Hewlett Packard Enterprise
ProLiant BL460c Gen9
(2.20 GHz, Intel Xeon E5-2630 v4)

SPECfp®2006 = 110
SPECfp_base2006 = 104

CPU2006 license: 3
Test sponsor: HPE
Tested by: HPE

Hardware
CPU Name: Intel Xeon E5-2630 v4
CPU Characteristics: Intel Turbo Boost Technology up to 3.10 GHz
CPU MHz: 2200
FPU: Integrated
CPU(s) enabled: 20 cores, 2 chips, 10 cores/chip, 2 threads/core
CPU(s) orderable: 1.2 chip
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: SuSE Linux Enterprise Server 12 (x86_64) SP 1
Compiler: C/C++: Version 16.0.0.101 of Intel C++ Studio XE for Linux;
          Fortran: Version 16.0.0.101 of Intel Fortran Studio XE for Linux
Auto Parallel: Yes
File System: xfs
System State: Run level 5 (multi-user, w/GUI)
### SPEC CFP2006 Result

**Hewlett Packard Enterprise**  
(Test Sponsor: HPE)  
ProLiant BL460c Gen9  
(2.20 GHz, Intel Xeon E5-2630 v4)  

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<td>294</td>
<td>66.3</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:
  - Intel Hyperthreading Option set to Enabled
  - Power Profile set to Custom
  - Power Regulator set to Static High Performance Mode
  - Minimum Processor Idle Power Core C-State set to C1E State
  - Minimum Processor Idle Power Package C-State set to No Package State
  - Collaborative Power Control set to Disabled

Continued on next page
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 /home/cpuv1.5/cpu2006/config/sysinfo.rev6914
$Rev: 6914 $ $Date:: 2014-06-25 #$ e3fbb8667b5a285932ceab81e28219e1
running on bl460c2-gen9-b Mon May 23 09:17:19 2016

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 E5-2630 v4 @ 2.20GHz
  2 "physical id"s (chips)
  40 "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 : 10
siblings : 20
physical 0: cores 0 1 2 3 4 8 9 10 11 12
physical 1: cores 0 1 2 3 4 8 9 10 11 12
cache size : 25600 KB

From /proc/meminfo
MemTotal: 264326864 kB
HugePages_Total: 0
Hugepagesize: 2048 kB

/usr/bin/lsb_release -d
  SUSE Linux Enterprise Server 12 SP1

From /etc/*release*/etc/*version*
SuSE-release:
  SUSE Linux Enterprise Server 12 (x86_64)
  VERSION = 12
  PATCHLEVEL = 1
  # This file is deprecated and will be removed in a future service pack or
  release.
  # Please check /etc/os-release for details about this release.
os-release:
  NAME="SLES"
  VERSION="12-SP1"
  VERSION_ID="12.1"
  PRETTY_NAME="SUSE Linux Enterprise Server 12 SP1"
  ID="sles"
  ANSI_COLOR="0;32"
  CPE_NAME="cpe:/o:suse:sles:12:sp1"

uname -a:
Continued on next page
Hewlett Packard Enterprise
(Test Sponsor: HPE)
ProLiant BL460c Gen9
(2.20 GHz, Intel Xeon E5-2630 v4)

SPECfp2006 = 110
SPECfp_base2006 = 104

CPU2006 license: 3
Test sponsor: HPE
Tested by: HPE

Test date: May-2016
Hardware Availability: Mar-2016
Software Availability: Dec-2015

Platform Notes (Continued)

(8d714a0) x86_64 x86_64 x86_64 GNU/Linux

run-level 5 May 23 08:56

SPEC is set to: /home/cpuv1.5/cpu2006
Filesystem Type Size Used Avail Use% Mounted on
/dev/sda4 xfs 424G 176G 248G 42% /home

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 04/12/2016
Memory:
8x UNKNOWN NOT AVAILABLE
8x UNKNOWN NOT AVAILABLE 32 GB 2 rank 2400 MHz, configured at 2133 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:
8x UNKNOWN NOT AVAILABLE 32 GB 2 rank 2400 MHz, configured at 2133 MHz

