below):

```bash
icc -m32 -L/opt/intel/composer_xe_2015/lib/ia32
```

400.perlbench: `icc -m64`

401.bzip2: `icc -m64`

456.hmmer: `icc -m64`

458.sjeng: `icc -m64`

C++ benchmarks:

```bash
icpc -m32 -L/opt/intel/composer_xe_2015/lib/ia32
```

**Peak Portability Flags**

400.perlbench: `-DSPEC\_CPU\_LP64 -DSPEC\_CPU\_LINUX\_X64`

401.bzip2: `-DSPEC\_CPU\_LP64`

456.hmmer: `-DSPEC\_CPU\_LP64`

458.sjeng: `-DSPEC\_CPU\_LP64`

462.libquantum: `-DSPEC\_CPU\_LINUX`

483.xalancbmk: `-DSPEC\_CPU\_LINUX`

**Peak Optimization Flags**

C benchmarks:

```bash
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) -auto-ilp32
```

```bash
401.bzip2: -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 -auto-ilp32 -ansi-alias
```

```bash
403.gcc: -xCORE-AVX2 -ipo -O3 -no-prec-div
```

Continued on next page
**SPEC CINT2006 Result**

Hewlett-Packard Company
ProLiant BL460c Gen9
(2.30 GHz, Intel Xeon E5-2699 v3)

<table>
<thead>
<tr>
<th>SPECint_rate2006</th>
<th>678</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECint_rate_base2006</td>
<td>655</td>
</tr>
</tbody>
</table>

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

### Peak Optimization Flags (Continued)

429.mcf: `basepeak = yes`

445.gobmk: `-xCORE-AVX2(pass 2) -prof-gen(pass 1) -prof-use(pass 2)`
| -ansi-alias -opt-mem-layout-trans=3 |

456.hmmer: `-xCORE-AVX2 -ipo -O3 -no-prec-div -unroll2 -auto-ilp32`

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) |
| -unroll2 -auto-ilp32 |

462.libquantum: `basepeak = yes`

464.h264ref: `-xCORE-AVX2(pass 2) -prof-gen(pass 1) -ipo(pass 2)`
| -O3(pass 2) -no-prec-div(pass 2) -prof-use(pass 2) |
| -unroll2 -ansi-alias |

**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) |
| -ansi-alias -opt-ra-region-strategy=block -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
## SPEC CINT2006 Result

<table>
<thead>
<tr>
<th>Hewlett-Packard Company</th>
<th>SPECint_rate2006</th>
<th>678</th>
</tr>
</thead>
<tbody>
<tr>
<td>ProLiant BL460c Gen9</td>
<td>SPECint_rate_base2006</td>
<td>655</td>
</tr>
<tr>
<td>(2.30 GHz, Intel Xeon E5-2699 v3)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**CPU2006 license:** 3  
**Test sponsor:** Hewlett-Packard Company  
**Tested by:** Hewlett-Packard Company  
**Test date:** Sep-2015  
**Hardware Availability:** May-2015  
**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 20 October 2015.