Hewlett-Packard Company

**ProLiant BL460c Gen9**
(2.30 GHz, Intel Xeon E5-2699 v3)

<table>
<thead>
<tr>
<th>Hardware</th>
<th>Software</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU Name: Intel Xeon E5-2699 v3</td>
<td>Operating System: Red Hat Enterprise Linux Server release 7.0 (Maipo)</td>
</tr>
<tr>
<td>CPU Characteristics: Intel Turbo Boost Technology up to 3.60 GHz</td>
<td>Kernel 3.10.0-123.el7.x86_64</td>
</tr>
<tr>
<td>CPU MHz: 2300</td>
<td>C/C++: Version 15.0.0.090 of Intel C++ Studio XE</td>
</tr>
<tr>
<td>FPU: Integrated</td>
<td>for Linux;</td>
</tr>
<tr>
<td>CPU(s) enabled: 18 cores, 1 chip, 18 cores/chip, 2 threads/core</td>
<td>Fortran: Version 15.0.0.090 of Intel Fortran</td>
</tr>
<tr>
<td>CPU(s) orderable: 1 chip</td>
<td>Studio XE for Linux</td>
</tr>
<tr>
<td>Primary Cache: 32 KB I + 32 KB D on chip per core</td>
<td>Auto Parallel: No</td>
</tr>
<tr>
<td>Secondary Cache: 256 KB I+D on chip per core</td>
<td>File System: xfs</td>
</tr>
<tr>
<td>L3 Cache: 45 MB I+D on chip per chip</td>
<td>System State: Run level 3 (multi-user)</td>
</tr>
<tr>
<td>Other Cache: None</td>
<td>Base Pointers: 32/64-bit</td>
</tr>
<tr>
<td>Memory: 128 GB (8 x 16 GB 2Rx4 PC4-2133P-R)</td>
<td>Peak Pointers: 32/64-bit</td>
</tr>
<tr>
<td>Disk Subsystem: 1 x 400 GB SAS SSD 4.240 TD 0</td>
<td>Other Software: None</td>
</tr>
<tr>
<td>Other Hardware: None</td>
<td></td>
</tr>
</tbody>
</table>

**SPECfp®_rate2006 = NC**
**SPECfp_rate_base2006 = NC**

Test date: Feb-2015
Hardware Availability: Sep-2014
Software Availability: Jun-2014

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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.
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---

Operating System Notes

Stack size set to unlimited using "ulimit -s unlimited"

```
echo always > /sys/kernel/mm/transparent_hugepage/enabled
```

Filesystem page cache cleared with:

```
echo 1 > /proc/sys/vm/drop_caches
```

runcspec command invoked through numactl i.e.

```
umactl --interleave=all runcspec <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 Package C-State set to No Package State
- Energy/Performance Bias set to Maximum Performance
- QPI Snoop Configuration set to Cluster on Die
- Thermal Configuration set to Maximum Cooling
- Processor Power & 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 f-b14602-gen9-VP2.1 Tue Feb 3 02:35:32 2015
```

