SPEC® CFP2006 Result
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Oracle Corporation

Sun Server X3-2 (Intel Xeon E5-2690 2.9GHz)
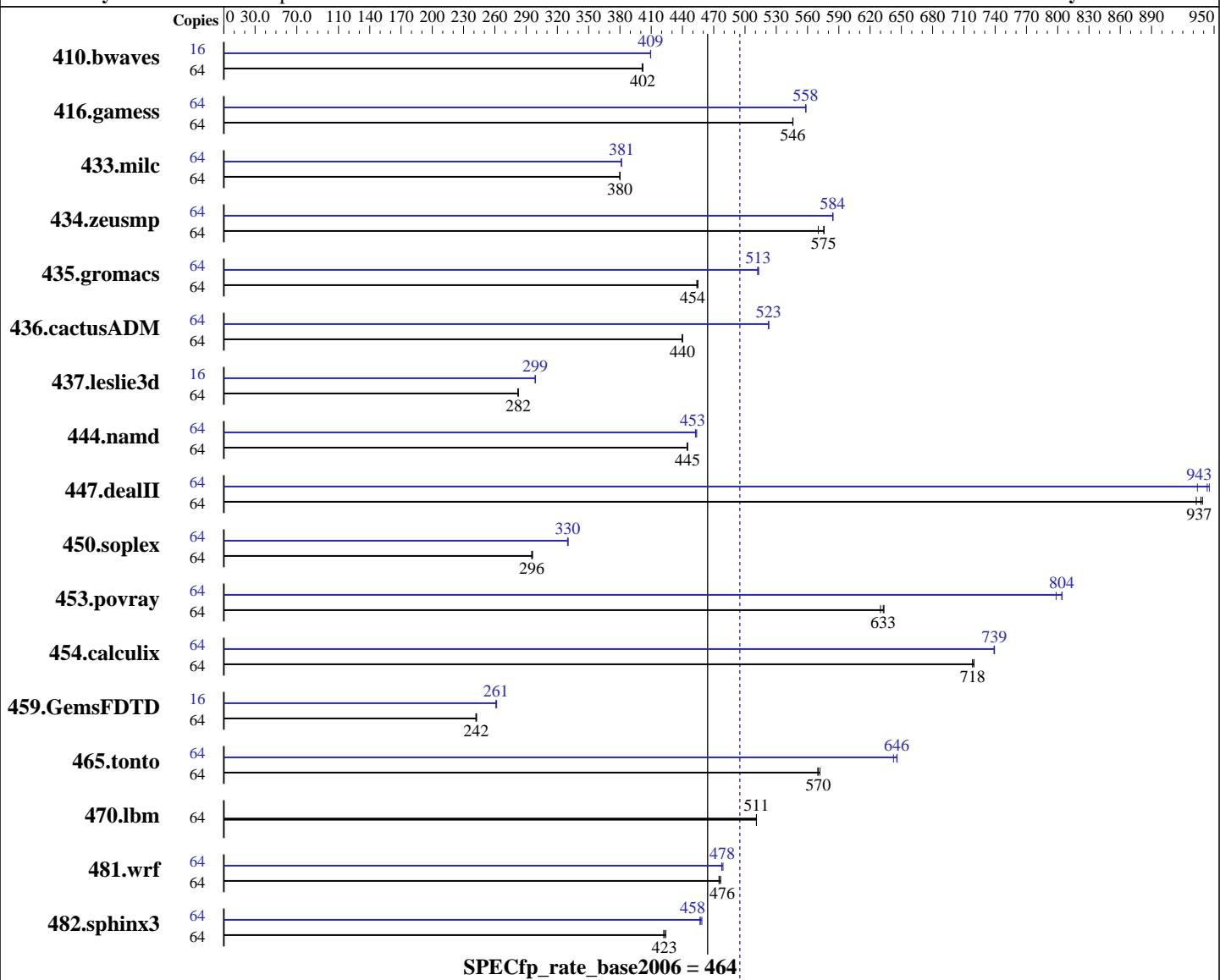
$SPECfp®\_rate2006 = 495$

$SPECfp\_rate\_base2006 = 464$

CPU2006 license: 6	**Test date:** Mar-2012
Test sponsor: Oracle Corporation	**Hardware Availability:** Apr-2012
Tested by: Oracle Corporation	**Software Availability:** Jun-2012

