SPEC® CFP2006 Result

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Hewlett-Packard Company

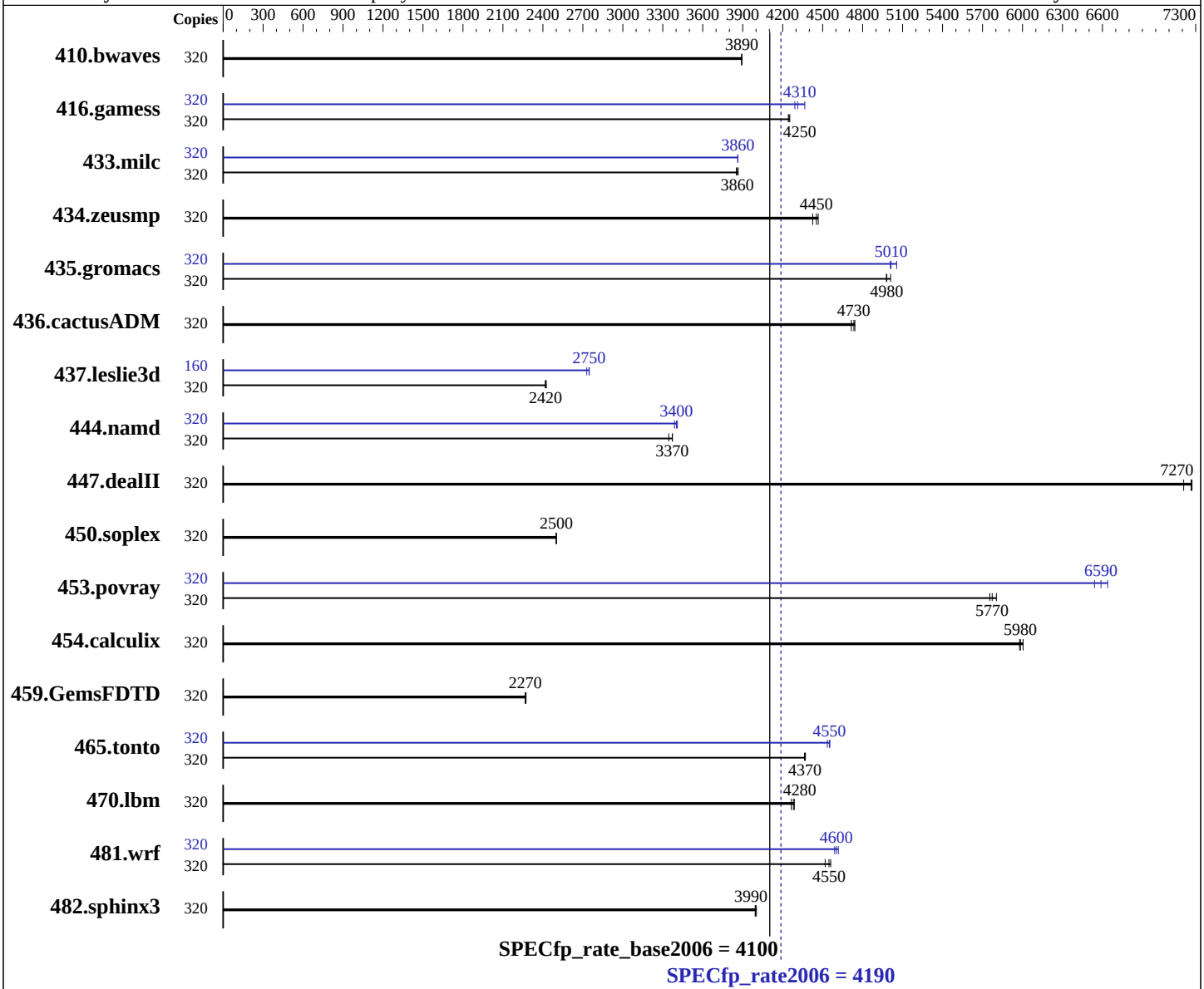
HP Integrity Superdome X
(160 core, 2.20 GHz, Intel Xeon E7-4830 v2)

SPECfp®_rate2006 = 4190

SPECfp_rate_base2006 = 4100

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

Test date: Mar-2015
Hardware Availability: Feb-2015
Software Availability: Jul-2014



