



SPEC[®] CFP2006 Result

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Oracle Corporation

SPECfp[®]_rate2006 = 497

Sun Server X3-2L (Intel Xeon E5-2690 2.9GHz)

SPECfp_rate_base2006 = 461

CPU2006 license: 6

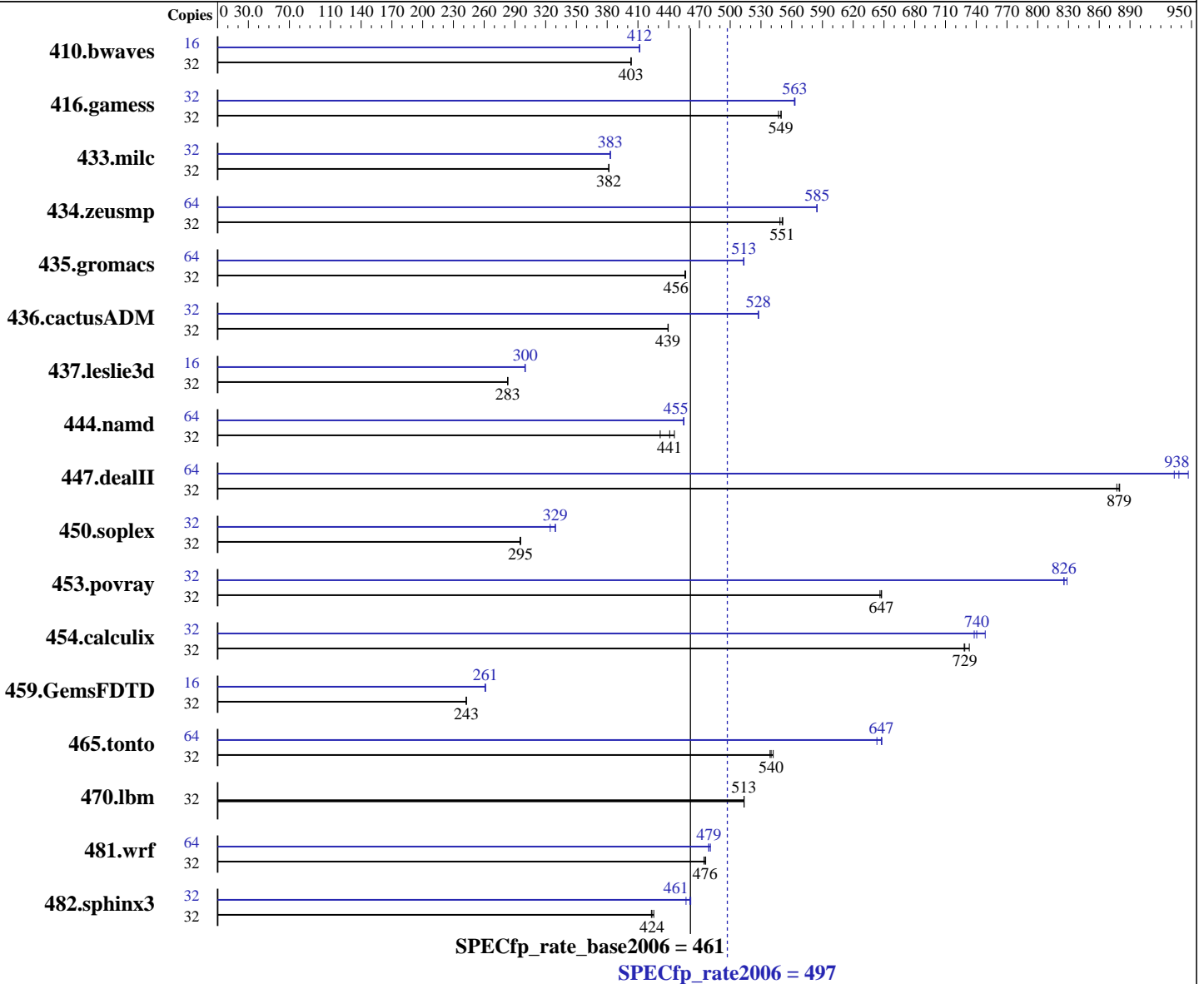
Test date: Apr-2012

Test sponsor: Oracle Corporation

Hardware Availability: Apr-2012

Tested by: Oracle Corporation

Software Availability: Jun-2012



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

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Software

Operating System: Oracle Solaris 11 11/11 (SRU 03)
 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