Copies

410.bwaves	16	409
	64	402
416.gamess	64	558
	64	546
433.milc	64	381
	64	380
434.zeusmp	64	584
	64	575
435.gromacs	64	513
	64	454
436.cactusADM	64	523
	64	440
437.leslie3d	16	299
	64	282
444.namd	64	453
	64	445
447.dealII	64	943
	64	937
450.soplex	64	330
	64	296
453.povray	64	804
	64	633
454.calculix	64	739
	64	718
459.GemsFDTD	16	261
	64	242
465.tonto	64	646
	64	570
470.lbm	64	511
481.wrf	64	478
	64	476
482.sphinx3	64	458
	64	423

$SPECfp\_rate\_base2006 = 464$

$SPECfp\_rate2006 = 495$

Hardware

CPU Name:	Intel Xeon E5-2690
CPU Characteristics:	Intel Turbo Boost Technology up to 3.80 GHz
CPU MHz:	2900
FPU:	Integrated
CPU(s) enabled:	16 cores, 2 chips, 8 cores/chip, 2 threads/core
CPU(s) orderable:	1 or 2 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:	Oracle Solaris 11 11/11 (SRU 02)
Compiler:	C/C++/Fortran: Version 12.3 of Oracle Solaris Studio (patch update 1, tested with nightly build 20120313)
Auto Parallel:	No
File System:	zfs
System State:	Default
Base Pointers:	64-bit
Peak Pointers:	32/64-bit

Continued on next page

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L3 Cache: 20 MB I+D on chip per chip	Other Software: None
Other Cache: None	
Memory: 128 GB (16 x 8 GB 2Rx4 PC3-12800R-11, ECC)	
Disk Subsystem: 1 x 300 GB 10K RPM SAS	
Other Hardware: None	

Results Table

Benchmark	Copies	**Base** Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	**Peak** Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	64	2166	401	2164	402	**2164**	**402**	16	**531**	**409**	531	409	531	410
416.gamess	64	2296	546	**2295**	**546**	2295	546	64	2243	559	2245	558	**2245**	**558**
433.milc	64	**1546**	**380**	1546	380	1546	380	64	1540	381	**1540**	**381**	1540	381
434.zeusmp	64	1011	576	1021	570	**1012**	**575**	64	997	584	996	584	**997**	**584**
435.gromacs	64	1007	454	1005	455	**1006**	**454**	64	**891**	**513**	891	513	892	512
436.cactusADM	64	1739	440	**1738**	**440**	1738	440	64	1464	522	1463	523	**1463**	**523**
437.leslie3d	64	2130	282	2132	282	**2130**	**282**	16	503	299	**503**	**299**	503	299
444.namd	64	1155	444	1154	445	**1154**	**445**	64	**1133**	**453**	1131	454	1134	452
447.dealII	64	785	933	780	939	**781**	**937**	64	784	934	**776**	**943**	774	945
450.soplex	64	1807	295	1802	296	**1806**	**296**	64	**1618**	**330**	1616	330	1619	330
453.povray	64	538	633	540	630	**538**	**633**	64	423	804	426	799	**424**	**804**
454.calculix	64	735	718	734	720	**735**	**718**	64	715	739	**714**	**739**	714	739
459.GemsFDTD	64	**2804**	**242**	2808	242	2800	243	16	**650**	**261**	650	261	648	262
465.tonto	64	1101	572	1105	570	**1104**	**570**	64	980	642	975	646	**975**	**646**
470.lbm	64	1721	511	1721	511	**1721**	**511**	64	1721	511	1721	511	**1721**	**511**
481.wrf	64	**1503**	**476**	1500	477	1505	475	64	1497	478	1493	479	**1496**	**478**
482.sphinx3	64	2956	422	2942	424	**2951**	**423**	64	2720	459	**2726**	**458**	2731	457

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 10000  (shell): increases stack

/etc/system parameters
   autoup=1000
   zfs:zfs_arc_max=0x400000000
   zfs:zfs_arc_min=0x400000000
   ncsize=0x10000
   lpg_alloc_prefer=1

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

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Platform Notes

```
Default BIOS Settings were used, except:
  Energy Performance set to Performance

Oracle's Sun Server X3-2 was formerly known as the Sun Fire X4170 M3

Single processor configuration of this system is available as of Sep-2012

Sysinfo program /export_compress/home/gnana/cpu2006v1.2/Docs/sysinfo
: 6775  2011-08-16 #f7622badcf24e01c368b1db4377c
running on bur407-122 Tue Mar 20 18:27:52 2012

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 E5-2690 0 @ 2.90GHz
 x86 (GenuineIntel 206D7 family 6 model 45 step 7 clock 2893 MHz)

/usr/sbin/psrinfo -p:   2 chips
/usr/sbin/psrinfo -pv | grep "core has" | wc -l:  16 cores
/usr/sbin/psrinfo | wc -l: 32 threads

/usr/sbin/prtconf | grep "Memory size:": 131062 Megabytes

/etc/release:
                         Oracle Solaris 11 11/11 X86
uname -a:
SunOS bur407-122 5.11 11.0 i86pc i386 i86pc

disk: df -h
Filesystem                 Size   Used  Available Capacity  Mounted on
rpool/export_compress    274G    33G        68G     33%     /export_compress

(End of data from sysinfo program)
```

