SPEC® CFP2006 Result
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Hewlett-Packard Company

ProLiant BL460c Gen8
(2.40 GHz, Intel Xeon E5-2609)

$SPECfp^{®}2006 =$ 59.5

$SPECfp\_base2006 =$ 57.2

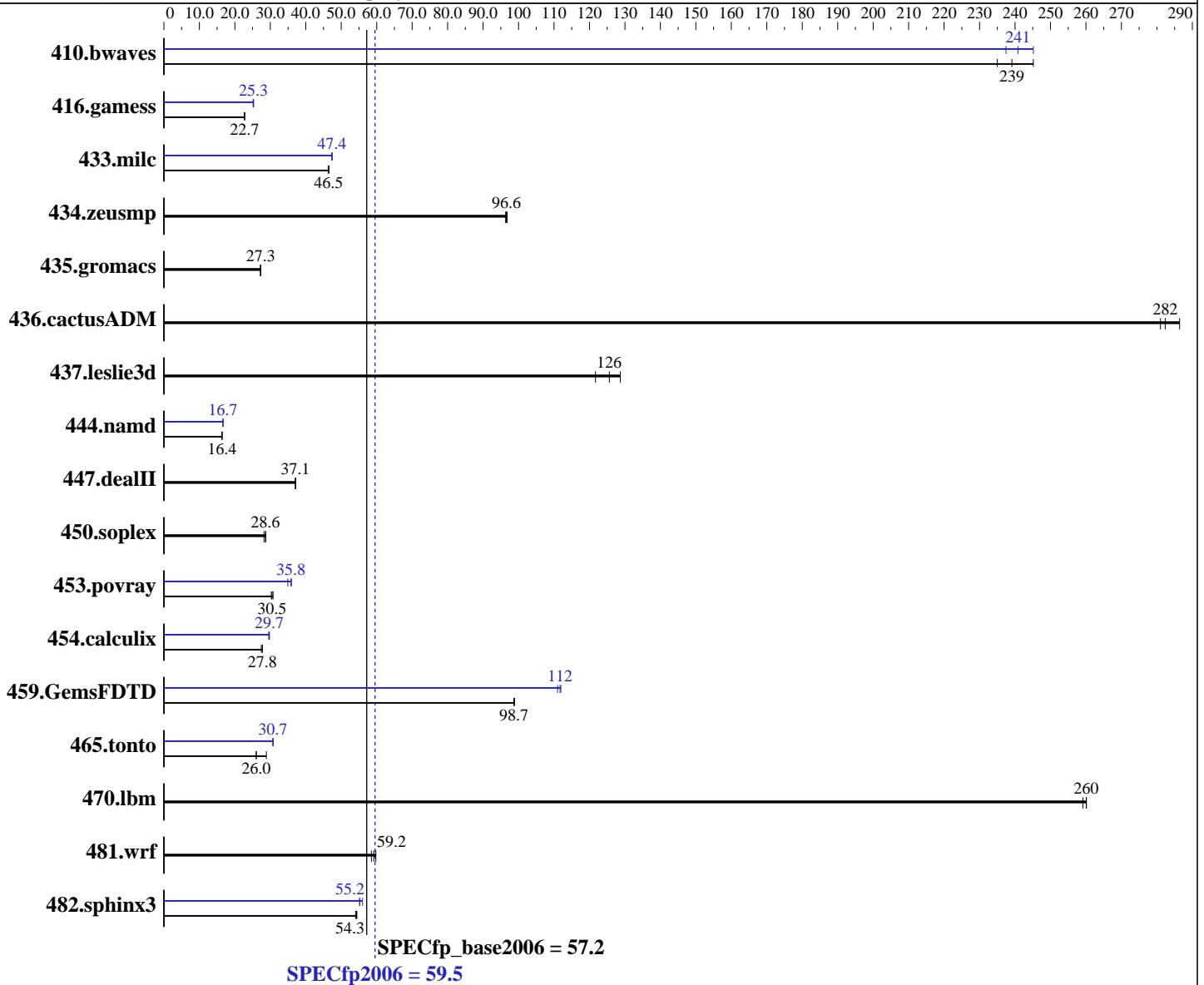|	
CPU2006 license: 3	**Test date:** Aug-2012
Test sponsor: Hewlett-Packard Company	**Hardware Availability:** Jun-2012
Tested by: Hewlett-Packard Company	**Software Availability:** Mar-2012

