SPEC® CFP2006 Result

Oracle Corporation

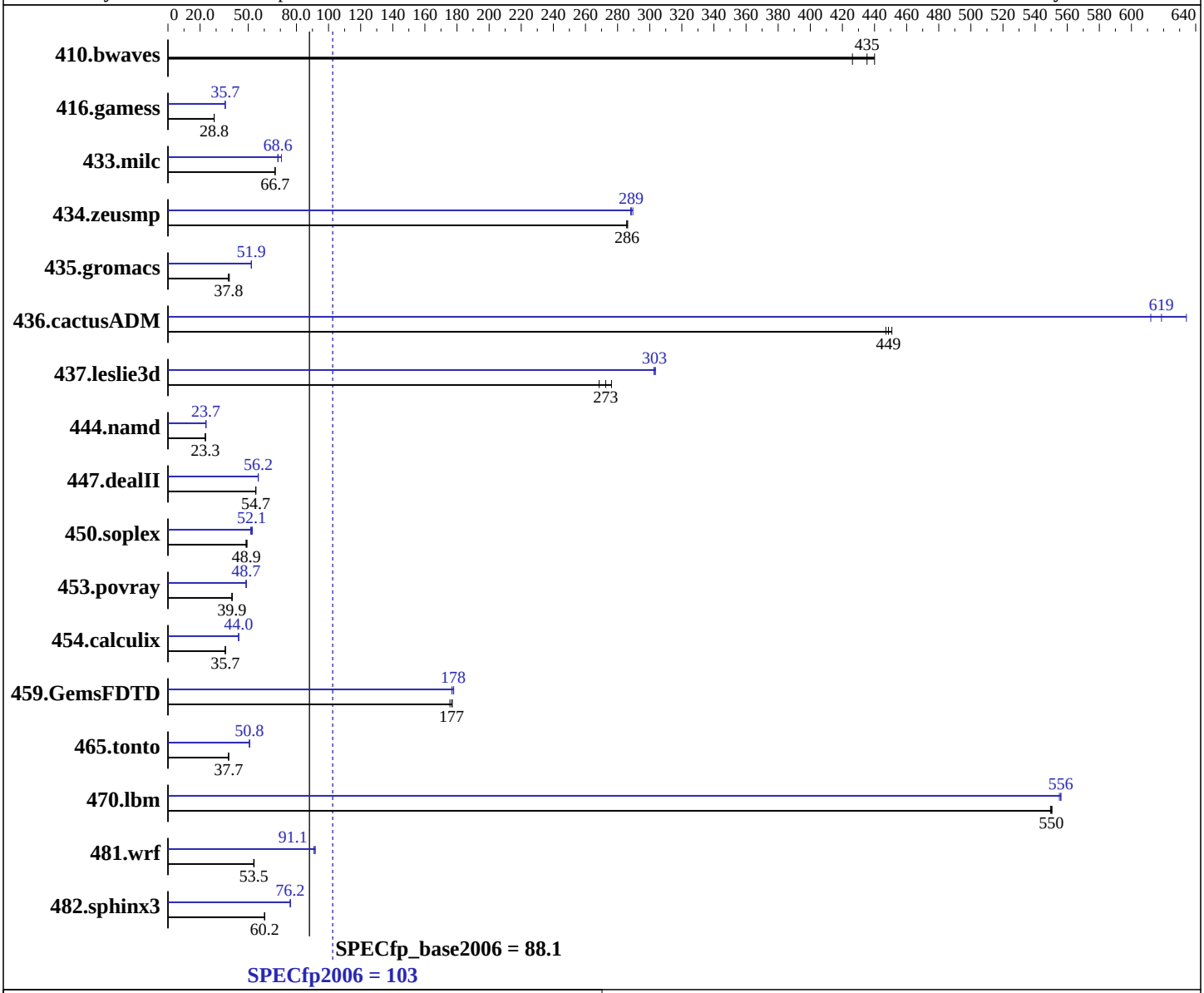
Sun Fire X4-2 (Intel Xeon E5-2697 v2 2.7GHz)

