



# SPEC<sup>®</sup> CFP2006 Result

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## Sun Microsystems

## SPECfp<sup>®</sup>\_rate2006 = 636

## Sun SPARC Enterprise M9000

## SPECfp\_rate\_base2006 = 588

CPU2006 license: 6

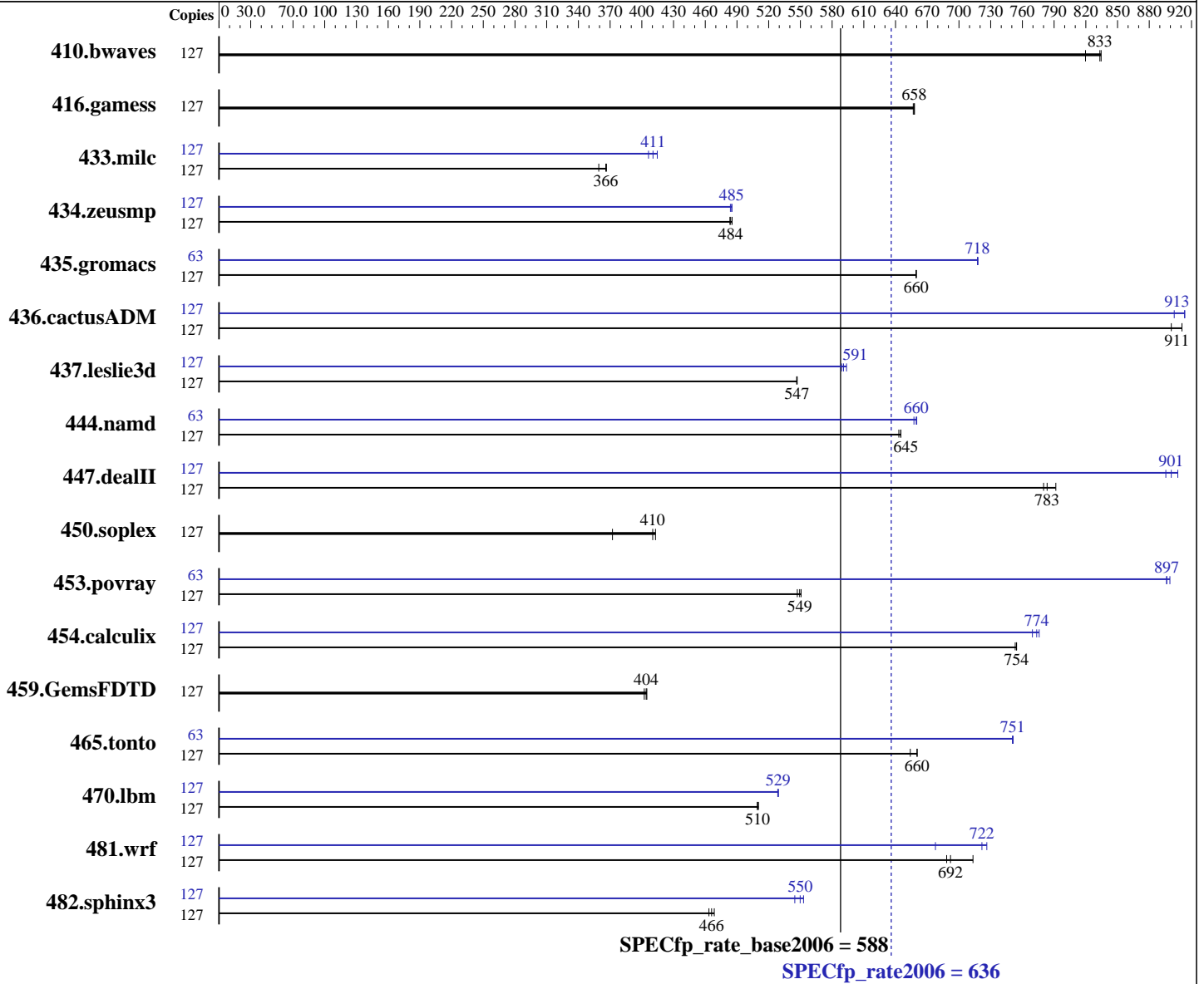
Test sponsor: Sun Microsystems

Tested by: Fujitsu Limited

Test date: Apr-2007

Hardware Availability: Apr-2007

Software Availability: May-2007



### Hardware

CPU Name: SPARC64 VI  
 CPU Characteristics:  
 CPU MHz: 2400  
 FPU: Integrated  
 CPU(s) enabled: 64 cores, 32 chips, 2 cores/chip, 2 threads/core  
 CPU(s) orderable: 1 to 8 CMUs; each CMU contains 2 or 4 chips  
 Primary Cache: 128 KB I + 128 KB D on chip per core  
 Secondary Cache: 6 MB I+D on chip per chip