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L3 Cache: 20 MB I+D on chip per chip
Other Cache: None
Memory: 128 GB (16 x 8 GB 2Rx4 PC3-12800R-11, ECC)
Disk Subsystem: 1 x 600 GB 10K RPM SAS
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 | 32 | 1078 | 403 | 1078 | 403 | <u>1078</u> | <u>403</u> | 16 | <u>528</u> | <u>412</u> | 528 | 412 | 528 | 412 |
| 416.gamess | 32 | 1145 | 547 | 1140 | 550 | <u>1140</u> | <u>549</u> | 32 | <u>1113</u> | <u>563</u> | 1112 | 563 | 1114 | 563 |
| 433.milc | 32 | 769 | 382 | <u>770</u> | <u>382</u> | 770 | 382 | 32 | <u>767</u> | <u>383</u> | 767 | 383 | 767 | 383 |
| 434.zeusmp | 32 | 531 | 549 | <u>529</u> | <u>551</u> | 528 | 551 | 64 | 997 | 584 | 996 | 585 | <u>996</u> | <u>585</u> |
| 435.gromacs | 32 | 501 | 456 | 500 | 457 | <u>501</u> | <u>456</u> | 64 | 890 | 513 | 891 | 513 | <u>890</u> | <u>513</u> |
| 436.cactusADM | 32 | 870 | 440 | 870 | 439 | <u>870</u> | <u>439</u> | 32 | 725 | 527 | 725 | 528 | <u>725</u> | <u>528</u> |
| 437.leslie3d | 32 | <u>1063</u> | <u>283</u> | 1063 | 283 | 1064 | 283 | 16 | 501 | 300 | 502 | 300 | <u>501</u> | <u>300</u> |
| 444.namd | 32 | <u>582</u> | <u>441</u> | 594 | 432 | 576 | 446 | 64 | <u>1128</u> | <u>455</u> | 1130 | 454 | 1128 | 455 |
| 447.dealII | 32 | 416 | 880 | <u>416</u> | <u>879</u> | 417 | 877 | 64 | <u>781</u> | <u>938</u> | 785 | 933 | 773 | 947 |
| 450.soplex | 32 | 903 | 296 | <u>904</u> | <u>295</u> | 905 | 295 | 32 | 810 | 330 | <u>811</u> | <u>329</u> | 823 | 324 |
| 453.povray | 32 | 263 | 646 | 263 | 648 | <u>263</u> | <u>647</u> | 32 | 206 | 826 | 205 | 829 | <u>206</u> | <u>826</u> |
| 454.calculix | 32 | <u>362</u> | <u>729</u> | 363 | 728 | 360 | 733 | 32 | <u>357</u> | <u>740</u> | 353 | 749 | 358 | 738 |
| 459.GemsFDTD | 32 | <u>1400</u> | <u>243</u> | 1400 | 242 | 1399 | 243 | 16 | 651 | 261 | <u>650</u> | <u>261</u> | 649 | 261 |
| 465.tonto | 32 | 581 | 542 | 584 | 539 | <u>583</u> | <u>540</u> | 64 | 972 | 648 | <u>973</u> | <u>647</u> | 979 | 643 |
| 470.lbm | 32 | <u>856</u> | <u>513</u> | 856 | 514 | 856 | 513 | 32 | <u>856</u> | <u>513</u> | 856 | 514 | 856 | 513 |
| 481.wrf | 32 | <u>752</u> | <u>476</u> | 751 | 476 | 753 | 474 | 64 | 1492 | 479 | <u>1492</u> | <u>479</u> | 1487 | 481 |
| 482.sphinx3 | 32 | 1466 | 425 | 1474 | 423 | <u>1472</u> | <u>424</u> | 32 | 1351 | 462 | <u>1354</u> | <u>461</u> | 1365 | 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
  ncsiz=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 X3-2L was formerly known as the Sun Fire X4270 M3

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

```
Sysinfo program /export/home/gnana/cpu2006v1.2/Docs/sysinfo
: 6775 2011-08-16 #f7622badcf24e01c368b1db4377c
running on bur398-107 Sat Apr 7 02:52:39 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 2900 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 bur398-107 5.11 11.0 i86pc i386 i86pc
```

```
disk: df -h
Filesystem          Size  Used  Available Capacity  Mounted on
rpool/export/home  547G  17G   81G      17%   /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

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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:notinnter -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.dealIII: -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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