SPECfp®2006 = 103

SPECfp_base2006 = 88.1

CPU2006 license: 6
Test sponsor: Oracle Corporation
Tested by: Oracle Corporation

Test date: Aug-2013
Hardware Availability: Sep-2013
Software Availability: Nov-2013



Hardware

CPU Name:	Intel Xeon E5-2697 v2
CPU Characteristics:	Intel Turbo Boost Technology up to 3.50 GHz
CPU MHz:	2700
FPU:	Integrated
CPU(s) enabled:	24 cores, 2 chips, 12 cores/chip
CPU(s) orderable:	2 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:	Solaris 11.1 (SRU 11)
Compiler:	C/C++: Version 12.3 of Oracle Solaris Studio 10/13 Patch Set (tested with nightly build 20130822)
Auto Parallel:	Yes
File System:	zfs
System State:	Default
Base Pointers:	64-bit
Peak Pointers:	64-bit

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L3 Cache: 30 MB I+D on chip per chip
Other Cache: None
Memory: 256 GB (16 x 16 GB 2Rx4 PC3-12800R-11, ECC)
Disk Subsystem: 1 x 600 GB SAS, 10K RPM
Other Hardware: None

Other Software: None

Results Table

Benchmark	Base						Peak					
	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	30.9	440	31.9	426	**31.2**	**435**	30.9	440	31.9	426	**31.2**	**435**
416.gamess	**680**	**28.8**	681	28.8	680	28.8	**549**	**35.7**	549	35.7	549	35.7
433.milc	137	66.8	138	66.6	**138**	**66.7**	**134**	**68.6**	134	68.4	130	70.7
434.zeusmp	31.9	286	31.8	286	**31.8**	**286**	31.6	288	31.4	290	**31.5**	**289**
435.gromacs	**189**	**37.8**	190	37.7	187	38.2	137	51.9	137	52.0	**137**	**51.9**
436.cactusADM	26.5	451	**26.6**	**449**	26.7	447	**19.3**	**619**	18.8	634	19.5	612
437.leslie3d	35.0	269	34.0	276	**34.5**	**273**	31.0	304	**31.0**	**303**	31.1	303
444.namd	344	23.3	**344**	**23.3**	344	23.3	**339**	**23.7**	339	23.7	339	23.7
447.dealII	209	54.7	**209**	**54.7**	209	54.7	203	56.3	204	56.2	**204**	**56.2**
450.soplex	**171**	**48.9**	169	49.3	172	48.6	162	51.5	159	52.6	**160**	**52.1**
453.povray	**133**	**39.9**	134	39.8	133	40.1	**109**	**48.7**	109	48.8	109	48.6
454.calculix	**231**	**35.7**	231	35.7	231	35.8	188	44.0	**188**	**44.0**	187	44.0
459.GemsFDTD	60.4	176	**60.0**	**177**	59.9	177	60.0	177	**59.7**	**178**	59.6	178
465.tonto	260	37.8	**261**	**37.7**	261	37.7	194	50.7	**194**	**50.8**	194	50.8
470.lbm	25.0	551	25.0	550	**25.0**	**550**	24.8	555	**24.7**	**556**	24.7	556
481.wrf	208	53.7	**209**	**53.5**	209	53.4	**123**	**91.1**	123	91.0	122	91.8
482.sphinx3	**324**	**60.2**	324	60.2	324	60.2	256	76.2	**256**	**76.2**	256	76.2

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 to bind processes to CPU threads with pbind(1)
```

Operating System Notes

```
ulimit -s unlimited  (shell): increases stack
/etc/system parameters
   autoup=1000
   tune_t_fsflushr=10

gzip compression set using "zfs set compression=gzip <zfs-filesystem>"
```

Platform Notes

```
Default BIOS Settings were used except:
    Hyper-Threading (HT) Technology was Disabled

Sysinfo program /export/home/cpu2006v1.2/Docs/sysinfo
: 6775  2011-08-16 #f7622badcf24e01c368b1db4377c
running on bur398-85 Sat Aug 31 18:27:02 2013