General Notes

Environment variables set by runspec before the start of the run:
KMP_AFFINITY = "granularity=fine,compact,1,0"
LD_LIBRARY_PATH = "/home/cpuv1.5/cpu2006/libs/32:/home/cpuv1.5/cpu2006/libs/64:/home/cpuv1.5/cpu2006/sh"
OMP_NUM_THREADS = "20"

Binaries compiled on a system with 1x Intel Core i5-4670K CPU + 32GB
memory using RedHat EL 7.1

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
SPEC CFP2006 Result

**Hewlett Packard Enterprise**
(Test Sponsor: HPE)
ProLiant BL460c Gen9
(2.20 GHz, Intel Xeon E5-2630 v4)

<table>
<thead>
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<tr>
<td>SPECfp_base2006</td>
<td>104</td>
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</table>

**CPU2006 license:** 3  
**Test sponsor:** HPE  
**Tested by:** HPEx  
**Test date:** May-2016  
**Hardware Availability:** Mar-2016  
**Software Availability:** Dec-2015

### 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  
- **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

Continued on next page
Hewlett Packard Enterprise
ProLiant BL460c Gen9
(2.20 GHz, Intel Xeon E5-2630 v4)

CPU2006 license: 3
Test sponsor: HPE
Tested by: HPE

SPECfp2006 = 110
SPECfp_base2006 = 104

Test date: May-2016
Hardware Availability: Mar-2016
Software Availability: Dec-2015

Peak Compiler Invocation (Continued)

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: basepeak = yes
470.lbm: basepeak = yes
482.sphinx3: basepeak = yes
```

C++ benchmarks:

```
444.namd: -xCORE-AVX2(pass 2) -prof-gen:threadsafe(pass 1)
           -ipo(pass 2) -03(pass 2) -no-prec-div(pass 2)
           -par-num-threads=1(pass 1) -prof-use(pass 2) -fno-alias
           -auto-ilp32
447.dealII: basepeak = yes
450.soplex: basepeak = yes
453.povray: -xCORE-AVX2(pass 2) -prof-gen:threadsafe(pass 1)
            -ipo(pass 2) -03(pass 2) -no-prec-div(pass 2)
            -par-num-threads=1(pass 1) -prof-use(pass 2) -unroll4
            -ansi-alias
```

Fortran benchmarks:

```
410.bwaves: basepeak = yes
416.gamess: -xCORE-AVX2(pass 2) -prof-gen:threadsafe(pass 1)
              -ipo(pass 2) -03(pass 2) -no-prec-div(pass 2)
              -par-num-threads=1(pass 1) -prof-use(pass 2) -unroll2
              -inline-level=0 -scalar-rep-
434.zeusmp: basepeak = yes
437.leslie3d: basepeak = yes
```

Continued on next page
Hewlett Packard Enterprise
(Test Sponsor: HPE)
ProLiant BL460c Gen9
(2.20 GHz, Intel Xeon E5-2630 v4)

SPECfp2006 = 110
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CPU2006 license: 3
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Test date: May-2016
Hardware Availability: Mar-2016
Software Availability: Dec-2015

Peak Optimization Flags (Continued)

459.GemsFDTD: -xCORE-AVX2(pass 2) -prof-gen:threadsafety(pass 1)
-ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2)
-par-num-threads=1(pass 1) -prof-use(pass 2) -unroll2
-inline-level=0 -opt-prefetch -parallel

465.tonto: -xCORE-AVX2(pass 2) -prof-gen:threadsafety(pass 1)
-ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2)
-par-num-threads=1(pass 1) -prof-use(pass 2) -inline-calloc
-opt-malloc-options=3 -auto -unroll4

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/HP-Platform-Flags-Intel-V1.2-HSW-revE.html
http://www.spec.org/cpu2006/flags/Intel-ic16.0-official-linux64.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-HSW-revE.xml
http://www.spec.org/cpu2006/flags/Intel-ic16.0-official-linux64.xml

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

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