# SPEC® CFP2006 Result
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## Oracle Corporation

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

$SPECfp^{®}\_rate2006 = 624$
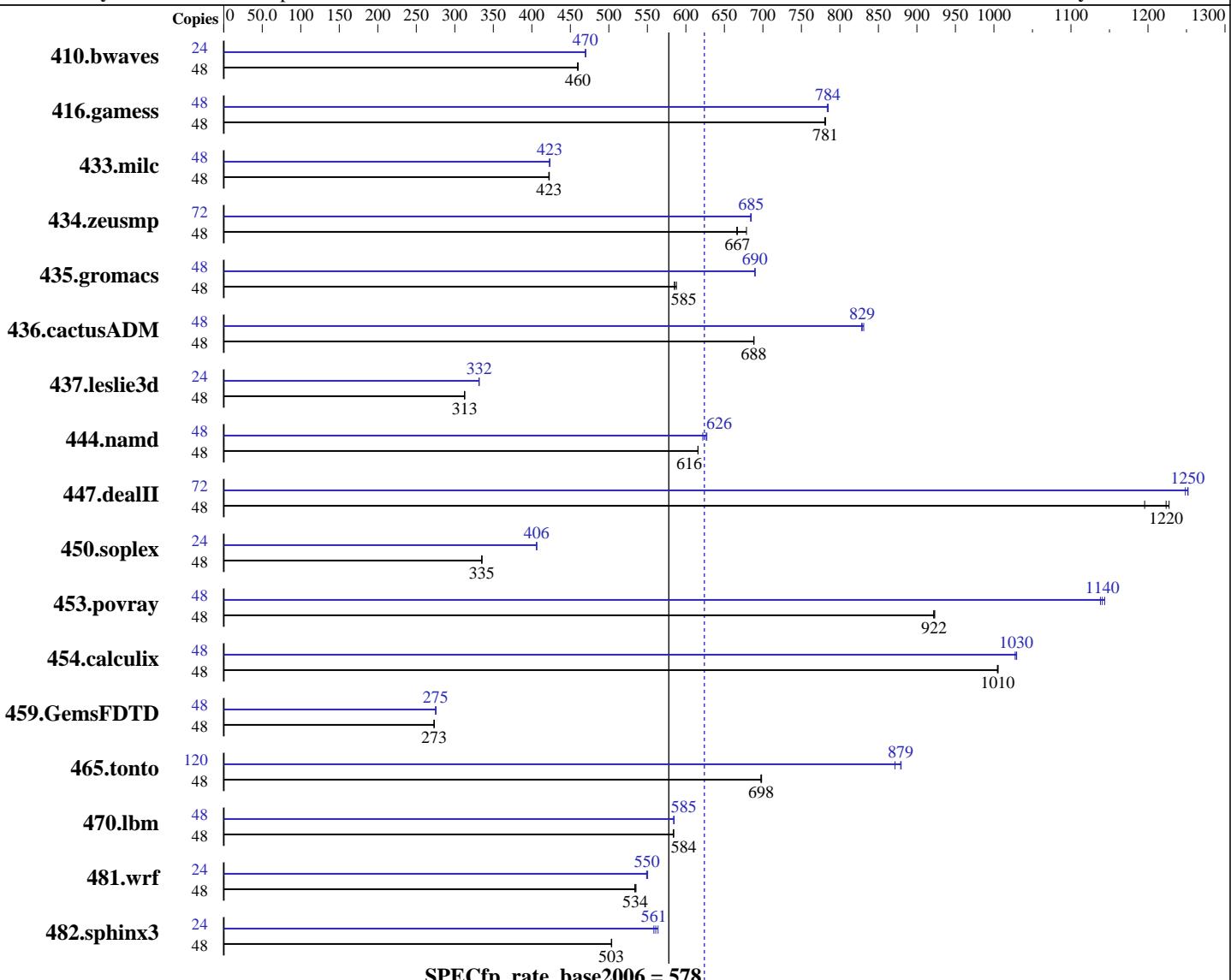
$SPECfp\_rate\_base2006 = 578$

