



SPEC[®] CFP2006 Result

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Hewlett-Packard Company

SPECfp[®]_rate2006 = 4190

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

SPECfp_rate_base2006 = 4100

CPU2006 license: 3

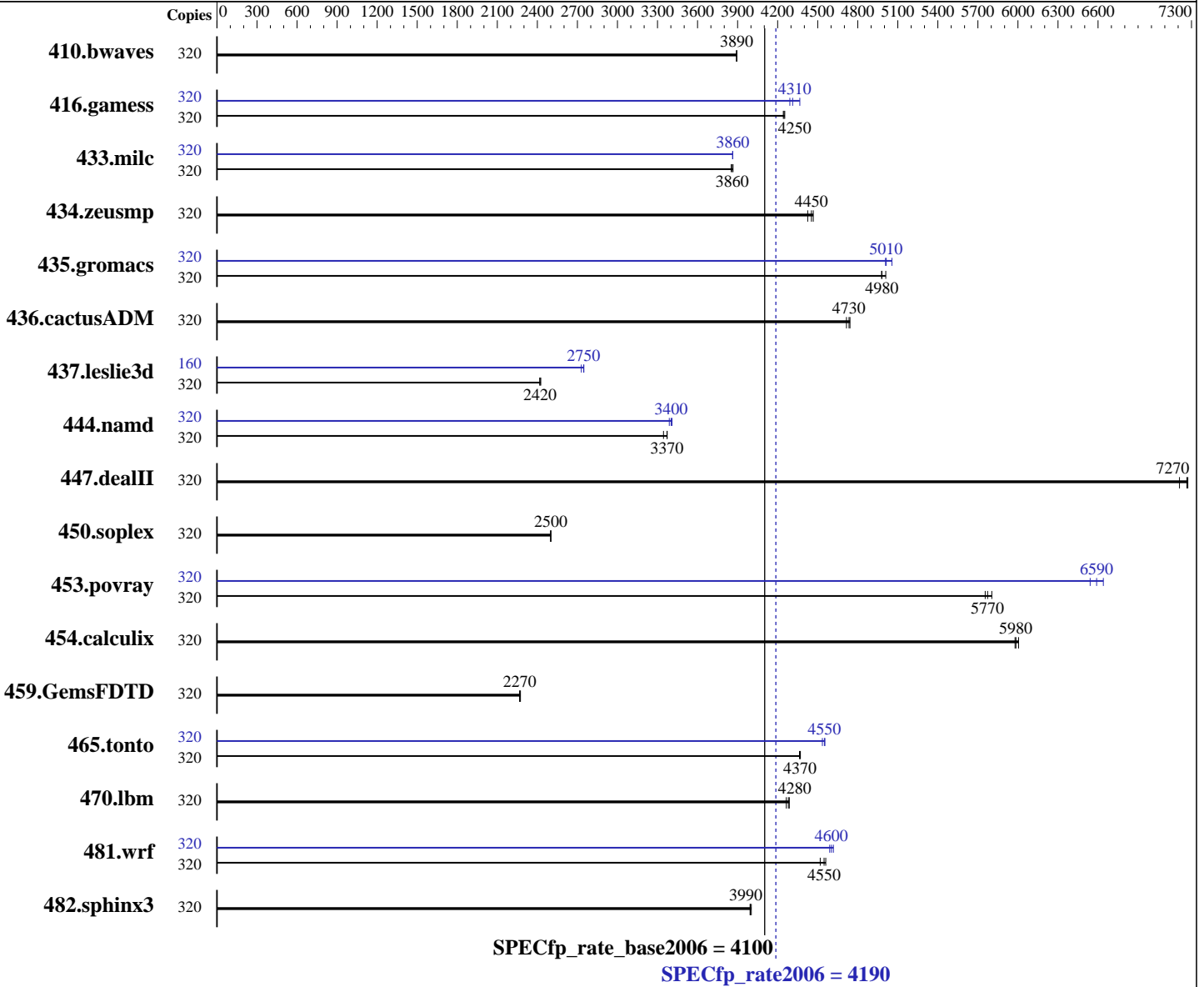
Test sponsor: Hewlett-Packard Company

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

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)

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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-bigsmpp #1 SMP Fri May 23 16:16:00 UTC 2014
(bdlclf5) 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
```

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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-

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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-alloc -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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