General Notes

```
Environment variables set by runspec before the start of the run:
OMP_NUM_THREADS = "1"
```

Base Compiler Invocation

C benchmarks:
```
     cc
```

Continued on next page

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Base Compiler Invocation (Continued)

C++ benchmarks:
    CC

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 -xipo=2 -m64 -xalias_level=std

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

Fortran benchmarks:
    -fast -xipo=2 -m64 -xpagesize=2M

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

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Peak Compiler Invocation

C benchmarks:
    cc

C++ benchmarks:
    CC

Fortran benchmarks:
    f90

Benchmarks using both Fortran and C:
    cc f90

Peak Portability Flags

    436.cactusADM: -DSPEC_CPU_LP64
        470.lbm: -DSPEC_CPU_LP64
         481.wrf: -DSPEC_CPU_WORDS_LITTLEENDIAN

Peak Optimization Flags

C benchmarks:

    433.milc: -g -fast -xipo=2 -m64 -xpagesize=2M -xalias_level=std

    470.lbm: basepeak = yes

    482.sphinx3: -g -xprofile=collect:./feedback(pass 1)
        -xprofile=use:./feedback(pass 2) -fast -xipo=2
        -xpagesize=2M -xalias_level=std -xunroll=6
        -W2,-Aujam:noinner -lumem -lmvec

C++ benchmarks:

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

    447.dealII: -fast -xipo=2 -m64 -xpagesize=2M -xalias_level=compatible
        -library=stdcxx4 -xvector -xprefetch

    450.soplex: -xprofile=collect:./feedback(pass 1)
        -xprofile=use:./feedback(pass 2) -fast -xipo=2
        -xpagesize=2M -xalias_level=compatible -library=stlport4
        -m32 -qoption iropt -Rujam -qoption iropt -Rtile

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Peak Optimization Flags (Continued)

```
453.povray: -xprofile=collect:./feedback(pass 1)
            -xprofile=use:./feedback(pass 2) -fast -xprefetch=no%auto
            -xipo=2 -m64 -xpagesize=2M -xalias_level=compatible
            -qoption iropt -Atile:skew=on -qoption iropt -Ainline:cs=700
            -library=stlport4
```

Fortran benchmarks:

```
410.bwaves: -xprofile=collect:./feedback(pass 1)
            -xprofile=use:./feedback(pass 2) -fast -xipo=2 -m64
            -xpagesize=2M
```

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

```
434.zeusmp: Same as 410.bwaves
```

```
437.leslie3d: -xprofile=collect:./feedback(pass 1)
              -xprofile=use:./feedback(pass 2) -fast -xipo=2 -m64
```

```
459.GemsFDTD: Same as 410.bwaves
```

```
465.tonto: -xprofile=collect:./feedback(pass 1)
           -xprofile=use:./feedback(pass 2) -fast -xipo=2 -m64
           -xpagesize=2M -xvector=lib -xalias -lbsdmalloc
```

Benchmarks using both Fortran and C:

```
435.gromacs: -g -xprofile=collect:./feedback(pass 1)
             -xprofile=use:./feedback(pass 2) -fast(cc) -fast(f90)
             -xipo=2 -m64 -xpagesize=2M -fsimple=2
             -Qoption ube -fsimple=3 -xvector=no%simd
```

```
436.cactusADM: -g -fast(cc) -fast(f90) -xipo=2 -m64 -xpagesize=2M
               -lumem
```

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

```
481.wrf: -g -xprofile=collect:./feedback(pass 1)
         -xprofile=use:./feedback(pass 2) -fast(cc) -fast(f90)
         -xipo=2 -m64
```

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.html
http://www.spec.org/cpu2006/flags/Oracle-platform-x86_64.CPUv1.2-RevA.20120425.html

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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.xml
http://www.spec.org/cpu2006/flags/Oracle-platform-x86_64.CPUv1.2-RevA.20120425.xml

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