**Hewlett-Packard Company**

ProLiant BL460c Gen9  
(2.40 GHz, Intel Xeon E5-2620 v3)

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

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>SPECfp®2006</th>
<th>SPECfp_base2006</th>
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<tr>
<td>bwaves</td>
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<tr>
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<td>namd</td>
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<td>dealII</td>
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</table>

**SPECfp®2006 = 98.8**  
**SPECfp_base2006 = 94.2**

**Hardware**

- **CPU Name:** Intel Xeon E5-2620 v3  
- **CPU Characteristics:** Intel Turbo Boost Technology up to 3.20 GHz  
- **CPU MHz:** 2400  
- **FPU:** Integrated  
- **CPU(s) enabled:** 12 cores, 2 chips, 6 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)  
- **Kernel:** 3.10.0-123.el7.x86_64  
- **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

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### Hewlett-Packard Company

ProLiant BL460c Gen9
(2.40 GHz, Intel Xeon E5-2620 v3)

<table>
<thead>
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<tr>
<td>L3 Cache:</td>
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<tr>
<td>Other Cache:</td>
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<tr>
<td>Memory:</td>
<td>256 GB (16 x 16 GB 2Rx4 PC4-2133P-R, running at 1866 MHz)</td>
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<td>Disk Subsystem:</td>
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<td>System State:</td>
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### Results Table

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<td>278</td>
<td>70.1</td>
</tr>
</tbody>
</table>

### 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

Continued on next page
**SPEC CFP2006 Result**

**Hewlett-Packard Company**  
ProLiant BL460c Gen9  
(2.40 GHz, Intel Xeon E5-2620 v3)

**SPECfp2006 =** 98.8  
**SPECfp_base2006 =** 94.2

**CPU2006 license:** 3  
**Test date:** Nov-2014  
**Test sponsor:** Hewlett-Packard Company  
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**Platform Notes (Continued)**

Collaborative Power Control set to Disabled  
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 A-BL460cGen9-VP2 Thu Nov 13 15:45:33 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 E5-2620 v3 @ 2.40GHz  
2 "physical id"s (chips)  
12 "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 : 6  
siblings : 6  
physical 0: cores 0 1 2 3 4 5  
physical 1: cores 0 1 2 3 4 5  
cache size : 15360 KB

From /proc/meminfo  
MemTotal: 263846716 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 A-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 Nov 13 15:40

SPEC is set to: /cpu2006  
Filesystem Type Size Used Avail Use% Mounted on

Continued on next page
Platform Notes (Continued)

/dev/mapper/rhel-root ext4 310G 116G 179G 40% /
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 752369-081 16 GB 2 rank 2133 MHz, configured at 1866 MHz

(End of data from sysinfo program)

Regarding the sysinfo display about the memory installed, the correct amount of
memory is 256 GB and the dmidecode description should have one line reading as:
16x HP 752369-081 16 GB 2 rank 2133 MHz, configured at 1866 MHz

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 = "12"

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

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Hewlett-Packard Company

ProLiant BL460c Gen9 (2.40 GHz, Intel Xeon E5-2620 v3)

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SPECfp_base2006 = 94.2

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

Base Portability Flags (Continued)

434.zeusmp: -DSPEC_CPU_LP64
435.gromacs: -DSPEC_CPU_LP64 -nofor_main
436.cactusADM: -DSPEC_CPU_LP64 -nofor_main
437.leslie3d: -DSPEC_CPU_LP64
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
463.tonto: -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
(2.40 GHz, Intel Xeon E5-2620 v3)

SPEC CFP2006 Result

SPECfp2006 = 98.8
SPECfp_base2006 = 94.2

CPU2006 license: 3
Test sponsor: Hewlett-Packard Company
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Test date: Nov-2014
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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)
-03(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)
-03(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)
-03(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)
-03(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)
-03(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)
-03(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  
(2.40 GHz, Intel Xeon E5-2620 v3)

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**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/Intel-ic15.0-official-linux64.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/Intel-ic15.0-official-linux64.xml)
- [http://www.spec.org/cpu2006/flags/HP-Platform-Flags-Intel-V1.2-HSW-revE.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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