



# SPEC<sup>®</sup> CFP2006 Result

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## Oracle Corporation

SPECfp<sup>®</sup>\_rate2006 = 495

Sun Fire X4170 M3 (Intel Xeon E5-2690 2.9GHz)

SPECfp\_rate\_base2006 = 464

CPU2006 license: 6

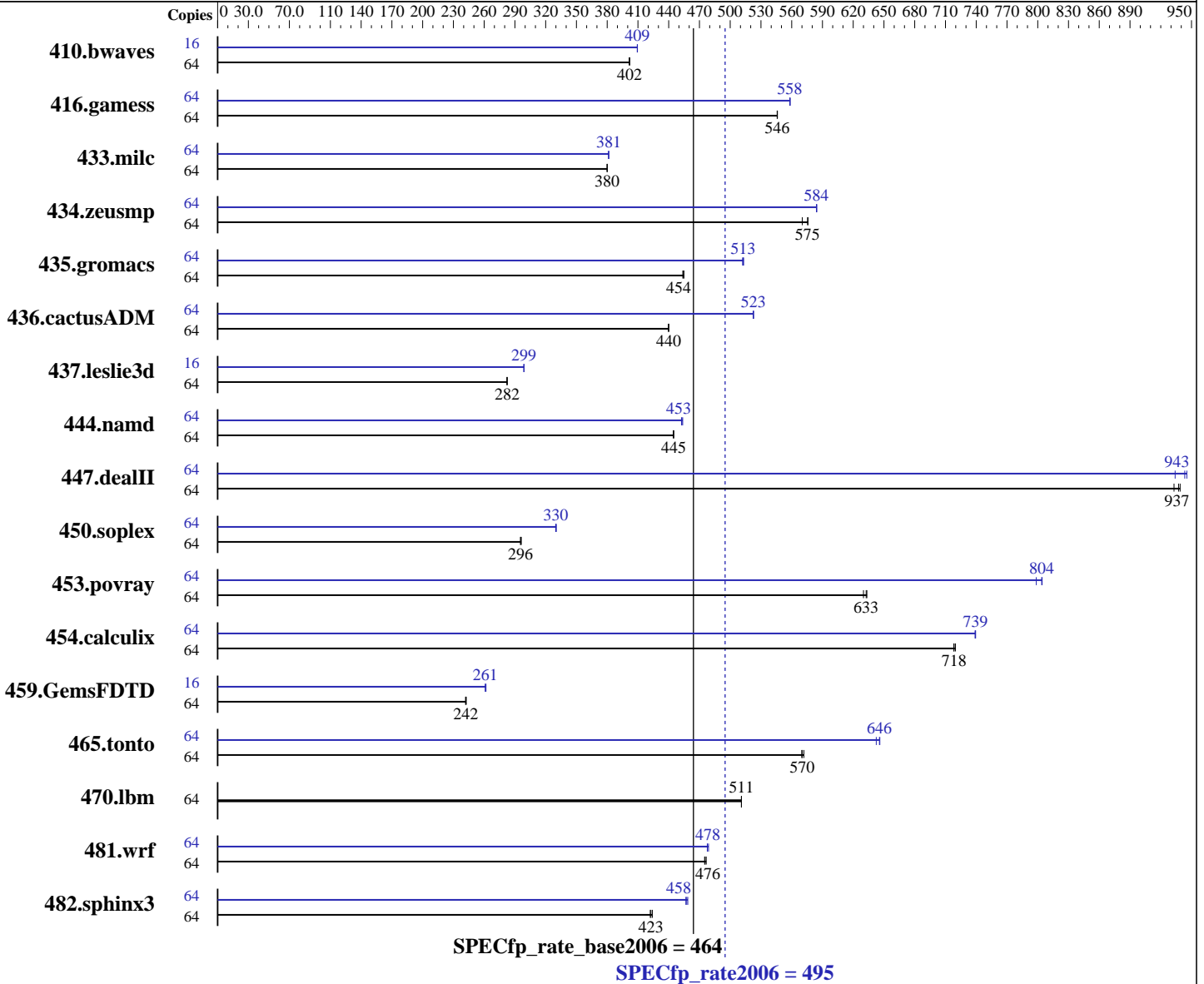
Test date: Mar-2012

Test sponsor: Oracle Corporation

Hardware Availability: Apr-2012

Tested by: Oracle Corporation

Software Availability: Jun-2012



### 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: 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 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

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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 300 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	64	2166	401	2164	402	<b>2164</b>	<b>402</b>	16	<b>531</b>	<b>409</b>	531	409	531	410
416.gamess	64	2296	546	<b>2295</b>	<b>546</b>	2295	546	64	2243	559	2245	558	<b>2245</b>	<b>558</b>
433.milc	64	<b>1546</b>	<b>380</b>	1546	380	1546	380	64	1540	381	<b>1540</b>	<b>381</b>	1540	381
434.zeusmp	64	1011	576	1021	570	<b>1012</b>	<b>575</b>	64	997	584	996	584	<b>997</b>	<b>584</b>
435.gromacs	64	1007	454	1005	455	<b>1006</b>	<b>454</b>	64	<b>891</b>	<b>513</b>	891	513	892	512
436.cactusADM	64	1739	440	<b>1738</b>	<b>440</b>	1738	440	64	1464	522	1463	523	<b>1463</b>	<b>523</b>
437.leslie3d	64	2130	282	2132	282	<b>2130</b>	<b>282</b>	16	503	299	<b>503</b>	<b>299</b>	503	299
444.namd	64	1155	444	1154	445	<b>1154</b>	<b>445</b>	64	<b>1133</b>	<b>453</b>	1131	454	1134	452
447.dealII	64	785	933	780	939	<b>781</b>	<b>937</b>	64	784	934	<b>776</b>	<b>943</b>	774	945
450.soplex	64	1807	295	1802	296	<b>1806</b>	<b>296</b>	64	<b>1618</b>	<b>330</b>	1616	330	1619	330
453.povray	64	538	633	540	630	<b>538</b>	<b>633</b>	64	423	804	426	799	<b>424</b>	<b>804</b>
454.calculix	64	735	718	734	720	<b>735</b>	<b>718</b>	64	715	739	<b>714</b>	<b>739</b>	714	739
459.GemsFDTD	64	<b>2804</b>	<b>242</b>	2808	242	2800	243	16	<b>650</b>	<b>261</b>	650	261	648	262
465.tonto	64	1101	572	1105	570	<b>1104</b>	<b>570</b>	64	980	642	975	646	<b>975</b>	<b>646</b>
470.lbm	64	1721	511	1721	511	<b>1721</b>	<b>511</b>	64	1721	511	1721	511	<b>1721</b>	<b>511</b>
481.wrf	64	<b>1503</b>	<b>476</b>	1500	477	1505	475	64	1497	478	1493	479	<b>1496</b>	<b>478</b>
482.sphinx3	64	2956	422	2942	424	<b>2951</b>	<b>423</b>	64	2720	459	<b>2726</b>	<b>458</b>	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 Fire X4170 M3 is now known as the Sun Server X3-2

```
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

C++ benchmarks:  
CC

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## 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 -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-Solaris-Studio12.3-x86_64.html)

[http://www.spec.org/cpu2006/flags/Oracle-platform-x86\\_64.CPUv1.2-RevA.20120425.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-Solaris-Studio12.3-x86_64.xml)

[http://www.spec.org/cpu2006/flags/Oracle-platform-x86\\_64.CPUv1.2-RevA.20120425.xml](http://www.spec.org/cpu2006/flags/Oracle-platform-x86_64.CPUv1.2-RevA.20120425.xml)

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