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

SPEC® CFP2006 Result

| SPECfp®2006 = 110 |
| SPECfp_base2006 = 105 |

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

### Hardware
- CPU Name: Intel Xeon E5-2670 v3
- CPU Characteristics: Intel Turbo Boost Technology up to 3.10 GHz
- CPU MHz: 2300
- FPU: Integrated
- CPU(s) enabled: 24 cores, 2 chips, 12 cores/chip
- CPU(s) orderable: 1,2 chips
- Primary Cache: 32 KB I + 32 KB D on chip per core
- Secondary Cache: 256 KB I+D on chip per core

### Software
- Operating System: Red Hat Enterprise Linux Server release 7.0 (Maipo)
- Compiler: C/C++: Version 15.0.0.090 of Intel C++ Studio XE for Linux;
  Fortran: Version 15.0.0.090 of Intel Fortran Studio XE for Linux
- Auto Parallel: Yes
- File System: ext4

---

### SPEC2006 Results

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>410.bwaves</td>
<td>37.6</td>
</tr>
<tr>
<td>416.gamess</td>
<td>32.5</td>
</tr>
<tr>
<td>433.milc</td>
<td>65.7</td>
</tr>
<tr>
<td>434.zeusmp</td>
<td>210</td>
</tr>
<tr>
<td>435.gromacs</td>
<td>39.9</td>
</tr>
<tr>
<td>436.cactusADM</td>
<td>886</td>
</tr>
<tr>
<td>437.leslie3d</td>
<td>384</td>
</tr>
<tr>
<td>444.namd</td>
<td>26.9</td>
</tr>
<tr>
<td>447.dealII</td>
<td>50.6</td>
</tr>
<tr>
<td>450.soplex</td>
<td>42.0</td>
</tr>
<tr>
<td>453.povray</td>
<td>55.8</td>
</tr>
<tr>
<td>454.calculix</td>
<td>49.1</td>
</tr>
<tr>
<td>459.GemsFDTD</td>
<td>48.5</td>
</tr>
<tr>
<td>465.tonto</td>
<td>46.4</td>
</tr>
<tr>
<td>470.lbm</td>
<td>37.0</td>
</tr>
<tr>
<td>481.wrf</td>
<td>110</td>
</tr>
<tr>
<td>482.sphinx3</td>
<td>69.4</td>
</tr>
</tbody>
</table>

