# SPEC® CFP2006 Result

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## Oracle Corporation

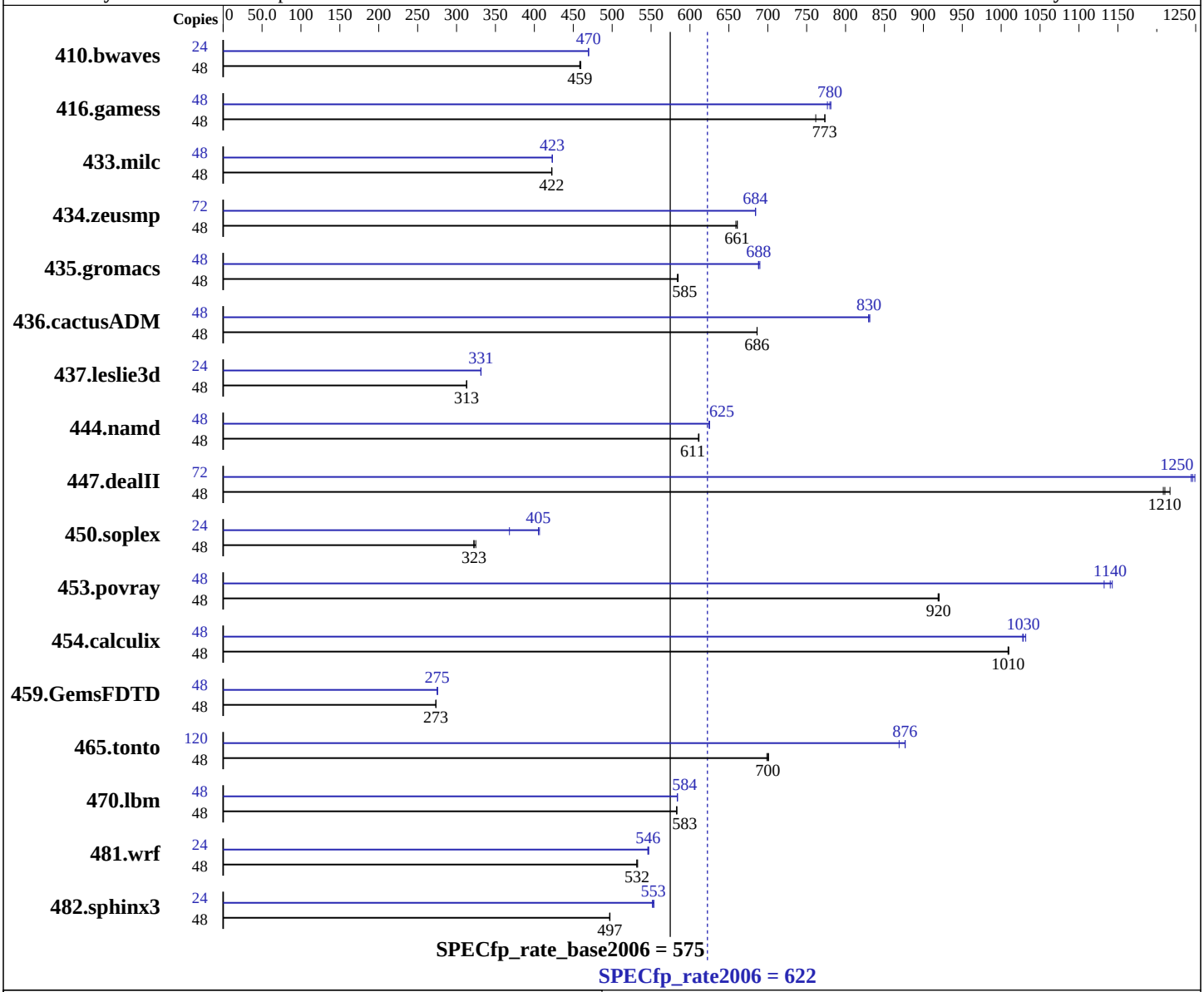
Sun Blade X4-2B (Intel Xeon E5-2697 v2 2.7GHz)

SPECfp®_rate2006 = 622

SPECfp_rate_base2006 = 575

**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, 2 threads/core |
| 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: | No |
| File System: | zfs |
| System State: | Default |
| Base Pointers: | 64-bit |
| Peak Pointers: | 32/64-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 300 GB SAS, 10K RPM
Other Hardware: None