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### Software

Operating System: Solaris 10 11/06  
 Compiler: Sun Studio 12 (Early Access)  
 Auto Parallel: No  
 File System: ufs  
 System State: Default  
 Base Pointers: 32-bit  
 Peak Pointers: 32-bit  
 Other Software: None



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L3 Cache: None  
 Other Cache: None  
 Memory: 256 GB (256 x 1 GB)  
 Disk Subsystem: 1095 GB RAID 0 using 15 x 73GB  
 10,000 RPM Fujitsu ETERNUS4000 Model 80  
 Other Hardware: None

### Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	127	2106	820	<b><u>2071</u></b>	<b><u>833</u></b>	2068	834	127	2106	820	<b><u>2071</u></b>	<b><u>833</u></b>	2068	834
416.gamess	127	3779	658	<b><u>3782</u></b>	<b><u>658</u></b>	3786	657	127	3779	658	<b><u>3782</u></b>	<b><u>658</u></b>	3786	657
433.milc	127	3181	367	<b><u>3186</u></b>	<b><u>366</u></b>	3245	359	127	<b><u>2840</u></b>	<b><u>411</u></b>	2869	406	2812	415
434.zeusmp	127	<b><u>2388</u></b>	<b><u>484</u></b>	2391	483	2381	485	127	2389	484	<b><u>2383</u></b>	<b><u>485</u></b>	2382	485
435.gromacs	127	1375	659	<b><u>1375</u></b>	<b><u>660</u></b>	1375	660	63	<b><u>627</u></b>	<b><u>718</u></b>	627	718	627	718
436.cactusADM	127	1666	911	<b><u>1666</u></b>	<b><u>911</u></b>	1685	901	127	<b><u>1661</u></b>	<b><u>913</u></b>	1679	904	1661	914
437.leslie3d	127	2183	547	<b><u>2183</u></b>	<b><u>547</u></b>	2185	546	127	2027	589	2011	594	<b><u>2021</u></b>	<b><u>591</u></b>
444.namd	127	1584	643	1579	645	<b><u>1579</u></b>	<b><u>645</u></b>	63	769	657	<b><u>766</u></b>	<b><u>660</u></b>	765	660
447.dealII	127	1863	780	<b><u>1855</u></b>	<b><u>783</u></b>	1835	792	127	1622	896	1602	907	<b><u>1613</u></b>	<b><u>901</u></b>
450.soplex	127	2845	372	2565	413	<b><u>2581</u></b>	<b><u>410</u></b>	127	2845	372	2565	413	<b><u>2581</u></b>	<b><u>410</u></b>
453.povray	127	1235	547	1227	551	<b><u>1230</u></b>	<b><u>549</u></b>	63	374	896	<b><u>374</u></b>	<b><u>897</u></b>	373	900
454.calculix	127	<b><u>1389</u></b>	<b><u>754</u></b>	1389	755	1391	753	127	1350	776	<b><u>1354</u></b>	<b><u>774</u></b>	1362	769
459.GemsFDTD	127	3329	405	3349	402	<b><u>3334</u></b>	<b><u>404</u></b>	127	3329	405	3349	402	<b><u>3334</u></b>	<b><u>404</u></b>
465.tonto	127	<b><u>1893</u></b>	<b><u>660</u></b>	1911	654	1892	661	63	<b><u>826</u></b>	<b><u>751</u></b>	825	751	826	751
470.lbm	127	<b><u>3424</u></b>	<b><u>510</u></b>	3419	510	3427	509	127	<b><u>3299</u></b>	<b><u>529</u></b>	3301	529	3297	529
481.wrf	127	2061	688	<b><u>2050</u></b>	<b><u>692</u></b>	1989	713	127	2093	678	1953	726	<b><u>1966</u></b>	<b><u>722</u></b>
482.sphinx3	127	5341	463	<b><u>5312</u></b>	<b><u>466</u></b>	5283	469	127	4544	545	<b><u>4502</u></b>	<b><u>550</u></b>	4476	553

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

### Operating System Notes

Processes were bound to cores using "submit" and "pbind".