Benchmark	Result
410.bwaves	241 / 239
416.gamess	25.3 / 22.7
433.milc	47.4 / 46.5
434.zeusmp	96.6
435.gromacs	27.3
436.cactusADM	282
437.leslie3d	126
444.namd	16.7 / 16.4
447.dealII	37.1
450.soplex	28.6
453.povray	35.8 / 30.5
454.calculix	29.7 / 27.8
459.GemsFDTD	112 / 98.7
465.tonto	30.7 / 26.0
470.lbm	260
481.wrf	59.2
482.sphinx3	55.2 / 54.3

SPECfp_base2006 = 57.2

SPECfp2006 = 59.5

Hardware

CPU Name:	Intel Xeon E5-2609
CPU Characteristics:	
CPU MHz:	2400
FPU:	Integrated
CPU(s) enabled:	8 cores, 2 chips, 4 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

Continued on next page

Software

Operating System:	Red Hat Enterprise Linux Server release 6.2, (Santiago) 2.6.32-220.el6.x86_64
Compiler:	C/C++: Version 12.1.0.225 of Intel C++ Studio XE for Linux; Fortran: Version 12.1.0.225 of Intel Fortran Studio XE for Linux
Auto Parallel:	Yes
File System:	ext4

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L3 Cache:	10 MB I+D on chip per chip
Other Cache:	None
Memory:	128 GB (16 x 8 GB 2Rx4 PC3-12800R-11, ECC, running at 1066 MHz and CL7)
Disk Subsystem:	1 x 146 GB 15 K SAS
Other Hardware:	None

System State:	Run level 3 (multi-user)
Base Pointers:	64-bit
Peak Pointers:	32/64-bit
Other Software:	HP Array Configuration Utility, CLI version

Results Table

Benchmark	Base Seconds	Base Ratio	Base Seconds	Base Ratio	Base Seconds	Base Ratio	Peak Seconds	Peak Ratio	Peak Seconds	Peak Ratio	Peak Seconds	Peak Ratio
410.bwaves	57.8	235	**56.8**	**239**	55.4	245	57.2	237	55.4	245	**56.4**	**241**
416.gamess	**861**	**22.7**	865	22.6	859	22.8	775	25.3	**775**	**25.3**	779	25.1
433.milc	**198**	**46.5**	198	46.5	198	46.4	**194**	**47.4**	194	47.4	194	47.3
434.zeusmp	94.0	96.8	94.4	96.4	**94.2**	**96.6**	94.0	96.8	94.4	96.4	**94.2**	**96.6**
435.gromacs	262	27.2	**262**	**27.3**	262	27.3	262	27.2	**262**	**27.3**	262	27.3
436.cactusADM	41.7	286	42.5	281	**42.3**	**282**	41.7	286	42.5	281	**42.3**	**282**
437.leslie3d	**74.8**	**126**	77.2	122	73.0	129	**74.8**	**126**	77.2	122	73.0	129
444.namd	**489**	**16.4**	489	16.4	489	16.4	**481**	**16.7**	481	16.7	481	16.7
447.dealII	**308**	**37.1**	309	37.0	308	37.2	**308**	**37.1**	309	37.0	308	37.2
450.soplex	290	28.7	295	28.2	**291**	**28.6**	290	28.7	295	28.2	**291**	**28.6**
453.povray	173	30.8	176	30.3	**174**	**30.5**	**148**	**35.8**	148	36.0	152	34.9
454.calculix	300	27.5	**297**	**27.8**	297	27.8	277	29.7	279	29.6	**278**	**29.7**
459.GemsFDTD	**108**	**98.7**	107	98.9	108	98.7	94.8	112	95.6	111	**95.0**	**112**
465.tonto	341	28.9	**378**	**26.0**	378	26.0	320	30.7	**320**	**30.7**	319	30.8
470.lbm	52.8	260	53.0	259	**52.8**	**260**	52.8	260	53.0	259	**52.8**	**260**
481.wrf	191	58.5	187	59.8	**189**	**59.2**	191	58.5	187	59.8	**189**	**59.2**
482.sphinx3	**359**	**54.3**	358	54.4	361	54.1	348	56.0	**353**	**55.2**	353	55.2

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
Filesystem page cache cleared with:
echo 1 >        /proc/sys/vm/drop_caches
runspec command invoked through numactl i.e.:
numactl --localalloc runspec <etc>
Drive Write Cache set to Enabled in HP Array Configuration Utility,
 CLI version
Accelerator Ratio for Reads/Writes set to = 100% Read / 0% Write
 in HP Array Configuration Utility, CLI version
```

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Test date: Aug-2012
Hardware Availability: Jun-2012
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Platform Notes