Other Software: None

## Results Table

| Benchmark | Base | | | | | | | Peak | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Copies | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | Copies | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio |
| 410.bwaves | 48 | 1419 | 460 | **1422** | **459** | 1423 | 458 | 24 | 695 | 470 | **695** | **470** | 694 | 470 |
| 416.gamess | 48 | **1216** | **773** | 1215 | 774 | 1234 | 762 | 48 | 1210 | 777 | 1203 | 781 | **1205** | **780** |
| 433.milc | 48 | 1044 | 422 | 1043 | 423 | **1043** | **422** | 48 | 1042 | 423 | 1041 | 423 | **1042** | **423** |
| 434.zeusmp | 48 | 661 | 661 | **661** | **661** | 663 | 659 | 72 | **958** | **684** | 958 | 684 | 957 | 684 |
| 435.gromacs | 48 | **586** | **585** | 587 | 584 | 586 | 585 | 48 | 498 | 688 | **498** | **688** | 497 | 690 |
| 436.cactusADM | 48 | **836** | **686** | 836 | 686 | 836 | 686 | 48 | 691 | 830 | **691** | **830** | 690 | 831 |
| 437.leslie3d | 48 | 1442 | 313 | **1441** | **313** | 1441 | 313 | 24 | 680 | 332 | **681** | **331** | 681 | 331 |
| 444.namd | 48 | **630** | **611** | 630 | 611 | 629 | 612 | 48 | **616** | **625** | 616 | 625 | 616 | 625 |
| 447.dealII | 48 | 454 | 1210 | 451 | 1220 | **454** | **1210** | 72 | **661** | **1250** | 662 | 1240 | 659 | 1250 |
| 450.soplex | 48 | 1233 | 325 | **1241** | **323** | 1243 | 322 | 24 | 544 | 368 | 492 | 407 | **494** | **405** |
| 453.povray | 48 | **278** | **920** | 278 | 919 | 277 | 920 | 48 | 226 | 1130 | **224** | **1140** | 223 | 1140 |
| 454.calculix | 48 | 392 | 1010 | **392** | **1010** | 393 | 1010 | 48 | 385 | 1030 | 384 | 1030 | **385** | **1030** |
| 459.GemsFDTD | 48 | 1862 | 273 | 1862 | 274 | **1862** | **273** | 48 | 1847 | 276 | 1850 | 275 | **1850** | **275** |
| 465.tonto | 48 | 674 | 701 | 676 | 699 | **675** | **700** | 120 | 1359 | 869 | 1347 | 877 | **1347** | **876** |
| 470.lbm | 48 | 1131 | 583 | 1131 | 583 | **1131** | **583** | 48 | 1129 | 584 | **1130** | **584** | 1130 | 584 |
| 481.wrf | 48 | 1006 | 533 | 1009 | 532 | **1008** | **532** | 24 | **491** | **546** | 491 | 546 | 490 | 547 |
| 482.sphinx3 | 48 | 1881 | 497 | 1884 | 497 | **1882** | **497** | 24 | 845 | 554 | 848 | 552 | **846** | **553** |

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
   zfs:zfs_arc_max=0x10000000
   zfs:zfs_arc_min=0x04001000
   lpg_alloc_prefer=1

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

## Platform Notes

```
Default BIOS Settings were used.
Sysinfo program /export/home/cpu2006v1.2/Docs/sysinfo
: 6775  2011-08-16 #f7622badcf24e01c368b1db4377c
running on bur408-94 Fri Aug 30 23:03:44 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 -pv | grep "core has" | wc -l:  24 cores
/usr/sbin/psrinfo | wc -l: 48 threads

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

/etc/release:
                              Oracle Solaris 11.1 X86
uname -a:
SunOS bur408-94 5.11 11.1 i86pc i386 i86pc

disk: df -h
Filesystem             Size   Used  Available Capacity  Mounted on
rpool/export/home      274G   9.2G       188G     5%    /export/home

(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

C++ benchmarks:
CC

Fortran benchmarks:
f90

Continued on next page

## Base Compiler Invocation (Continued)

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 -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 -xpagesize=2M

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

## Peak Compiler Invocation

C benchmarks:
cc

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## Peak Compiler Invocation (Continued)

C++ benchmarks:
CC

Fortran benchmarks:
f90

Benchmarks using both Fortran and C:
cc f90

## Peak Portability Flags

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

## Peak Optimization Flags

C benchmarks:

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

470.lbm: -g -fast -xtarget=ivybridge -xipo=2 -m64 -xpagesize=4K -lbsdmalloc

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

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 -xvector -xprefetch -xrestrict

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 -m32 -qoption iropt -Rujam -qoption iropt -Rtile

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# Peak Optimization Flags (Continued)

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

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

434.zeusmp: Same as 410.bwaves

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

459.GemsFDTD: Same as 410.bwaves

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

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 -xvector=no%simd

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

481.wrf: -g -xprofile=collect:./feedback(pass 1) -xprofile=use:./feedback(pass 2) -fast(cc) -fast(f90) -xtarget=ivybridge -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_64.20130924.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


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