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

SPECfp®2006 = 92.4
SPECfp_base2006 = 88.5

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

CPU Name: Intel Xeon E5-2650L v3
CPU Characteristics: Intel Turbo Boost Technology up to 2.50 GHz
CPU MHz: 1800
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

Hardware

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: xfs

Software

Continued on next page
## SPEC CFP2006 Result

**Hewlett-Packard Company**

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

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Seconds</th>
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<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
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<tr>
<td>410.bwaves</td>
<td>28.2</td>
<td>482</td>
<td>28.4</td>
<td>479</td>
<td>28.4</td>
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<tr>
<td>416.game2k</td>
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<td>743</td>
<td>26.3</td>
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<tr>
<td>433.milc</td>
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<td>55.7</td>
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<td>55.7</td>
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<td>434.zeusmp</td>
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<td>50.2</td>
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<td>181</td>
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<td>435.gromacs</td>
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<td>39.7</td>
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<td>444.namd</td>
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<td>39.7</td>
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<td>459.GemsFDTD</td>
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<td>30.2</td>
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<td>481.wrf</td>
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<td>56.8</td>
<td>345</td>
<td>56.5</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/transparent_hugepage/enabled`

### Platform Notes

BIOS Configuration:  
- HP Power Profile set to Custom  
- HP Power Regulator 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  
- QPI Snoop Configuration set to Home Snoop  
- Thermal Configuration set to Maximum Cooling  
- Collaborative Power Control set to Disabled

Continued on next page

Standard Performance Evaluation Corporation  
info@spec.org  
http://www.spec.org/
**SPEC CFP2006 Result**

**Hewlett-Packard Company**
ProLiant BL460c Gen9  
(1.80 GHz, Intel Xeon E5-2650L v3)

| SPECfp2006 | 92.4 |
| SPECfp_base2006 | 88.5 |

**CPU2006 license:** 3  
**Test sponsor:** Hewlett-Packard Company  
**Test date:** Dec-2014  
**Tested by:** Hewlett-Packard Company

**Platform Notes (Continued)**

- Processor Power and Utilization Monitoring set to Disabled
- Memory Double Refresh Rate set to 1x Refresh
- Intel Hyperthreading Options set to Disabled
- Sysinfo program /cpu2006/config/sysinfo.rev6914
- $Rev: 6914 $ $Date:: 2014-06-25 #$ e3fbb8667b5a285932ceab81e28219e1
- running on W-b1460c_gen9-VP2.1 Fri Dec 19 12:20:50 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)  
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`

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 W-b1460c_gen9-VP2.1 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 19 12:13

SPEC is set to: /cpu2006

<table>
<thead>
<tr>
<th>Filesystem</th>
<th>Type</th>
<th>Size</th>
<th>Used</th>
<th>Avail</th>
<th>Use%</th>
<th>Mounted on</th>
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</thead>
<tbody>
<tr>
<td>/dev/sda4</td>
<td>xfs</td>
<td>277G</td>
<td>96G</td>
<td>182G</td>
<td>35%</td>
<td>/</td>
</tr>
</tbody>
</table>

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

SPECfp2006 = 92.4
SPECfp_base2006 = 88.5

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

Platform Notes (Continued)

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:
16x 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:
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:
icc   -m64

C++ benchmarks:
icpc  -m64

Fortran benchmarks:
ifort -m64

Benchmarks using both Fortran and C:
icc   -m64 ifort -m64

Base Portability Flags

410.bwaves: -DSPEC_CPU_LP64
416.gamess: -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
Hewlett-Packard Company
ProLiant BL460c Gen9
(1.80 GHz, Intel Xeon E5-2650L v3)

SPECfp2006 = 92.4
SPECfp_base2006 = 88.5

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

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

SPEC CFP2006 Result  

SPECfp2006 =  92.4  
SPECfp_base2006 =  88.5  

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  

Peak Portability Flags

Same as Base Portability Flags

Peak Optimization Flags

C benchmarks:

433.milc: -xCORE-AVX2(pass 2) -prof-gen(p) -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

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SPEC CFP2006 Result

Hewlett-Packard Company

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

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

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For other inquiries, please contact webmaster@spec.org.

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