Hewlett-Packard Company

ProLiant BL460c Gen8
(2.60 GHz, Intel Xeon E5-2670)

<table>
<thead>
<tr>
<th>spec</th>
<th>SPEC ® CINT2006 Result</th>
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<tbody>
<tr>
<td></td>
<td>Hewlett-Packard Company</td>
</tr>
<tr>
<td></td>
<td>SPECint®_rate2006 = 646</td>
</tr>
<tr>
<td></td>
<td>SPECint_rate_base2006 = 621</td>
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</tbody>
</table>

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

Hardware

<table>
<thead>
<tr>
<th>CPU Name:</th>
<th>Intel Xeon E5-2670</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU Characteristics:</td>
<td>Intel Turbo Boost Technology up to 3.30 GHz</td>
</tr>
<tr>
<td>CPU MHZ:</td>
<td>2600</td>
</tr>
<tr>
<td>FPU:</td>
<td>Integrated</td>
</tr>
<tr>
<td>CPU(s) enabled:</td>
<td>16 cores, 2 chips, 8 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>20 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 (16 x 8 GB 2Rx4 PC3-12800R-11, ECC)</td>
</tr>
<tr>
<td>Disk Subsystem:</td>
<td>2 x 146 GB 15 K SAS, RAID 1</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 6.2, (Santiago)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compiler:</td>
<td>C/C++: Version 12.1.2.273 of Intel C++ Studio XE for Linux</td>
</tr>
<tr>
<td>Auto Parallel:</td>
<td>No</td>
</tr>
<tr>
<td>File System:</td>
<td>ext4</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 V9.01, HP Array Configuration Utility, CLI version</td>
</tr>
</tbody>
</table>

| Test date: | Apr-2012 |
| Hardware Availability: | Jun-2012 |
| Software Availability: | Mar-2012 |

| 400.perlbench | 472 |
| 401.bzip2 | 353 |
| 403.gcc | 500 |
| 429.mcf | 952 |
| 445.gobmk | 483 |
| 456.hmmer | 934 |
| 458.sjeng | 790 |
| 462.libquantum | 3700 |
| 464.h264ref | 802 |
| 471.omnetpp | 376 |
| 473.astar | 355 |
| 483.xalancbmk | 656 |
SPEC CINT2006 Result

Hewlett-Packard Company

ProLiant BL460c Gen8
(2.60 GHz, Intel Xeon E5-2670)

SPECint_rate2006 = 646
SPECint_rate_base2006 = 621

CPU2006 license: 3
Test sponsor: Hewlett-Packard Company
Tested by: Hewlett-Packard Company
Test date: Apr-2012
Hardware Availability: Jun-2012
Software Availability: Mar-2012

Results Table

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<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>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
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</thead>
<tbody>
<tr>
<td>400.perlbench</td>
<td>32</td>
<td>661</td>
<td>473</td>
<td>664</td>
<td>471</td>
<td>662</td>
<td>472</td>
<td>32</td>
<td>575</td>
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<tr>
<td>401.bzip2</td>
<td>32</td>
<td>901</td>
<td>343</td>
<td>902</td>
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<td>403.gcc</td>
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<td>445.gobmk</td>
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<td>471</td>
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<td>471</td>
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<td>456.hmmer</td>
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<td>458.sjeng</td>
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</tr>
<tr>
<td>471.omnetpp</td>
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<td>355</td>
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<td>564</td>
<td>355</td>
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<td>532</td>
<td>376</td>
<td>533</td>
</tr>
<tr>
<td>473.astar</td>
<td>32</td>
<td>619</td>
<td>363</td>
<td>621</td>
<td>362</td>
<td>618</td>
<td>363</td>
<td>32</td>
<td>619</td>
<td>363</td>
<td>621</td>
</tr>
<tr>
<td>483.xalancbmk</td>
<td>32</td>
<td>337</td>
<td>656</td>
<td>337</td>
<td>656</td>
<td>336</td>
<td>657</td>
<td>32</td>
<td>337</td>
<td>656</td>
<td>336</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/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>
Drive Write Cache set to Enabled in HP Array Configuration Utility, CLI version
Accelerator Ratio for Reads/Writes set to = 100% Read / 0% Write in HP Array Configuration Utility, CLI version

Platform Notes

BIOS Configuration:
  HP Power Profile set to Custom
Energy/Performance Bias is set to Maximum Performance
Thermal Configuration set to Maximum Cooling
Collaborative Power Control set to Disabled
Processor Power and Utilization Monitoring set to Disabled
Sysinfo program /cpu2006/config/sysinfo.rev6800
$Rev: 6800 $ $Date:: 2011-10-11 #$ 6f2ebdf5032aaa42e583f96b07f99d3
running on rh62 Fri Apr 20 17:17:59 2012