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 /usr/sbin/psrinfo -pv
 Intel(r) Xeon(r) CPU E5-2697 v2 @ 2.70GHz
 x86 (GenuineIntel 306E4 family 6 model 62 step 4 clock 2693 MHz)

/usr/sbin/psrinfo -p:   2 chips
/usr/sbin/psrinfo | wc -l: 24 threads

/usr/sbin/prtconf | grep "Memory size:": 262087 Megabytes

/etc/release:
                              Oracle Solaris 11.1 X86
uname -a:
SunOS bur398-85 5.11 11.1 i86pc i386 i86pc

disk: df -h
Filesystem             Size   Used  Available Capacity  Mounted on
rpool/export/home      547G    47G       421G    11%    /export/home

(End of data from sysinfo program)
```

General Notes

```
Environment variables set by runspec before the start of the run:
MTEXCLUSIVE = "Y"
OMP_NUM_THREADS = "24"
SUNW_MP_PROCBIND = "scatter"
SUNW_MP_THR_IDLE = "spin"
```

Base Compiler Invocation

C benchmarks:
cc

C++ benchmarks:
CC

Continued on next page

Base Compiler Invocation (Continued)

Fortran benchmarks:
f90

Benchmarks using both Fortran and C:
cc f90

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
436.cactusADM: -DSPEC_CPU_LP64
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
459.GemsFDTD: -DSPEC_CPU_LP64
465.tonto: -DSPEC_CPU_LP64
470.lbm: -DSPEC_CPU_LP64
481.wrf: -DSPEC_CPU_LP64 -DSPEC_CPU_WORDS_LITTLEENDIAN
482.sphinx3: -DSPEC_CPU_LP64

Base Optimization Flags

C benchmarks:
-g -fast -xtarget=ivybridge -xipo=2 -m64 -xautopar -xreduction
-xalias_level=std

C++ benchmarks:
-g -fast -xtarget=ivybridge -xipo=2 -m64 -xpagesize=2M
-xalias_level=compatible -library=stdcxx4

Fortran benchmarks:
-g -fast -xtarget=ivybridge -xipo=2 -m64 -xautopar -xreduction
-xpagesize=2M

Benchmarks using both Fortran and C:
-g -fast(cc) -xtarget=ivybridge -xipo=2 -m64 -xautopar -xreduction
-xalias_level=std -fast(f90) -xpagesize=2M

Peak Compiler Invocation

C benchmarks:
cc

C++ benchmarks:
CC

Fortran benchmarks:
f90

Benchmarks using both Fortran and C:
cc f90

Peak Portability Flags

410.bwaves: -DSPEC_CPU_LP64
436.cactusADM: -DSPEC_CPU_LP64
481.wrf: -DSPEC_CPU_WORDS_LITTLEENDIAN

Peak Optimization Flags

C benchmarks:

433.milc: -g -xprofile=collect:./feedback(pass 1)
-xprofile=use:./feedback(pass 2) -fast -xtarget=ivybridge
-xipo=2 -m64 -xpagesize=2M -xalias_level=std -xautopar
-xreduction -W2,-Aparallel:nthreads=12 -lmtmalloc

470.lbm: -g -fast -xtarget=ivybridge -xipo=2 -m64 -xautopar
-xreduction -xpagesize=4K -xprefetch_level=3 -lmtmalloc

482.sphinx3: -g -xprofile=collect:./feedback(pass 1)
-xprofile=use:./feedback(pass 2) -fast -xtarget=ivybridge
-xipo=2 -m64 -xpagesize=2M -xalias_level=std -xrestrict
-xprefetch=no%auto -xautopar -xreduction
-W2,-Aparallel:nthreads=12

C++ benchmarks:

444.namd: -g -xprofile=collect:./feedback(pass 1)
-xprofile=use:./feedback(pass 2) -fast -xtarget=ivybridge
-xO3 -xprefetch=no%auto -m64 -xpagesize=2M
-xalias_level=compatible -library=stlport4

447.dealII: -g -fast -xtarget=ivybridge -xipo=2 -m64 -xpagesize=2M
