SPEC® CFP2006 Result

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Hewlett-Packard Company

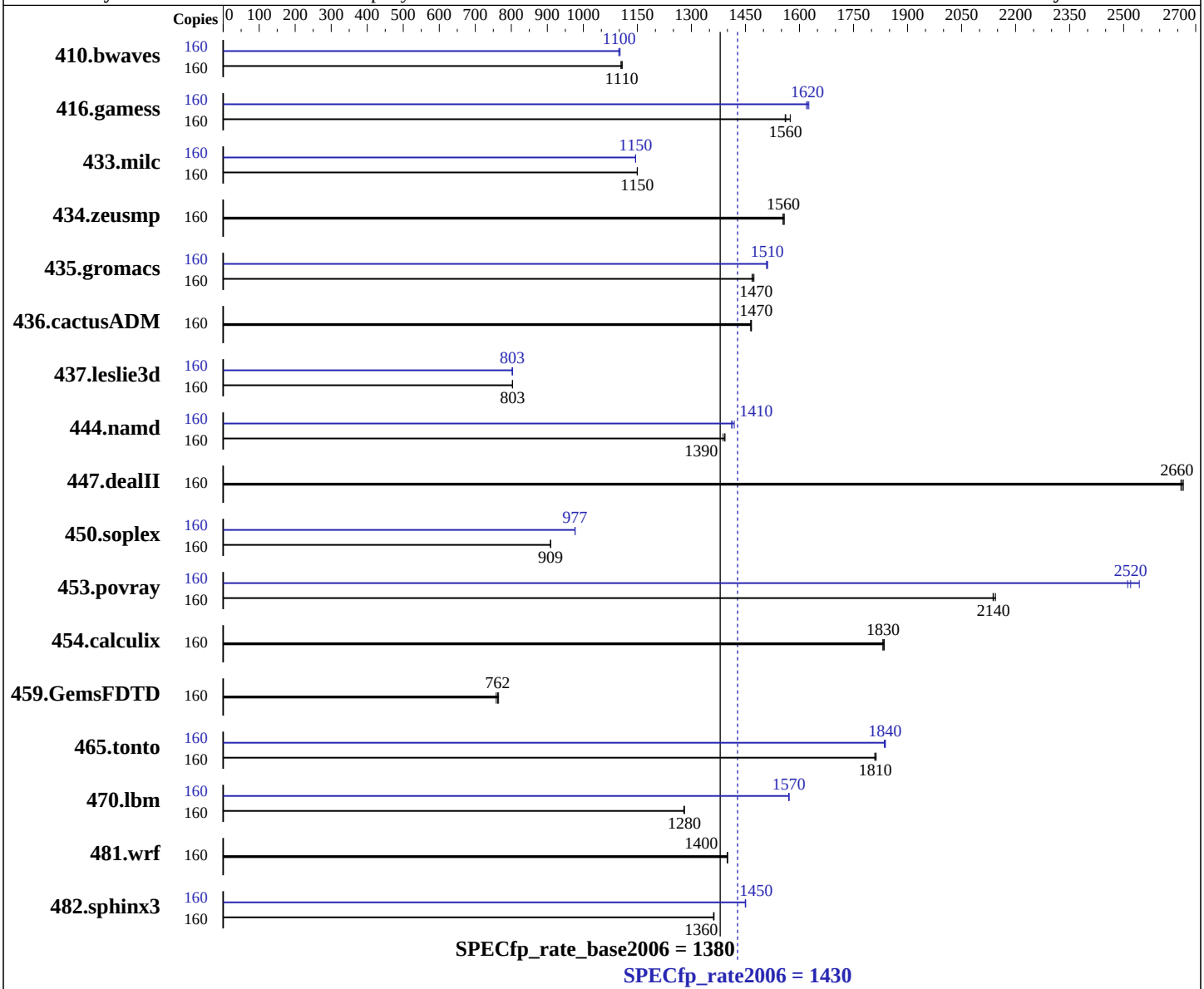
ProLiant DL980 G7 (2.4 GHz, Intel Xeon E7-4870)

SPECfp®_rate2006 = 1430

SPECfp_rate_base2006 = 1380

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

Test date: Sep-2011
Hardware Availability: Aug-2011
Software Availability: Jul-2011



Hardware

CPU Name:	Intel Xeon E7-4870
CPU Characteristics:	Intel Turbo Boost Technology up to 2.8 GHz
CPU MHz:	2400
FPU:	Integrated
CPU(s) enabled:	80 cores, 8 chips, 10 cores/chip, 2 threads/core
CPU(s) orderable:	4, 8 chips
Primary Cache:	32 KB I + 32 KB D on chip per core
Secondary Cache:	256 KB I+D on chip per core

