



SPEC® CFP2006 Result

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Hewlett-Packard Company

SPECfp®_rate2006 = 6880

HP Integrity Superdome X
(240 core, 2.80 GHz, Intel Xeon E7-2890 v2)

SPECfp_rate_base2006 = 6720

CPU2006 license: 3

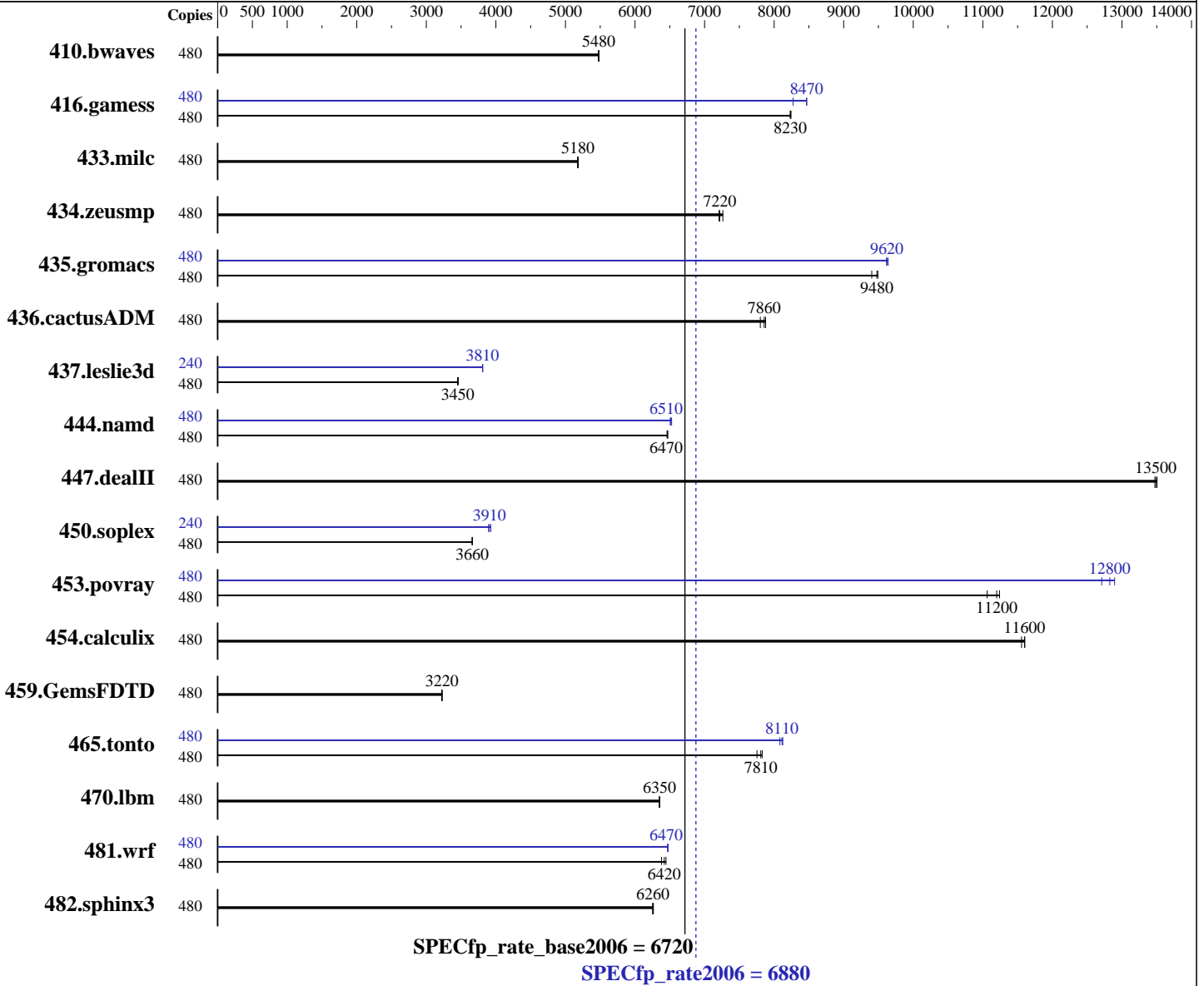
Test sponsor: Hewlett-Packard Company

Tested by: Hewlett-Packard Company

Test date: Sep-2014

Hardware Availability: Dec-2014

Software Availability: Jul-2014



Hardware

CPU Name: Intel Xeon E7-2890 v2
 CPU Characteristics: Intel Turbo Boost Technology up to 3.40 GHz
 CPU MHz: 2800
 FPU: Integrated
 CPU(s) enabled: 240 cores, 16 chips, 15 cores/chip, 2 threads/core
 CPU(s) orderable: 8,16 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: SUSE Linux Enterprise Server 11 (x86_64) SP3
 Kernel 3.0.101-0.30-bigsmpt
 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)