These shell commands request use of local 4MB pages:

```

MSSHEAP=4MB
MSSSTACK=4MB
MADV=access_lwp
LD_PRELOAD=mpss.so.1:madv.so.1

```

'access\_lwp' means that the next light weight process to touch the specified address range will access it the most heavily.

Stack size set to unlimited via "ulimit -s unlimited"

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## Operating System Notes (Continued)

### System Tunables:

(/etc/system parameters)

maxphys=4194304

Defines the maximum size of I/O requests, in bytes.

maxpgio=1024

Defines the maximum number of page I/O requests that can be queued by the paging system.

tune\_t\_fsflushr=30

Controls how many seconds elapse between runs of the page flush daemon, fsflush.

autoup=300

Causes pages older than the listed number of seconds to be written by fsflush.

bufhwm=3000

Memory byte limit for caching I/O buffers

segmap\_percent=1

Set maximum percent memory for file system cache

## Platform Notes

"CMU" = CPU/Memory Unit; each holds 2 or 4 CPU chips.

Memory is 8-way interleaved by filling all slots with the same capacity DIMMs.

This result is measured on a Fujitsu SPARC Enterprise M9000 Server. Note that the Fujitsu SPARC Enterprise M9000 and Sun SPARC Enterprise M9000 are electrically equivalent.

## Base Compiler Invocation

### C benchmarks:

/opt/SUNWspr012\_EA070303/bin/cc

### C++ benchmarks:

/opt/SUNWspr012\_EA070303/bin/CC

### Fortran benchmarks:

/opt/SUNWspr012\_EA070303/bin/f90

### Benchmarks using both Fortran and C:

/opt/SUNWspr012\_EA070303/bin/cc /opt/SUNWspr012\_EA070303/bin/f90



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## Base Optimization Flags

C benchmarks:

```
-fast -xipo=2 -xtarget=sparc64vi -xcache=128/64/2:6144/256/12
-xarch=sparcfmaf -fma=fused -Wc,-fma=fused -xprefetch_level=2
```

C++ benchmarks:

```
-library=stlport4 -fast -xipo=2 -xtarget=sparc64vi
-xcache=128/64/2:6144/256/12 -xarch=sparcfmaf -fma=fused
-Qoption cg -fma=fused
```

Fortran benchmarks:

```
-fast -xipo=2 -xtarget=sparc64vi -xcache=128/64/2:6144/256/12
-xarch=sparcfmaf -fma=fused -Qoption cg -fma=fused -xprefetch_level=2
```

Benchmarks using both Fortran and C:

```
-fast(cc) -fast(f90) -xipo=2 -xtarget=sparc64vi
-xcache=128/64/2:6144/256/12 -xarch=sparcfmaf -fma=fused
-Wc,-fma=fused -xprefetch_level=2 -Qoption cg -fma=fused
```

## Peak Compiler Invocation

C benchmarks:

```
/opt/SUNWspr012_EA070303/bin/cc
```

C++ benchmarks:

```
/opt/SUNWspr012_EA070303/bin/CC
```

Fortran benchmarks:

```
/opt/SUNWspr012_EA070303/bin/f90
```

Benchmarks using both Fortran and C:

```
/opt/SUNWspr012_EA070303/bin/cc /opt/SUNWspr012_EA070303/bin/f90
```

## Peak Optimization Flags

C benchmarks:

```
433.milc: -fast -xipo=2 -xtarget=sparc64vi
-xcache=128/64/2:6144/256/12 -xarch=sparcfmaf -fma=fused
-Wc,-fma=fused -xalias_level=strong -xprefetch_level=2
-xprefetch_auto_type=indirect_array_access
```

```
470.lbm: -xprofile=collect:./feedback(pass 1)
-xprofile=use:./feedback(pass 2) -fast -xipo=2
-xtarget=sparc64vi -xcache=128/64/2:6144/256/12
-xarch=v8plusb -xprefetch_level=2 -fma=fused -Wc,-fma=fused
```