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

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



| Benchmark | Copies | Result |
|---|---|---|
| 410.bwaves | 24 | 470 |
| | 48 | 460 |
| 416.gamess | 48 | 784 |
| | 48 | 781 |
| 433.milc | 48 | 423 |
| | 48 | 423 |
| 434.zeusmp | 72 | 685 |
| | 48 | 667 |
| 435.gromacs | 48 | 690 |
| | 48 | 585 |
| 436.cactusADM | 48 | 829 |
| | 48 | 688 |
| 437.leslie3d | 24 | 332 |
| | 48 | 313 |
| 444.namd | 48 | 626 |
| | 48 | 616 |
| 447.dealII | 72 | 1250 |
| | 48 | 1220 |
| 450.soplex | 24 | 406 |
| | 48 | 335 |
| 453.povray | 48 | 1140 |
| | 48 | 922 |
| 454.calculix | 48 | 1030 |
| | 48 | 1010 |
| 459.GemsFDTD | 48 | 275 |
| | 48 | 273 |
| 465.tonto | 120 | 879 |
| | 48 | 698 |
| 470.lbm | 48 | 585 |
| | 48 | 584 |
| 481.wrf | 24 | 550 |
| | 48 | 534 |
| 482.sphinx3 | 24 | 561 |
| | 48 | 503 |

SPECfp_rate_base2006 = 578

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### 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

*Continued on next page*

### 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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| | |
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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 | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Copies | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | Copies | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio |
| 410.bwaves | 48 | 1420 | 459 | **1419** | **460** | 1418 | 460 | 24 | 694 | 470 | 695 | 470 | **695** | **470** |
| 416.gamess | 48 | 1204 | 780 | **1203** | **781** | 1203 | 781 | 48 | 1199 | 784 | 1198 | 785 | **1198** | **784** |
| 433.milc | 48 | 1044 | 422 | **1043** | **423** | 1042 | 423 | 48 | 1042 | 423 | **1041** | **423** | 1041 | 423 |
| 434.zeusmp | 48 | 644 | 679 | 656 | 666 | **655** | **667** | 72 | 957 | 685 | **957** | **685** | 958 | 684 |
| 435.gromacs | 48 | 586 | 585 | **585** | **585** | 583 | 588 | 48 | 497 | 690 | **497** | **690** | 497 | 690 |
| 436.cactusADM | 48 | 833 | 689 | 834 | 688 | **833** | **688** | 48 | 693 | 828 | **692** | **829** | 690 | 831 |
| 437.leslie3d | 48 | 1444 | 313 | **1443** | **313** | 1442 | 313 | 24 | 680 | 332 | 681 | 331 | **680** | **332** |
| 444.namd | 48 | 625 | 616 | 625 | 616 | **625** | **616** | 48 | 614 | 627 | **615** | **626** | 619 | 622 |
| 447.dealII | 48 | 447 | 1230 | 459 | 1200 | **449** | **1220** | 72 | 658 | 1250 | 660 | 1250 | **658** | **1250** |
| 450.soplex | 48 | **1195** | **335** | 1193 | 335 | 1196 | 335 | 24 | 493 | 406 | 493 | 406 | **493** | **406** |
| 453.povray | 48 | 277 | 923 | 277 | 922 | **277** | **922** | 48 | 223 | 1140 | **224** | **1140** | 224 | 1140 |
| 454.calculix | 48 | **394** | **1010** | 394 | 1010 | 394 | 1000 | 48 | **385** | **1030** | 385 | 1030 | 385 | 1030 |
| 459.GemsFDTD | 48 | 1864 | 273 | **1864** | **273** | 1865 | 273 | 48 | 1849 | 275 | 1851 | 275 | **1851** | **275** |
| 465.tonto | 48 | 676 | 698 | **677** | **698** | 677 | 698 | 120 | 1355 | 871 | 1343 | 880 | **1343** | **879** |
| 470.lbm | 48 | 1129 | 584 | 1130 | 584 | **1129** | **584** | 48 | **1128** | **585** | 1128 | 585 | 1129 | 584 |
| 481.wrf | 48 | **1003** | **534** | 1002 | 535 | 1005 | 534 | 24 | 488 | 549 | **488** | **550** | 487 | 550 |
| 482.sphinx3 | 48 | **1858** | **503** | 1859 | 503 | 1857 | 504 | 24 | **834** | **561** | 829 | 564 | 838 | 558 |

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>"
```

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**CPU2006 license:** 6
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**Test date:** Sep-2013
**Hardware Availability:** Sep-2013
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## Platform Notes

```
  Default BIOS Settings were used.

  Sysinfo program /export/home/cpu2006v1.2/Docs/sysinfo
  : 6775   2011-08-16 #f7622badcf24e01c368b1db4377c
  running on bur398-85 Mon Sep  2 14:07:04 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 bur398-85 5.11 11.1 i86pc i386 i86pc

  disk: df -h
  Filesystem            Size    Used   Available Capacity  Mounted on
  rpool/export/home     547G    69G        399G     15%     /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

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# 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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| | | | |
|---|---|---|---|
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| **Test sponsor:** | Oracle Corporation | **Hardware Availability:** | Sep-2013 |
| **Tested by:** | Oracle Corporation | **Software Availability:** | Nov-2013 |

## 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
```

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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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