-xalias_level=compatible -library=stdcxx4 -xrestrict

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Peak Optimization Flags (Continued)

450.soplex: -g -xprofile=collect:./feedback(pass 1)
-xprofile=use:./feedback(pass 2) -fast -xtarget=ivybridge
-xipo=2 -xpagesize=2M -xalias_level=compatible
-library=stlport4 -m64 -Qoption iropt -Rtile

453.povray: -g -xprofile=collect:./feedback(pass 1)
-xprofile=use:./feedback(pass 2) -fast -xtarget=ivybridge
-xprefetch=no%auto -xipo=2 -m64 -xpagesize=2M
-xalias_level=compatible -qoption iropt -Atile:skew=on
-qoption iropt -Ainline:cs=700 -library=stdcxx4

Fortran benchmarks:

410.bwaves: basepeak = yes

416.gamess: -g -fast -xtarget=ivybridge -xipo=2 -m64 -xpagesize=2M
-xunroll=1 -xvector=no%simd -xprefetch=no%auto

434.zeusmp: -g -xprofile=collect:./feedback(pass 1)
-xprofile=use:./feedback(pass 2) -fast -xtarget=ivybridge
-xipo=2 -m64 -xpagesize=2M -xautopar -xreduction

437.leslie3d: -g -xprofile=collect:./feedback(pass 1)
-xprofile=use:./feedback(pass 2) -fast -xtarget=ivybridge
-xipo=2 -m64 -xautopar -xreduction -lmtmalloc

459.GemsFDTD: Same as 434.zeusmp

465.tonto: -g -xprofile=collect:./feedback(pass 1)
-xprofile=use:./feedback(pass 2) -fast -xtarget=ivybridge
-xpagesize=2M -O3 -m64 -stackvar -xprefetch=no%auto
-xalias -xautopar -xreduction
-Qoption iropt -Aparallel:nthreads=12 -lfast_r

Benchmarks using both Fortran and C:

435.gromacs: -g -xprofile=collect:./feedback(pass 1)
-xprofile=use:./feedback(pass 2) -fast(cc) -fast(f90)
-xtarget=ivybridge -xipo=2 -m64 -xpagesize=2M -fsimple=2
-Qoption ube -fsimple=3 -O4 -xautopar -xreduction
-Qoption iropt -Aparallel:nthreads=12 -lmtmalloc

436.cactusADM: -g -xprofile=collect:./feedback(pass 1)
-xprofile=use:./feedback(pass 2) -fast(cc) -fast(f90)
-xtarget=ivybridge -m64 -xautopar -xreduction
-xpagesize=2M -lumem -lmvec -xprefetch_level=3

454.calculix: -g -fast(cc) -fast(f90) -xtarget=ivybridge -xipo=0 -m64
-xpagesize=2M -xprefetch_level=2
-xprefetch_auto_type=indirect_array_access
-Qoption ube -xprefetch_mult=24 -xunroll=2

Continued on next page

Peak Optimization Flags (Continued)

481.wrf: `-g -xprofile=collect:./feedback`(pass 1)
`-xprofile=use:./feedback`(pass 2) `-fast`(cc) `-fast`(f90)
`-xtarget=ivybridge -O4 -xchip=nehalem -xarch=sse4_2`
`-xipo=2 -m64 -xpagesize=2M -xprefetch=no%auto -xautopar`
`-xreduction -Qoption iropt -Aparallel:nthreads=12`

The flags files that were used to format this result can be browsed at
http://www.spec.org/cpu2006/flags/Oracle-Solaris-Studio12.3-x86_64.20130924.html
http://www.spec.org/cpu2006/flags/Oracle-platform-x86_64.CPUv1.2-RevA.20120425.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2006/flags/Oracle-Solaris-Studio12.3-x86_64.20130924.xml
http://www.spec.org/cpu2006/flags/Oracle-platform-x86_64.CPUv1.2-RevA.20120425.xml

For questions about this result, please contact the tester.
For other inquiries, please contact webmaster@spec.org.

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