Continued on next page



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L3 Cache: 37.5 MB I+D on chip per chip
Other Cache: None
Memory: 4 TB (128 x 32 GB 4Rx4 PC3-14900L-13, ECC, running at 1333 MHz)
Disk Subsystem: 8 x C8S59A, 900 GB 10K RPM SAS
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	480	1192	5470	1190	5480	1191	5480	480	1192	5470	1190	5480	1191	5480
416.gamess	480	1141	8230	1140	8240	1142	8230	480	1136	8270	1110	8470	1110	8470
433.milc	480	852	5170	850	5180	850	5180	480	852	5170	850	5180	850	5180
434.zeusmp	480	605	7220	606	7210	601	7260	480	605	7220	606	7210	601	7260
435.gromacs	480	361	9490	362	9480	364	9400	480	356	9620	356	9620	356	9640
436.cactusADM	480	730	7860	728	7880	735	7800	480	730	7860	728	7880	735	7800
437.leslie3d	480	1307	3450	1304	3460	1308	3450	240	592	3810	592	3810	592	3810
444.namd	480	596	6460	595	6470	595	6470	480	591	6510	592	6510	590	6530
447.dealII	480	407	13500	407	13500	408	13500	480	407	13500	407	13500	408	13500
450.soplex	480	1092	3660	1094	3660	1095	3660	240	512	3910	514	3900	510	3930
453.povray	480	231	11100	227	11200	228	11200	480	199	12800	201	12700	198	12900
454.calculix	480	341	11600	343	11600	341	11600	480	341	11600	343	11600	341	11600
459.GemsFDTD	480	1577	3230	1581	3220	1580	3220	480	1577	3230	1581	3220	1580	3220
465.tonto	480	603	7830	609	7750	605	7810	480	581	8120	584	8080	582	8110
470.lbm	480	1039	6350	1038	6350	1038	6360	480	1039	6350	1038	6350	1038	6360
481.wrf	480	840	6380	832	6450	835	6420	480	829	6470	828	6480	829	6470
482.sphinx3	480	1495	6260	1496	6250	1493	6260	480	1495	6260	1496	6250	1493	6260

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:

Continued on next page



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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 hawk036os1 Tue Sep 23 07:40:57 2014

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 E7-2890 v2 @ 2.80GHz
16 "physical id"s (chips)
480 "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 : 15
siblings : 30
physical 0: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14
physical 1: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14
physical 2: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14
physical 3: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14
physical 4: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14
physical 5: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14
physical 6: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14
physical 7: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14
physical 8: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14
physical 9: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14
physical 10: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14
physical 11: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14
physical 12: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14
physical 13: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14
physical 14: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14
physical 15: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14
cache size : 38400 KB
```

From /proc/meminfo

```
MemTotal: 4235862504 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 hawk036os1 3.0.101-0.30-bigsmp #1 SMP Fri May 23 16:16:00 UTC 2014
(bdlclf5) x86_64 x86_64 x86_64 GNU/Linux

run-level 3 Sep 22 16:36 last=S

SPEC is set to: /cpu2006

Filesystem	Type	Size	Used	Avail	Use%	Mounted on
tmpfs	tmpfs	2.0T	4.1G	2.0T	1%	/dev/shm

Additional information from dmidecode:

BIOS HP Bundle: 005.050.012 SFW: 014.010.000 05/07/2014

Memory:

128x HP HMT84GL7AMR4C-RD 32 GB 1867 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. Also, sysinfo gathered the wrong information from dmidecode about speed of the DIMMs. The reported 1867 MHz value is the maximum DIMM speed, but the configured speed is really 1333 MHz. The dmidecode description should have one line reading as:

128x HP HMT84GL7AMR4C-RD 32 GB 1333 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

Continued on next page

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Base Compiler Invocation (Continued)

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 -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



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Peak Compiler Invocation

C benchmarks:

icc -m64

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
 482.sphinx3: -DSPEC_CPU_LP64

Peak Optimization Flags

C benchmarks:

433.milc: basepeak = yes

470.lbm: basepeak = yes

482.sphinx3: basepeak = yes

C++ benchmarks:

Continued on next page



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Peak Optimization Flags (Continued)

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: -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-malloc-options=3

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-

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>



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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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