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Software

Operating System:	SUSE Linux Enterprise Server 11 (x86_64) SP1, Kernel 2.6.32.12-0.7-default
Compiler:	C/C++: Version 12.0.5 of Intel C++ Composer XE 2011 for Linux Build 20110719; Fortran: Version 12.0.5 of Intel Fortran Composer XE 2011 for Linux Build 20110719
Auto Parallel:	No
File System:	tmpfs
System State:	Run level 3 (multi-user)

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L3 Cache: 30 MB I+D on chip per chip
Other Cache: None
Memory: 1 TB (128 x 8 GB 2Rx4 PC3L-10600R-9, ECC, running at 1066 MHz)
Disk Subsystem: 1 x 120 GB SATA SSD
Other Hardware: 512 MB FBWC Module for P410i SmartArray

Base Pointers: 64-bit
Peak Pointers: 32/64-bit
Other Software: None

Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	160	1963	1110	1969	1100	**1965**	**1110**	160	**1977**	**1100**	1973	1100	1980	1100
416.gamess	160	**2006**	**1560**	1990	1570	2008	1560	160	**1931**	**1620**	1934	1620	1927	1630
433.milc	160	1278	1150	**1278**	**1150**	1277	1150	160	**1283**	**1150**	1283	1150	1283	1140
434.zeusmp	160	935	1560	937	1550	**936**	**1560**	160	935	1560	937	1550	**936**	**1560**
435.gromacs	160	**776**	**1470**	778	1470	775	1470	160	756	1510	757	1510	**756**	**1510**
436.cactusADM	160	1303	1470	**1304**	**1470**	1306	1460	160	1303	1470	**1304**	**1470**	1306	1460
437.leslie3d	160	1873	803	1872	803	**1872**	**803**	160	1871	804	1874	803	**1874**	**803**
444.namd	160	921	1390	924	1390	**921**	**1390**	160	**909**	**1410**	909	1410	904	1420
447.dealII	160	**687**	**2660**	687	2670	688	2660	160	**687**	**2660**	687	2670	688	2660
450.soplex	160	**1468**	**909**	1468	909	1467	909	160	1366	977	1366	977	**1366**	**977**
453.povray	160	**398**	**2140**	397	2140	398	2140	160	335	2540	339	2510	**338**	**2520**
454.calculix	160	**720**	**1830**	719	1840	721	1830	160	**720**	**1830**	719	1840	721	1830
459.GemsFDTD	160	2220	765	2239	758	**2228**	**762**	160	2220	765	2239	758	**2228**	**762**
465.tonto	160	868	1810	**869**	**1810**	870	1810	160	856	1840	**857**	**1840**	858	1840
470.lbm	160	**1717**	**1280**	1719	1280	1717	1280	160	**1399**	**1570**	1400	1570	1399	1570
481.wrf	160	1276	1400	1277	1400	**1277**	**1400**	160	1276	1400	1277	1400	**1277**	**1400**
482.sphinx3	160	2291	1360	**2289**	**1360**	2288	1360	160	**2150**	**1450**	2150	1450	2151	1450

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

Submit Notes

```
The config file option 'submit' was used.
 numactl was used to bind copies to the cores
```

Operating System Notes

```
I/O scheduler for the device holding the filesystem set to "noop"
SPEC files placed in /dev/shm/cpu2006 with /dev/shm
mounted as tmpfs with mpol=interleave, size=500G
'ulimit -s unlimited' was used to set the stacksize to unlimited prior to run
Hugepages were not configured on the system
```