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## Peak Optimization Flags (Continued)

```
482.sphinx3: -xprofile=collect:./feedback(pass 1)
             -xprofile=use:./feedback(pass 2) -fast -xipo=2
             -xtarget=sparc64vi -xcache=128/64/2:6144/256/12
             -xarch=sparcfmaf -fma=fused -Wc,-fma=fused
```

C++ benchmarks:

```
444.namd: -library=stlport4 -xprofile=collect:./feedback(pass 1)
           -xprofile=use:./feedback(pass 2) -fast -xipo=2
           -xtarget=sparc64vi -xcache=128/64/2:6144/256/12
           -xarch=sparcfmaf -fma=fused -Qoption cg -fma=fused -xdepend
```

```
447.dealIII: -library=stlport4 -xprofile=collect:./feedback(pass 1)
             -xprofile=use:./feedback(pass 2) -fast -xipo=2
             -xtarget=sparc64vi -xcache=128/64/2:6144/256/12
             -xarch=sparcfmaf -fma=fused -Qoption cg -fma=fused -xdepend
             -xalias_level=compatible -xrestrict
```

450.soplex: basepeak = yes

```
453.povray: -library=stlport4 -xprofile=collect:./feedback(pass 1)
            -xprofile=use:./feedback(pass 2) -fast -xipo=2
            -xtarget=sparc64vi -xcache=128/64/2:6144/256/12
            -xarch=sparcfmaf -fma=fused -Qoption cg -fma=fused -xdepend
            -xalias_level=compatible
```

Fortran benchmarks:

410.bwaves: basepeak = yes

416.gamess: basepeak = yes

```
434.zeusmp: -fast -xipo=2 -xtarget=sparc64vi
            -xcache=128/64/2:6144/256/12 -xarch=sparcfmaf -fma=fused
            -Qoption cg -fma=fused -lmopt
```

```
437.leslie3d: -fast -xipo=2 -xtarget=sparc64vi
              -xcache=128/64/2:6144/256/12 -xarch=sparcfmaf -fma=fused
              -Qoption cg -fma=fused -xprefetch_level=2
              -xprefetch=latx:8.0
```

459.GemsFDTD: basepeak = yes

```
465.tonto: -xprofile=collect:./feedback(pass 1)
           -xprofile=use:./feedback(pass 2) -fast -xipo=2
           -xtarget=sparc64vi -xcache=128/64/2:6144/256/12
           -xarch=v8plusa -fma=fused -Qoption cg -fma=fused -lfast
```

Benchmarks using both Fortran and C:

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## Peak Optimization Flags (Continued)

```
435.gromacs: -xprofile=collect:./feedback(pass 1)
             -xprofile=use:./feedback(pass 2) -fast(cc) -fast(f90)
             -xipo=2 -xtarget=sparc64vi -xcache=128/64/2:6144/256/12
             -xarch=sparcfmaf -fma=fused -Wc,-fma=fused
             -Qoption cg -fma=fused
```

```
436.cactusADM: -fast(cc) -fast(f90) -xipo=2 -xtarget=sparc64vi
               -xcache=128/64/2:6144/256/12 -xarch=sparcfmaf -fma=fused
               -Wc,-fma=fused -Qoption cg -fma=fused
```

454.calculix: Same as 436.cactusADM

```
481.wrf: -xprofile=collect:./feedback(pass 1)
          -xprofile=use:./feedback(pass 2) -fast(cc) -fast(f90)
          -xipo=2 -xtarget=sparc64vi -xcache=128/64/2:6144/256/12
          -xarch=sparcfmaf -fma=fused -Wc,-fma=fused
          -Qoption cg -fma=fused -xprefetch_level=2
```

The flags file that was used to format this result can be browsed at

<http://www.spec.org/cpu2006/flags/Sun-Solaris-Studio12.20090714.02.html>

You can also download the XML flags source by saving the following link:

<http://www.spec.org/cpu2006/flags/Sun-Solaris-Studio12.20090714.02.xml>

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For other inquiries, please contact [webmaster@spec.org](mailto:webmaster@spec.org).

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