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 E5-2699 v3 @ 2.30GHz
3 "physical id"s (chips)
5 "processors"
core(s), siblings (Caution: counting these is hw and system dependent. The following excerpts from /proc/cpuinfo might not be reliable. Use with caution.)
cpu cores : 9
siblings : 18
physical 0: cores 0 1 2 3 4 8 9 10 11 16 17 18 19 20 24 25 26 27
cache size : 23040 KB
```

---

Non-Compliant
SPEC CFP2006 Result

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Platform Notes (Continued)

From /proc/meminfo
MemTotal:       131731588 kB
HugePages_Total:       0
Hugepagesize:       2048 kB

From /etc/*release*/etc/*version*
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 X-bl460c_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 Feb 2 14:27

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:
4x HP 752369-081 16 GB 2 rank 2133 MHz
4x HP NOT AVAILABLE 16 GB 2 rank 2133 MHz
Hewlett-Packard Company
ProLiant BL460c Gen9
(2.30 GHz, Intel Xeon E5-2699 v3)

SPECfp_rate2006 = NC
SPECfp_rate_base2006 = NC

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

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Platform Notes (Continued)

8x UNKNOWN NOT AVAILABLE

(End of data from sysinfo program) Regarding the sysinfo display about the memory installed, the correct amount of memory is 128 GB and the dmidecode description should have two lines reading as:

□4x HP 752369-081 16 GB 2 rank 2133 MHz
4x HP NOT AVAILABLE 16 GB 2 rank 2133 MHz

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 7.0

Base Compiler Invocation

C benchmarks:
icc   -m64
C++ benchmarks: icpc   -m64
ifort -m64

Benchmark's using both Fortran and C:
icce   -m64 ifort -m64

Base Portability Flags

410.bwaves: -DSPEC_CPU_LP64

Continued on next page
## SPEC CFP2006 Result

**Hewlett-Packard Company**

ProLiant BL460c Gen9 (2.30 GHz, Intel Xeon E5-2699 v3)

<table>
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**CPU2006 license:** 3  
**Test sponsor:** Hewlett-Packard Company  
**Tested by:** Hewlett-Packard Company

**Test date:** Feb-2015  
**Hardware Availability:** Sep-2014  
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<tr>
<td>416.gamess</td>
<td>-DSPEC_CPU_LP64</td>
</tr>
<tr>
<td>433.milc</td>
<td>-DSPEC_CPU_LP64</td>
</tr>
<tr>
<td>434.zeusmp</td>
<td>-DSPEC_CPU_LP64</td>
</tr>
<tr>
<td>435.gromacs</td>
<td>-DSPEC_CPU_LP64 -nofor_main</td>
</tr>
<tr>
<td>436.cactusADM</td>
<td>-DSPEC_CPU_LP64 -nofor_main</td>
</tr>
<tr>
<td>437.leslie3d</td>
<td>-DSPEC_CPU_LP64</td>
</tr>
<tr>
<td>444.namd</td>
<td>-DSPEC_CPU_LP64</td>
</tr>
<tr>
<td>447.dealII</td>
<td>-DSPEC_CPU_LP64</td>
</tr>
<tr>
<td>450.soplex</td>
<td>-DSPEC_CPU_LP64</td>
</tr>
<tr>
<td>453.povray</td>
<td>-DSPEC_CPU_LP64 -nofor_main</td>
</tr>
<tr>
<td>454.calculix</td>
<td>-DSPEC_CPU_LP64</td>
</tr>
<tr>
<td>459.GemsFDTD</td>
<td>-DSPEC_CPU_LP64 -nofor_main</td>
</tr>
<tr>
<td>465.tonto</td>
<td>-DSPEC_CPU_LP64</td>
</tr>
<tr>
<td>470.lbm</td>
<td>-DSPEC_CPU_LP64</td>
</tr>
<tr>
<td>481.wrf</td>
<td>-DSPEC_CPU_LP64 -DSPEC_CPU_CASE_FLAG -DSPEC_CPU_LINUX</td>
</tr>
<tr>
<td>482.sphinx3</td>
<td>-DSPEC_CPU_LP64 -nofor_main</td>
</tr>
</tbody>
</table>

### Base Optimization Flags

**C benchmarks:**
- **-xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch -auto-p32**
- **-ansi-alias -opt-mem-layout-trans=3**

**Fortran benchmarks:**
- **-xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch**
- **-ansi-alias -opt-mem-layout-trans=3**

**Benchmarks using both Fortran and C:**
- **-xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch -auto-p32**
- **-ansi-alias -opt-mem-layout-trans=3**
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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)
-opt-mem-layout-trans=3(pass 2) -prof-use(pass 2)
-auto-ilp32

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)
-opt-mem-layout-trans=3(pass 2) -prof-use(pass 2) -fno-alias
-auto-ilp32

447.dealII: basepeak = yes

450.soplex: -xCORE-AVX2(pass 2) -prof-gen(pass 1) -ipo(pass 2)
-03(pass 2) -no-prec-div(pass 2)
-opt-mem-layout-trans=3(pass 2) -prof-use(pass 2)
-opt-malloc-options=3

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) -unroll4
-ansi-alias

Continued on next page
SPEC CFP2006 Result

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| SPECfp_rate2006 = | NC |
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Peak Optimization Flags (Continued)

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<tr>
<td>434.zeusmp</td>
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<tr>
<td>437.leslie3d</td>
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</tr>
<tr>
<td>459.GemsFDTD</td>
<td>basepeak = yes</td>
</tr>
<tr>
<td>465.tonto</td>
<td>-xCORE-AVX2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -03(pass 2) -no-prec-div(pass 2) -prof-use(pass 2) -unroll4 -auto -inline-calloc -opt-malloc-options=3</td>
</tr>
<tr>
<td>435.gromacs</td>
<td>-xCORE-AVX2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -03(pass 2) -no-prec-div(pass 2) -opt-mem-layout-trans=3(pass 2) -prof-use(pass 2) -opt-prefetch -auto-ilp32</td>
</tr>
<tr>
<td>436.cactusADM</td>
<td>basepeak = yes</td>
</tr>
<tr>
<td>454.calculix</td>
<td>basepeak = yes</td>
</tr>
<tr>
<td>481.wrf</td>
<td>-xCORE-AVX2 -ipo -O3 -no-prec-div -opt-malloc-options=3</td>
</tr>
</tbody>
</table>

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 questions about this result, please contact the tester.
For other inquiries, please contact webmaster@spec.org.

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