SPEC® CFP2006 Result
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Hewlett-Packard Company

$SPECfp^{®}2006 =$ 58.6

ProLiant BL420c Gen8
(1.90 GHz, Intel Xeon E5-2420)

$SPECfp\_base2006 =$ 56.3

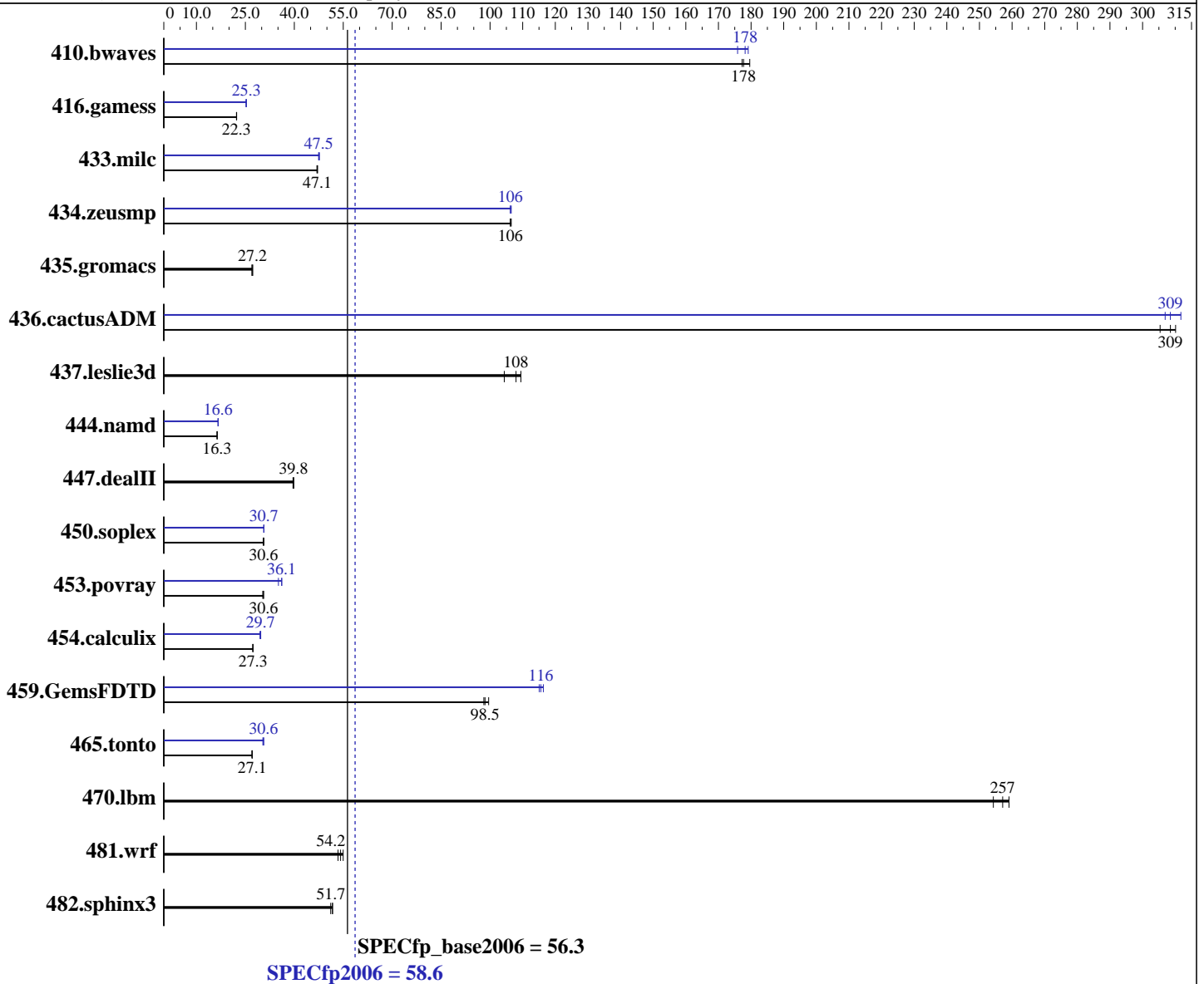|		
CPU2006 license: 3		**Test date:** Jul-2012
Test sponsor: Hewlett-Packard Company		**Hardware Availability:** Jun-2012
Tested by: Hewlett-Packard Company		**Software Availability:** Feb-2012

0 10.0   25.0   40.0   55.0   70.0   85.0   100 110 120 130 140 150 160 170 180 190 200 210 220 230 240 250 260 270 280 290 300 315

- **410.bwaves** — 178 / 178
- **416.gamess** — 25.3 / 22.3
- **433.milc** — 47.5 / 47.1
- **434.zeusmp** — 106 / 106
- **435.gromacs** — 27.2
- **436.cactusADM** — 309 / 309
- **437.leslie3d** — 108
- **444.namd** — 16.6 / 16.3
- **447.dealII** — 39.8
- **450.soplex** — 30.7 / 30.6
- **453.povray** — 36.1 / 30.6
- **454.calculix** — 29.7 / 27.3
- **459.GemsFDTD** — 116 / 98.5
- **465.tonto** — 30.6 / 27.1
- **470.lbm** — 257
- **481.wrf** — 54.2
- **482.sphinx3** — 51.7