---

**Continued on next page**
**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></td>
<td>Base</td>
<td>Peak</td>
<td>Base</td>
<td>Peak</td>
<td>Base</td>
<td>Peak</td>
<td>Base</td>
<td>Peak</td>
<td>Base</td>
<td>Peak</td>
<td>Base</td>
<td>Peak</td>
</tr>
<tr>
<td>410.bwaves</td>
<td>25.4</td>
<td>535</td>
<td>24.6</td>
<td>553</td>
<td>24.8</td>
<td>547</td>
<td>25.4</td>
<td>535</td>
<td>24.6</td>
<td>553</td>
<td>24.8</td>
<td>547</td>
</tr>
<tr>
<td>416.gamess</td>
<td>603</td>
<td>32.5</td>
<td>601</td>
<td>32.6</td>
<td>606</td>
<td>32.3</td>
<td>524</td>
<td>37.4</td>
<td>520</td>
<td>37.6</td>
<td>521</td>
<td>37.6</td>
</tr>
<tr>
<td>433.milc</td>
<td>141</td>
<td>65.2</td>
<td>141</td>
<td>65.1</td>
<td>141</td>
<td>65.1</td>
<td>140</td>
<td>65.7</td>
<td>140</td>
<td>65.7</td>
<td>139</td>
<td>65.9</td>
</tr>
<tr>
<td>434.zeusmp</td>
<td>43.3</td>
<td>210</td>
<td>43.3</td>
<td>210</td>
<td>43.3</td>
<td>210</td>
<td>43.3</td>
<td>210</td>
<td>43.3</td>
<td>210</td>
<td>43.3</td>
<td>210</td>
</tr>
<tr>
<td>435.gromacs</td>
<td>179</td>
<td>39.9</td>
<td>180</td>
<td>39.6</td>
<td>179</td>
<td>40.0</td>
<td>179</td>
<td>39.9</td>
<td>179</td>
<td>39.6</td>
<td>179</td>
<td>40.0</td>
</tr>
<tr>
<td>436.cactusADM</td>
<td>13.5</td>
<td>886</td>
<td>13.6</td>
<td>877</td>
<td>13.3</td>
<td>899</td>
<td>13.5</td>
<td>886</td>
<td>13.6</td>
<td>877</td>
<td>13.3</td>
<td>899</td>
</tr>
<tr>
<td>437.leslie3d</td>
<td>23.7</td>
<td>396</td>
<td>24.5</td>
<td>384</td>
<td>24.6</td>
<td>383</td>
<td>23.7</td>
<td>396</td>
<td>24.5</td>
<td>384</td>
<td>24.6</td>
<td>383</td>
</tr>
<tr>
<td>447.dealII</td>
<td>226</td>
<td>50.6</td>
<td>226</td>
<td>50.6</td>
<td>226</td>
<td>50.6</td>
<td>226</td>
<td>50.6</td>
<td>226</td>
<td>50.6</td>
<td>226</td>
<td>50.6</td>
</tr>
<tr>
<td>450.soplex</td>
<td>199</td>
<td>42.0</td>
<td>199</td>
<td>41.9</td>
<td>198</td>
<td>42.2</td>
<td>199</td>
<td>42.0</td>
<td>199</td>
<td>41.9</td>
<td>198</td>
<td>42.2</td>
</tr>
<tr>
<td>453.povray</td>
<td>108</td>
<td>49.2</td>
<td>108</td>
<td>49.1</td>
<td>109</td>
<td>49.0</td>
<td>95.4</td>
<td>55.8</td>
<td>92.7</td>
<td>57.4</td>
<td>96.5</td>
<td>55.1</td>
</tr>
<tr>
<td>454.calculix</td>
<td>170</td>
<td>48.4</td>
<td>170</td>
<td>48.5</td>
<td>170</td>
<td>48.5</td>
<td>157</td>
<td>52.6</td>
<td>157</td>
<td>52.7</td>
<td>157</td>
<td>52.6</td>
</tr>
<tr>
<td>459.GemsFDTD</td>
<td>46.0</td>
<td>231</td>
<td>44.8</td>
<td>237</td>
<td>44.5</td>
<td>239</td>
<td>37.9</td>
<td>280</td>
<td>38.1</td>
<td>279</td>
<td>38.1</td>
<td>278</td>
</tr>
<tr>
<td>465.tonto</td>
<td>266</td>
<td>37.0</td>
<td>266</td>
<td>37.0</td>
<td>268</td>
<td>36.7</td>
<td>212</td>
<td>46.5</td>
<td>212</td>
<td>46.3</td>
<td>212</td>
<td>46.4</td>
</tr>
<tr>
<td>470.lbm</td>
<td>17.4</td>
<td>791</td>
<td>17.5</td>
<td>786</td>
<td>17.8</td>
<td>771</td>
<td>17.4</td>
<td>791</td>
<td>17.5</td>
<td>786</td>
<td>17.8</td>
<td>771</td>
</tr>
<tr>
<td>481.wrf</td>
<td>102</td>
<td>110</td>
<td>101</td>
<td>111</td>
<td>101</td>
<td>110</td>
<td>102</td>
<td>110</td>
<td>101</td>
<td>111</td>
<td>101</td>
<td>110</td>
</tr>
<tr>
<td>482.sphinx3</td>
<td>277</td>
<td>70.4</td>
<td>288</td>
<td>67.6</td>
<td>281</td>
<td>69.4</td>
<td>277</td>
<td>70.4</td>
<td>288</td>
<td>67.6</td>
<td>281</td>
<td>69.4</td>
</tr>
</tbody>
</table>

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

### 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 Package State set to C6 State
- Thermal Configuration set to Maximum Cooling
- Collaborative Power Control set to Disabled

Continued on next page
SPEC CFP2006 Result

Hewlett-Packard Company

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

SPECfp2006 = 110
SPECfp_base2006 = 105

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

Platform Notes (Continued)

QPI Snoop Configuration set to Home 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 Tue Dec 2 14:43:49 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 E5-2670 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
cautions.)
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