Hardware

CPU Name:	Intel Xeon E7-4830 v2
CPU Characteristics:	Intel Turbo Boost Technology up to 2.70 GHz
CPU MHz:	2200
FPU:	Integrated
CPU(s) enabled:	160 cores, 16 chips, 10 cores/chip, 2 threads/core
CPU(s) orderable:	8,16 chip
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) SP3 Kernel 3.0.101-0.30-bigsmp
Compiler:	C/C++: Version 14.0.0.080 of Intel C++ Studio XE for Linux; Fortran: Version 14.0.0.080 of Intel Fortran Studio XE for Linux
Auto Parallel:	No
File System:	tmpfs
System State:	Run level 3 (multi-user)

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L3 Cache: 20 MB I+D on chip per chip
Other Cache: None
Memory: 4 TB (128 x 32 GB 4Rx4 PC3-14900L-13, ECC, running at 1067 MHz)
Disk Subsystem: 12 x 900 GB 10 K RPM SAS, RAID 6
Other Hardware: None

Base Pointers: 32/64-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	320	1117	3890	1117	3890	**1117**	**3890**	320	1117	3890	1117	3890	**1117**	**3890**
416.gamess	320	**1475**	**4250**	1473	4250	1477	4240	320	**1453**	**4310**	1460	4290	1435	4370
433.milc	320	**761**	**3860**	763	3850	760	3870	320	761	3860	760	3860	**760**	**3860**
434.zeusmp	320	658	4430	**654**	**4450**	652	4470	320	658	4430	**654**	**4450**	652	4470
435.gromacs	320	456	5010	459	4980	**459**	**4980**	320	456	5010	**456**	**5010**	452	5060
436.cactusADM	320	806	4740	**808**	**4730**	811	4720	320	806	4740	**808**	**4730**	811	4720
437.leslie3d	320	**1243**	**2420**	1244	2420	1240	2430	160	551	2730	**548**	**2750**	547	2750
444.namd	320	**761**	**3370**	761	3370	767	3340	320	**754**	**3400**	753	3410	757	3390
447.dealII	320	503	7270	508	7210	**504**	**7270**	320	503	7270	508	7210	**504**	**7270**
450.soplex	320	1068	2500	1067	2500	**1067**	**2500**	320	1068	2500	1067	2500	**1067**	**2500**
453.povray	320	293	5800	**295**	**5770**	296	5750	320	**258**	**6590**	260	6540	256	6640
454.calculix	320	**441**	**5980**	442	5980	440	6000	320	**441**	**5980**	442	5980	440	6000
459.GemsFDTD	320	**1496**	**2270**	1493	2270	1497	2270	320	**1496**	**2270**	1493	2270	1497	2270
465.tonto	320	**721**	**4370**	720	4370	722	4360	320	**692**	**4550**	691	4550	694	4540
470.lbm	320	1026	4290	1031	4260	**1027**	**4280**	320	1026	4290	1031	4260	**1027**	**4280**
481.wrf	320	784	4560	791	4520	**786**	**4550**	320	774	4620	779	4590	**777**	**4600**
482.sphinx3	320	**1561**	**3990**	1562	3990	1558	4000	320	**1561**	**3990**	1562	3990	1558	4000

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

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.
```

Operating System Notes

```
Stack size set to unlimited using "ulimit -s unlimited"
intel_idle.max_cstate=1 appended in kernel command line
Power profile set with:
 cpupower -c all frequency-set -g performance
Benchmark installed under /dev/shm/cpu2006 and mount with:
 mount -o bind /dev/shm/cpu2006 /cpu2006
Transparent Huge Pages enabled with:
```

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Operating System Notes (Continued)

```
 echo always > /sys/kernel/mm/transparent_hugepage/enabled
Filesystem page cache cleared with:
 echo 1 > /proc/sys/vm/drop_caches
runspec command invoked through numactl i.e.:
 numactl --interleave=all runspec <etc>
```

Platform Notes