SPECfp_base2006 = 56.3

SPECfp2006 = 58.6

Hardware

CPU Name:	Intel Xeon E5-2420
CPU Characteristics:	Intel Turbo Boost Technology up to 2.40 GHz
CPU MHz:	1900
FPU:	Integrated
CPU(s) enabled:	12 cores, 2 chips, 6 cores/chip, 2 threads/core
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 12.1.3.293 of Intel C++ Studio XE for Linux; Fortran: Version 12.1.3.293 of Intel Fortran Studio XE for Linux
Auto Parallel:	Yes
File System:	ext4

Continued on next page

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L3 Cache:	15 MB I+D on chip per chip	System State:	Run level 3 (multi-user)
Other Cache:	None	Base Pointers:	64-bit
Memory:	96 GB (12 x 8 GB 2Rx4 PC3-12800R-11, ECC, running at 1333 MHz and CL9)	Peak Pointers:	64-bit
		Other Software:	None
Disk Subsystem:	2 x 146 GB 15 K SAS, RAID 0		
Other Hardware:	None		

Results Table

Benchmark	Base						Peak					
	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	75.7	180	76.7	177	**76.5**	**178**	**76.3**	**178**	77.3	176	75.9	179
416.gamess	**879**	**22.3**	877	22.3	879	22.3	774	25.3	**774**	**25.3**	777	25.2
433.milc	195	47.1	**195**	**47.1**	196	46.9	**193**	**47.5**	193	47.5	192	47.7
434.zeusmp	85.7	106	**85.7**	**106**	85.5	106	**85.7**	**106**	85.7	106	85.5	106
435.gromacs	262	27.2	**262**	**27.2**	265	27.0	262	27.2	**262**	**27.2**	265	27.0
436.cactusADM	**38.7**	**309**	39.1	305	38.5	310	38.3	312	38.9	307	**38.7**	**309**
437.leslie3d	90.1	104	85.9	109	**87.1**	**108**	90.1	104	85.9	109	**87.1**	**108**
444.namd	491	16.3	490	16.4	**491**	**16.3**	**482**	**16.6**	482	16.6	482	16.6
447.dealII	**288**	**39.8**	287	39.8	289	39.6	**288**	**39.8**	287	39.8	289	39.6
450.soplex	272	30.7	**273**	**30.6**	274	30.5	272	30.7	**272**	**30.7**	272	30.6
453.povray	**174**	**30.6**	174	30.6	175	30.3	151	35.1	**147**	**36.1**	147	36.1
454.calculix	**302**	**27.3**	301	27.4	303	27.3	278	29.7	**278**	**29.7**	280	29.5
459.GemsFDTD	**108**	**98.5**	108	98.1	107	99.6	**91.8**	**116**	91.2	116	92.2	115
465.tonto	362	27.2	365	27.0	**363**	**27.1**	**322**	**30.6**	321	30.6	324	30.4
470.lbm	54.0	254	53.0	259	**53.4**	**257**	54.0	254	53.0	259	**53.4**	**257**
481.wrf	203	55.0	**206**	**54.2**	209	53.4	203	55.0	**206**	**54.2**	209	53.4
482.sphinx3	381	51.2	**377**	**51.7**	377	51.7	381	51.2	**377**	**51.7**	377	51.7

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 Maximum Performance
Sysinfo program /mnt/store/cpu2006/Docs/sysinfo
$Rev: 6775 $ $Date:: 2011-08-16 #$ 8787f7622badcf24e01c368b1db4377c
running on bl420c-cpu Tue Jul 17 18:49:17 2012

 This section contains SUT (System Under Test) info as seen by
```

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Platform Notes (Continued)

```
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 E5-2420 0 @ 1.90GHz
      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 : 6
      siblings  : 12
      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:       99026400 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 bl420c-cpu 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 Jul 11 23:26

SPEC is set to: /mnt/store/cpu2006
   Filesystem     Type     Size  Used Avail Use% Mounted on
   /dev/sda5      ext4     191G   14G  168G   8% /mnt/store

(End of data from sysinfo program)
```

General Notes

```
glibc-static-2.12-1.47.el6.x86_64.rpm is added to enable static linking
Environment variables set by runspec before the start of the run:
LD_LIBRARY_PATH = "/opt/smartheap/:/opt/ic12-libs/intel64/"
OMP_NUM_THREADS=12
KMP_AFFINITY="granularity=fine,scatter"
```

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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
        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

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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

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: basepeak = yes

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

    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

Continued on next page

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Peak Optimization Flags (Continued)

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

437.leslie3d: basepeak = yes

459.GemsFDTD: -xSSE4.2(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

436.cactusADM: -xAVX -ipo -O3 -no-prec-div -static -parallel
-opt-prefetch -ansi-alias

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

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