Continued on next page
**Platform Notes (Continued)**

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 E5-2670 0 @ 2.60GHz
- `2 "physical id"s (chips)`
- `32 "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`: 8
  - `siblings`: 16
  - `physical 0: cores 0 1 2 3 4 5 6 7`
  - `physical 1: cores 0 1 2 3 4 5 6 7`
  - `cache size`: 20480 KB

From `/proc/meminfo`

- `MemTotal: 132120004 kB`
- `HugePages_Total: 0`
- `Hugepagesize: 2048 kB`

```
/usr/bin/lsb_release -d
Red Hat Enterprise Linux Server release 6.2 (Santiago)
```

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

- `redhat-release: Red Hat Enterprise Linux Server release 6.2 (Santiago)`
- `system-release: Red Hat Enterprise Linux Server release 6.2 (Santiago)`

```
uname -a:
Linux rh62 2.6.32-220.el6.x86_64 #1 SMP Wed Nov 9 08:03:13 EST 2011 x86_64
x86_64 x86_64 GNU/Linux
```

```
run-level 3 Apr 20 16:47
```

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

```
Filesystem    Type    Size  Used Avail Use% Mounted on
/dev/mapper/vg_rh62-lv_root
  ext4          50G  18G  30G  37% /
```

Additional information from dmidecode:

- **BIOS HP I31 02/13/2012**
- **Memory:**
  - `16x Not Specified Not Specified 8 GB 1600 MHz 2 rank`

(End of data from sysinfo program)
## SPEC CINT2006 Result

### Hewlett-Packard Company

ProLiant BL460c Gen8
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<th>SPECint_rate2006</th>
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**CPU2006 license:** 3  
**Test sponsor:** Hewlett-Packard Company  
**Tested by:** Hewlett-Packard Company  
**Test date:** Apr-2012  
**Hardware Availability:** Jun-2012  
**Tested by:** Hewlett-Packard Company  
**Software Availability:** Mar-2012  

### General Notes

Environment variables set by runspec before the start of the run:
- `KMP_AFFINITY = "granularity=fine,compact,1,0"
- `LD_LIBRARY_PATH = "/cpu2006/libs2/32:/cpu2006/libs2/64"

Binaries compiled on a system with 2x Xeon E5-2667 CPU + 256GB memory using SLES11 SP2, RC3

### Base Compiler Invocation

**C benchmarks:**
```
icc  -m32
```

**C++ benchmarks:**
```
icpc -m32
```

### Base Portability Flags

- 400.perlibench: `-DSPEC_CPU_LINUX_IA32`
- 462.libquantum: `-DSPEC_CPU_LINUX`
- 483.xalancbmk: `-DSPEC_CPU_LINUX`

### Base Optimization Flags

**C benchmarks:**
```
-xSSE4.2  -ipo  -O3  -no-prec-div  -opt-prefetch  -opt-mem-layout-trans=3
```

**C++ benchmarks:**
```
-xSSE4.2  -ipo  -O3  -no-prec-div  -opt-prefetch  -opt-mem-layout-trans=3  
-Wl,-z,muldefs -L/spec/libs2/32 -lsmartheap
```

### Base Other Flags

**C benchmarks:**
```
403.gcc: `-Dalloca=_alloca`
```

### Peak Compiler Invocation

**C benchmarks (except as noted below):**
```
icc  -m32
```

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Hewlett-Packard Company
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SPECint_rate2006 = 646
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CPU2006 license: 3
Test sponsor: Hewlett-Packard Company
Tested by: Hewlett-Packard Company

Peak Compiler Invocation (Continued)

400.perlbench: icc -m64
401.bzip2: icc -m64
456.hmmer: icc -m64
458.sjeng: icc -m64

C++ benchmarks:
icpc -m32

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:
400.perlbench: -xSSE4.2(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: -xSSE4.2(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: basepeak = yes
429.mcf: basepeak = yes
445.gobmk: -xSSE4.2(pass 2) -prof-gen(pass 1) -prof-use(pass 2)
-ansi-alias -opt-mem-layout-trans=3
456.hmmer: -xSSE4.2 -ipo -O3 -no-prec-div -unroll2 -auto-ilp32
458.sjeng: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2)
-O3(pass 2) -no-prec-div(pass 2) -prof-use(pass 2)
-unroll4 -auto-ilp32

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Hewlett-Packard Company
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<td>Jun-2012</td>
</tr>
<tr>
<td>Software Availability:</td>
<td>Mar-2012</td>
</tr>
</tbody>
</table>

Peak Optimization Flags (Continued)

462.libquantum: basepeak = yes
464.h264ref: -xSSE4.2(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: -xSSE4.2(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/spec/libs2/32 -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/HP-Platform-Flags-Intel-V1.2-A.20120425.html
http://www.spec.org/cpu2006/flags/Intel-ic12.1-official-linux64.20120425.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-A.20120425.xml
http://www.spec.org/cpu2006/flags/Intel-ic12.1-official-linux64.20120425.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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