```
 Firmware settings:
  Memory RAS Configuration set to Maximum Performance
Sysinfo program /cpu2006/config/sysinfo.rev6818
$Rev: 6818 $ $Date:: 2012-07-17 #$ e86d102572650a6e4d596a3cee98f191
running on hawk038os1 Tue Mar 31 07:11:19 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 E7-4830 v2 @ 2.20GHz
      16 "physical id"s (chips)
      320 "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
      physical 2: cores 0 1 2 3 4 8 9 10 11 12
      physical 3: cores 0 1 2 3 4 8 9 10 11 12
      physical 4: cores 0 1 2 3 4 8 9 10 11 12
      physical 5: cores 0 1 2 3 4 8 9 10 11 12
      physical 6: cores 0 1 2 3 4 8 9 10 11 12
      physical 7: cores 0 1 2 3 4 8 9 10 11 12
      physical 8: cores 0 1 2 3 4 8 9 10 11 12
      physical 9: cores 0 1 2 3 4 8 9 10 11 12
      physical 10: cores 0 1 2 3 4 8 9 10 11 12
      physical 11: cores 0 1 2 3 4 8 9 10 11 12
      physical 12: cores 0 1 2 3 4 8 9 10 11 12
      physical 13: cores 0 1 2 3 4 8 9 10 11 12
      physical 14: cores 0 1 2 3 4 8 9 10 11 12
      physical 15: cores 0 1 2 3 4 8 9 10 11 12
   cache size : 20480 KB

From /proc/meminfo
   MemTotal:       4235878148 kB
   HugePages_Total:       0
   Hugepagesize:       2048 kB

/usr/bin/lsb_release -d
```

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Platform Notes (Continued)

```
      SUSE Linux Enterprise Server 11 (x86_64)

   From /etc/*release* /etc/*version*
      SuSE-release:
         SUSE Linux Enterprise Server 11 (x86_64)
         VERSION = 11
         PATCHLEVEL = 3

   uname -a:
      Linux hawk038os1 3.0.101-0.30-bigsmp #1 SMP Fri May 23 16:16:00 UTC 2014
      (bd1c1f5) x86_64 x86_64 x86_64 GNU/Linux

   run-level 3 Mar 30 15:12 last=S

   SPEC is set to: /cpu2006
      Filesystem     Type   Size  Used Avail Use% Mounted on
      tmpfs          tmpfs  2.0T  273G  1.8T  14% /dev/shm

   Additional information from dmidecode:
     BIOS HP Bundle: 006.000.022 SFW: 015.095.000 02/20/2015
     Memory:
      128x HP HMT84GL7AMR4C-RD 32 GB 1067 MHz
      256x not defined not defined

   (End of data from sysinfo program)
   Regarding the sysinfo display about the memory installed, the correct amount of
   memory is 4 TB. The dmidecode description should have one line reading as:
    128x HP HMT84GL7AMR4C-RD 32 GB 1067 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 i7-860 CPU + 8GB
    memory using RedHat EL 6.4
```

Base Compiler Invocation

C benchmarks:
```
     icc   -m64
```

C++ benchmarks:
```
     icpc  -m64
```

Fortran benchmarks:
```
     ifort -m64
```

Continued on next page

Base Compiler Invocation (Continued)

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 -opt-prefetch -auto-p32 -ansi-alias
-opt-mem-layout-trans=3

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

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

Benchmarks using both Fortran and C:
-xAVX -ipo -O3 -no-prec-div -opt-prefetch -auto-p32 -ansi-alias
-opt-mem-layout-trans=3

Peak Compiler Invocation

C benchmarks:
icc -m64

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Peak Compiler Invocation (Continued)

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) -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: -xAVX(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(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: basepeak = yes

453.povray: -xAVX(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2) -opt-mem-layout-trans=3(pass 2) -prof-use(pass 2) -unroll4 -ansi-alias

Fortran benchmarks:

410.bwaves: basepeak = yes

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-

Continued on next page

Peak Optimization Flags (Continued)

434.zeusmp: basepeak = yes

437.leslie3d: -xAVX -ipo -O3 -no-prec-div -opt-prefetch

459.GemsFDTD: basepeak = yes

465.tonto: -xAVX(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

Benchmarks using both Fortran and C:

435.gromacs: -xAVX(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2) -opt-mem-layout-trans=3(pass 2) -prof-use(pass 2) -opt-prefetch -auto-ilp32

436.cactusADM: basepeak = yes

454.calculix: basepeak = yes

481.wrf: -xAVX -ipo -O3 -no-prec-div -auto-ilp32

The flags files that were used to format this result can be browsed at
http://www.spec.org/cpu2006/flags/Intel-ic14.0-official-linux64-revC.html
http://www.spec.org/cpu2006/flags/HP-Platform-Flags-Intel-V1.2-Integrity-revA.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2006/flags/Intel-ic14.0-official-linux64-revC.xml
http://www.spec.org/cpu2006/flags/HP-Platform-Flags-Intel-V1.2-Integrity-revA.xml

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