```
BIOS Configuration:
 HP Power Profile set to Custom
 Energy/Performance Bias is set to Maximum Performance
 Thermal Configuration set to Maximum Cooling
 Collaborative Power Control set to Disabled
 Processor Power and Utilization Monitoring set to Disabled

Sysinfo program /cpu2006/config/sysinfo.rev6800
$Rev: 6800 $ $Date:: 2011-10-11 #$ 6f2ebdff5032aaa42e583f96b07f99d3
running on BL460cGen8-1 Wed Aug 15 00:58:35 2012

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 E5-2609 0 @ 2.40GHz
      2 "physical id"s (chips)
      8 "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 : 4
      siblings  : 4
      physical 0: cores 0 1 2 3
      physical 1: cores 0 1 2 3
   cache size : 10240 KB

From /proc/meminfo
   MemTotal:       132120004 kB
   HugePages_Total:        0
   Hugepagesize:        2048 kB

/usr/bin/lsb_release -d
   Red Hat Enterprise Linux Server release 6.2 (Santiago)

From /etc/*release* /etc/*version*
   redhat-release: Red Hat Enterprise Linux Server release 6.2 (Santiago)
   system-release: Red Hat Enterprise Linux Server release 6.2 (Santiago)
   system-release-cpe: cpe:/o:redhat:enterprise_linux:6server:ga:server

uname -a:
   Linux BL460cGen8-1 2.6.32-220.el6.x86_64 #1 SMP Wed Nov 9 08:03:13 EST 2011
   x86_64 x86_64 x86_64 GNU/Linux

run-level 3 Aug 14 16:41

SPEC is set to: /cpu2006
   Filesystem    Type    Size  Used Avail Use% Mounted on
   /dev/sda3     ext4    133G   20G  107G  16% /

Additional information from dmidecode:
```
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Platform Notes (Continued)

```
      BIOS HP I31 05/30/2012
      Memory:
       16x HP Not Specified 8 GB 1600 MHz 2 rank

    (End of data from sysinfo program)
```

General Notes

```
Environment variables set by runspec before the start of the run:
KMP_AFFINITY = "granularity=fine,scatter"
LD_LIBRARY_PATH = "/cpu2006/libs/32:/cpu2006/libs/64"
OMP_NUM_THREADS = "8"

 Binaries compiled on a system with 1x Core i7-860 CPU + 8GB
 memory using RHEL5.5
```

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
        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
```

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ProLiant BL460c Gen8
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Base Portability Flags (Continued)

```
    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:
```
    -xAVX -ipo -O3 -no-prec-div -static -parallel -opt-prefetch
    -ansi-alias
```

C++ benchmarks:
```
    -xAVX -ipo -O3 -no-prec-div -static -opt-prefetch -ansi-alias
```

Fortran benchmarks:
```
    -xAVX -ipo -O3 -no-prec-div -static -parallel -opt-prefetch
```

Benchmarks using both Fortran and C:
```
    -xAVX -ipo -O3 -no-prec-div -static -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
```

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Peak Optimization Flags

C benchmarks:

  433.milc: -xAVX(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)
        -no-prec-div(pass 2) -prof-use(pass 2) -static -auto-ilp32
        -ansi-alias

  470.lbm: basepeak = yes

  482.sphinx3: -xAVX -ipo -O3 -no-prec-div -unroll2 -ansi-alias
        -parallel

C++ benchmarks:

  444.namd: -xAVX(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: -xAVX(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: -xAVX -ipo -O3 -no-prec-div -opt-prefetch -parallel
        -static

  416.gamess: -xAVX(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- -static

  434.zeusmp: basepeak = yes

  437.leslie3d: basepeak = yes

  459.GemsFDTD: -xAVX(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: -xAVX(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

Benchmarks using both Fortran and C:

  435.gromacs: basepeak = yes

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Peak Optimization Flags (Continued)

436.cactusADM: basepeak = yes

454.calculix: -xAVX -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-ic12.1-official-linux64.20120425.html
http://www.spec.org/cpu2006/flags/HP-Platform-Flags-Intel-V1.2-A.20120829.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2006/flags/Intel-ic12.1-official-linux64.20120425.xml
http://www.spec.org/cpu2006/flags/HP-Platform-Flags-Intel-V1.2-A.20120829.xml

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

Tested with SPEC CPU2006 v1.2.
Report generated on Thu Jul 24 09:15:37 2014 by SPEC CPU2006 PS/PDF formatter v6932.
Originally published on 25 September 2012.