From /proc/meminfo
MemTotal: 263845292 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 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

run-level 3 Dec 2 14:42

SPEC is set to: /cpu2006

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

Continued on next page
**SPEC CFP2006 Result**

**Hewlett-Packard Company**

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

| SPECfp2006 | 110 |
|---------------------------|
| SPECfp_base2006 | 105 |

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

**Platform Notes (Continued)**

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:
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,compact"
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:

```plaintext
icc   -m64
```

C++ benchmarks:

```plaintext
icpc  -m64
```

Fortran benchmarks:

```plaintext
ifort -m64
```

Benchmarks using both Fortran and C:

```plaintext
icc   -m64 ifort -m64
```

**Base Portability Flags**

- 410.bwaves: -DSPEC_CPU_LP64
- 416.gmres: -DSPEC_CPU_LP64
- 433.milc: -DSPEC_CPU_LP64
- 434.zeusmp: -DSPEC_CPU_LP64
- 435.gromacs: -DSPEC_CPU_LP64 -nofor_main
- 436.cactusADM: -DSPEC_CPU_LP64 -nofor_main
- 437.leslie3d: -DSPEC_CPU_LP64

Continued on next page
SPEC CFP2006 Result

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

SPECfp2006 = 110
SPECfp_base2006 = 105

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

Base Portability Flags (Continued)

444.namd: -DSPEC_CPU_LP64
447.dealII: -DSPEC_CPU_LP64
450.soplex: -DSPEC_CPU_LP64
453.povray: -DSPEC_CPU_LP64
454.calculix: -DSPEC_CPU_LP64 -nofor_main
459.GemsFDTD: -DSPEC_CPU_LP64
465.tonto: -DSPEC_CPU_LP64
470.lbm: -DSPEC_CPU_LP64
481.wrf: -DSPEC_CPU_LP64 -DSPEC_CPU_CASE_FLAG -DSPEC_CPU_LINUX
482.sphinx3: -DSPEC_CPU_LP64

Base Optimization Flags

C benchmarks:
-xCORE-AVX2 -ipo -O3 -no-prec-div -parallel -opt-prefetch
-ansi-alias

C++ benchmarks:
-xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch -ansi-alias

Fortran benchmarks:
-xCORE-AVX2 -ipo -O3 -no-prec-div -parallel -opt-prefetch

Benchmarks using both Fortran and C:
-xCORE-AVX2 -ipo -O3 -no-prec-div -parallel -opt-prefetch
-ansi-alias

Peak Compiler Invocation

C benchmarks:
icc -m64

C++ benchmarks:
icpc -m64

Fortran benchmarks:
ifort -m64

Benchmarks using both Fortran and C:
icc -m64 ifort -m64
### Peak Portability Flags

Same as Base Portability Flags

### Peak Optimization Flags

**C benchmarks:**

- 433.milc: `-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 -ansi-alias`
- 470.lbm: `basepeak = yes`
- 482.sphinx3: `basepeak = yes`

**C++ benchmarks:**

- 444.namd: `-xCORE-AVX2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2) -prof-use(pass 2) -fno-alias -auto-ilp32`
- 447.dealII: `basepeak = yes`
- 450.soplex: `basepeak = yes`
- 453.povray: `-xCORE-AVX2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2) -prof-use(pass 2) -unroll4 -ansi-alias`

**Fortran benchmarks:**

- 410.bwaves: `basepeak = yes`
- 416.gamess: `-xCORE-AVX2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2) -prof-use(pass 2) -unroll2 -inline-level=0 -scalar-rep-
- 434.zeusmp: `basepeak = yes`
- 437.leslie3d: `basepeak = yes`
- 459.GemsFDTD: `-xCORE-AVX2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2) -prof-use(pass 2) -unroll2 -inline-level=0 -opt-prefetch -parallel`
- 465.tonto: `-xCORE-AVX2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2) -prof-use(pass 2) -inline-calloc -opt-malloc-options=3 -auto -unroll4`

Continued on next page
Hewlett-Packard Company

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

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

SPECfp2006 = 110
SPECfp_base2006 = 105

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

Peak Optimization Flags (Continued)

Benchmarks using both Fortran and C:

435.gromacs: basepeak = yes
436.cactusADM: basepeak = yes
454.calculix: -xCORE-AVX2 -ipo -O3 -no-prec-div -auto-ilp32 -ansi-alias
481.wrf: basepeak = yes

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 and SPECfp 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.