Platform Notes

```
BIOS Settings:
Power Regulator set to HP Static High Performance Mode
Sysinfo program /dev/shm/cpu2006/Docs/sysinfo
$Rev: 6775 $ $Date:: 2011-08-16 #$ 8787f7622badcf24e01c368b1db4377c
running on s9 Fri Sep  9 19:19:07 2011

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 E7- 4870 @ 2.40GHz
      8 "physical id"s (chips)
      160 "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 5 6 7 8 9
      physical 1: cores 0 1 2 3 4 5 6 7 8 9
      physical 2: cores 0 1 2 3 4 5 6 7 8 9
      physical 3: cores 0 1 2 3 4 5 6 7 8 9
      physical 4: cores 0 1 2 3 4 5 6 7 8 9
      physical 5: cores 0 1 2 3 4 5 6 7 8 9
      physical 6: cores 0 1 2 3 4 5 6 7 8 9
      physical 7: cores 0 1 2 3 4 5 6 7 8 9
   cache size : 30720 KB

From /proc/meminfo
   MemTotal:       1040205340 kB
   HugePages_Total:       0
   Hugepagesize:       2048 kB

/usr/bin/lsb_release -d
   SUSE Linux Enterprise Server 11 (x86_64)

From /etc/*release* /etc/*version*
   SuSE-release:
      SUSE Linux Enterprise Server 11 (x86_64)
      VERSION = 11
      PATCHLEVEL = 1

uname -a:
   Linux s9 2.6.32.12-0.7-default #1 SMP 2010-05-20 11:14:20 +0200 x86_64 x86_64
   x86_64 GNU/Linux

run-level 3 Sep 9 00:49 last=S

SPEC is set to: /dev/shm/cpu2006
   Filesystem     Type    Size  Used Avail Use% Mounted on
   tmpfs        tmpfs     497G  138G  359G  28% /dev/shm
```

Continued on next page

Platform Notes (Continued)

```
(End of data from sysinfo program)
```

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:
```
-xSSE4.2 -ipo -O3 -no-prec-div -static -ansi-alias
```

C++ benchmarks:
```
-xSSE4.2 -ipo -O3 -no-prec-div -static -ansi-alias
```

Continued on next page

Base Optimization Flags (Continued)

Fortran benchmarks:
`-xSSE4.2 -ipo -O3 -no-prec-div -static`

Benchmarks using both Fortran and C:
`-xSSE4.2 -ipo -O3 -no-prec-div -static -ansi-alias`

Peak Compiler Invocation

C benchmarks (except as noted below):
`icc -m64`

482.sphinx3: `icc -m32`

C++ benchmarks (except as noted below):
`icpc -m64`

450.soplex: `icpc -m32`

Fortran benchmarks:
`ifort -m64`

Benchmarks using both Fortran and C:
`icc -m64 ifort -m64`

Peak 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`
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`

Peak Optimization Flags

C benchmarks:

433.milc: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2) -prof-use(pass 2) -static -auto-ilp32

470.lbm: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2) -prof-use(pass 2) -opt-malloc-options=3 -ansi-alias -opt-prefetch -static -auto-ilp32

482.sphinx3: -xSSE4.2 -ipo -O3 -no-prec-div -unroll2

C++ benchmarks:

444.namd: -xSSE4.2(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: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2) -prof-use(pass 2) -opt-malloc-options=3 -B /usr/share/libhugetlbfs/ -Wl,-hugetlbfs-link=BDT

453.povray: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2) -prof-use(pass 2) -unroll4 -ansi-alias -B /usr/share/libhugetlbfs/ -Wl,-melf_x86_64 -Wl,-hugetlbfs-link=BDT

Fortran benchmarks:

410.bwaves: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2) -prof-use(pass 2) -static

416.gamess: -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 -scalar-rep- -static

434.zeusmp: basepeak = yes

437.leslie3d: -xSSE4.2 -ipo -O3 -no-prec-div -B /usr/share/libhugetlbfs/ -Wl,-melf_x86_64 -Wl,-hugetlbfs-link=BDT

459.GemsFDTD: basepeak = yes

465.tonto: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2) -prof-use(pass 2) -unroll4 -auto -inline-calloc -opt-malloc-options=3 -B /usr/share/libhugetlbfs/ -Wl,-melf_x86_64 -Wl,-hugetlbfs-link=BDT

Benchmarks using both Fortran and C:

Continued on next page

Peak Optimization Flags (Continued)

435.gromacs: `-xSSE4.2`(pass 2) `-prof-gen`(pass 1) `-ipo`(pass 2) `-O3`(pass 2) `-no-prec-div`(pass 2) `-prof-use`(pass 2) `-opt-prefetch` `-static -auto-ilp32`

436.cactusADM: `basepeak = yes`

454.calculix: `basepeak = yes`

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-ic12.0-linux64-revB.20111012.html`
`http://www.spec.org/cpu2006/flags/HP-Intel-Linux-Settings-compiler-flags.html`
`http://www.spec.org/cpu2006/flags/HP-Intel-Linux-Settings-platform-flags.html`

You can also download the XML flags sources by saving the following links:
`http://www.spec.org/cpu2006/flags/Intel-ic12.0-linux64-revB.20111012.xml`
`http://www.spec.org/cpu2006/flags/HP-Intel-Linux-Settings-compiler-flags.xml`
`http://www.spec.org/cpu2006/flags/HP-Intel-Linux-Settings-platform-flags.xml`

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