# SPEC® CINT2006 Result

## Hewlett-Packard Company

ProLiant BL460c Gen9  
(1.80 GHz, Intel Xeon E5-2650L v3)

<table>
<thead>
<tr>
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<th>Tested by: Hewlett-Packard Company</th>
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<tr>
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<td>Software Availability: Sep-2014</td>
<td></td>
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</table>

## SPECint_rate2006 = 823  
SPECint_rate_base2006 = 788

### Hardware

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
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</thead>
<tbody>
<tr>
<td>CPU Name:</td>
<td>Intel Xeon E5-2650L v3</td>
</tr>
<tr>
<td>CPU Characteristics:</td>
<td>Intel Turbo Boost Technology up to 2.50 GHz</td>
</tr>
<tr>
<td>CPU MHz:</td>
<td>1800</td>
</tr>
<tr>
<td>FPU:</td>
<td>Integrated</td>
</tr>
<tr>
<td>CPU(s) enabled:</td>
<td>24 cores, 2 chips, 12 cores/chip, 2 threads/core</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>
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</table>

### Software

<table>
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<tr>
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</table>
| Operating System:        | Red Hat Enterprise Linux Server release 7.0 (Maipo)  
Kernel 3.10.0-123.el7.x86_64 |
| Compiler:                | C/C++: Version 15.0.0.090 of Intel C++ Studio XE for Linux |
| Auto Parallel:           | No                                   |
| File System:             | xfs                                  |
| System State:            | Run level 3 (multi-user)             |
| Base Pointers:           | 32-bit                               |
| Peak Pointers:           | 32/64-bit                            |
| Other Software:          | Microquill SmartHeap V10.0           |
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**SPEC CINT2006 Result**

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**Hewlett-Packard Company**

(CPU2006 license: 3)

Test sponsor: Hewlett-Packard Company

Tested by: Hewlett-Packard Company

<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>
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<tbody>
<tr>
<td>400.perlbench</td>
<td>48</td>
<td>849</td>
<td>553</td>
<td>852</td>
<td>550</td>
<td>849</td>
<td>553</td>
</tr>
<tr>
<td>401.bzip2</td>
<td>48</td>
<td>1172</td>
<td>395</td>
<td>1166</td>
<td>397</td>
<td>1169</td>
<td>396</td>
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<td>403.gcc</td>
<td>48</td>
<td>608</td>
<td>636</td>
<td>605</td>
<td>638</td>
<td>611</td>
<td>632</td>
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<td>429.mcf</td>
<td>48</td>
<td>389</td>
<td>1120</td>
<td>389</td>
<td>1120</td>
<td>387</td>
<td>1130</td>
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<td>445.gobmk</td>
<td>48</td>
<td>969</td>
<td>520</td>
<td>967</td>
<td>520</td>
<td>967</td>
<td>521</td>
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<tr>
<td>456.hmmer</td>
<td>48</td>
<td>434</td>
<td>1030</td>
<td>427</td>
<td>1050</td>
<td>431</td>
<td>1040</td>
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<tr>
<td>458.sjeng</td>
<td>48</td>
<td>1047</td>
<td>555</td>
<td>1037</td>
<td>560</td>
<td>1048</td>
<td>554</td>
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<tr>
<td>462.libquantum</td>
<td>48</td>
<td>134</td>
<td>7450</td>
<td>134</td>
<td>7440</td>
<td>134</td>
<td>7450</td>
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<tr>
<td>464.h264ref</td>
<td>48</td>
<td>1212</td>
<td>876</td>
<td>1211</td>
<td>877</td>
<td>1211</td>
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<tr>
<td>471.omnetpp</td>
<td>48</td>
<td>619</td>
<td>484</td>
<td>623</td>
<td>482</td>
<td>620</td>
<td>484</td>
</tr>
<tr>
<td>473.astar</td>
<td>48</td>
<td>747</td>
<td>451</td>
<td>748</td>
<td>450</td>
<td>746</td>
<td>452</td>
</tr>
<tr>
<td>483.xalancbmk</td>
<td>48</td>
<td>388</td>
<td>854</td>
<td>387</td>
<td>855</td>
<td>389</td>
<td>852</td>
</tr>
</tbody>
</table>

Results 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/redhat_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
- Thermal Configuration set to Maximum Cooling
- Collaborative Power Control set to Disabled
- QPI Snoop Configuration set to Cluster on Die
- Processor Power and Utilization Monitoring set to Disabled
- Memory Refresh Rate set to 1x Refresh

Sysinfo program /cpu2006/config/sysinfo.rev6914

Continued on next page
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CPU2006 license: 3
Test sponsor: Hewlett-Packard Company
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Platform Notes (Continued)

$Rev: 6914 $ $Date:: 2014-06-25 #$ e3fbb8667bSa285932ceab81e28219e1
running on W-b1460c_gen9-VP2.1 Thu Nov 20 15:41:04 2014

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 E5-2650L v3 @ 1.80GHz
2 "physical id"s (chips)
48 "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 : 6
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 : 15360 KB

From /proc/meminfo
MemTotal:       263842680 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 W-b1460c_gen9-VP2.1 3.10.0-123.e17.x86_64 #1 SMP Mon May 5 11:16:57 EDT
2014 x86_64 x86_64 x86_64 GNU/Linux

run-level 3 Nov 20 15:38

SPEC is set to: /cpu2006
Filesystem     Type  Size  Used Avail Use% Mounted on
/dev/sda4      xfs  277G  49G  229G  18% /

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
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### 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 08/26/2014**  
**Memory:**  
2x HP 752369-081 16 GB 2 rank 2133 MHz  
14x HP NOT AVAILABLE 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:  
```
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
```
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<td>icc -m64</td>
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<td>icc -m64</td>
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**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**

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

**Hardware Availability:** Sep-2014

**Software Availability:** Sep-2014

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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)
-unroll4 -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
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