



SPEC® CFP2006 Result

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Sun Microsystems

SPECfp®_rate2006 = 321

Sun SPARC Enterprise M8000

SPECfp_rate_base2006 = 302

CPU2006 license: 6

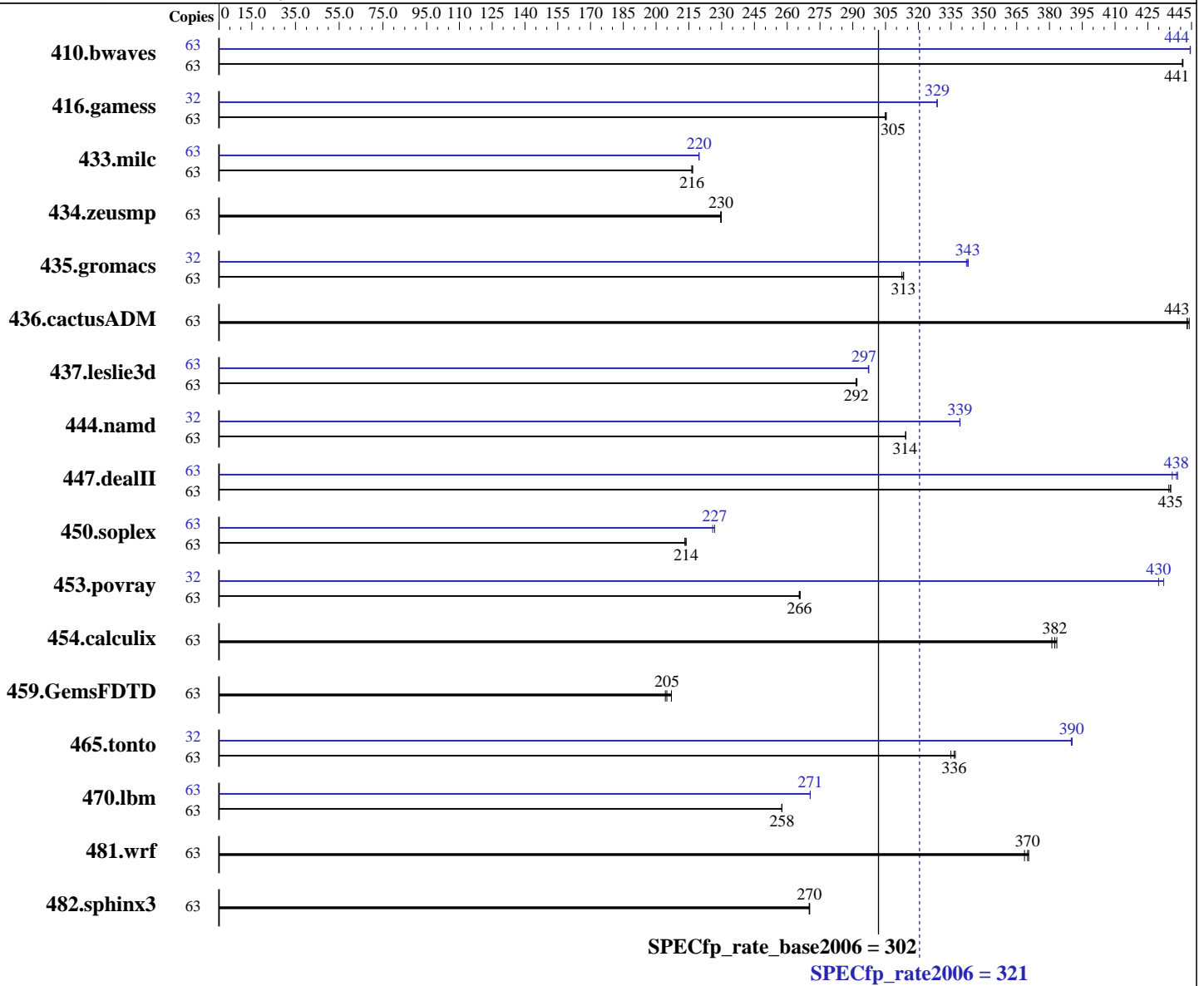
Test sponsor: Sun Microsystems

Tested by: Sun Microsystems

Test date: Apr-2007

Hardware Availability: Apr-2007

Software Availability: Jul-2007



Hardware

CPU Name: SPARC64 VI
 CPU Characteristics:
 CPU MHz: 2280
 FPU: Integrated
 CPU(s) enabled: 32 cores, 16 chips, 2 cores/chip, 2 threads/core
 CPU(s) orderable: 1 to 4 CMUs; each CMU contains 2 or 4 chips
 Primary Cache: 128 KB I + 128 KB D on chip per core
 Secondary Cache: 5 MB I+D on chip per chip

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Software

Operating System: Solaris 10 7/07 (build s10s_u4wos_03)
 Compiler: Sun Studio 12 (build 44.0)
 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 (128 x 2 GB)
Disk Subsystem: 400 GB Solaris Volume Manager RAID0
soft partition (see notes for details)
Other Hardware: None

Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	63	1942	441	1941	441	1942	441	63	1926	444	1926	445	1927	444
416.gamess	63	4046	305	4044	305	4039	305	32	1907	329	1907	329	1906	329
433.milc	63	2668	217	2673	216	2672	216	63	2633	220	2633	220	2634	220
434.zeusmp	63	2494	230	2497	230	2495	230	63	2494	230	2497	230	2495	230
435.gromacs	63	1440	312	1436	313	1436	313	32	667	343	668	342	666	343
436.cactusADM	63	1696	444	1700	443	1699	443	63	1696	444	1700	443	1699	443
437.leslie3d	63	2032	292	2030	292	2029	292	63	1993	297	1992	297	1993	297
444.namd	63	1608	314	1608	314	1608	314	32	757	339	757	339	757	339
447.dealII	63	1658	435	1655	435	1655	435	63	1643	439	1652	436	1645	438
450.soplex	63	2465	213	2459	214	2459	214	63	2326	226	2316	227	2317	227
453.povray	63	1262	266	1260	266	1262	265	32	396	430	394	432	396	430
454.calculix	63	1356	383	1364	381	1359	382	63	1356	383	1364	381	1359	382
459.GemsFDTD	63	3229	207	3262	205	3273	204	63	3229	207	3262	205	3273	204
465.tonto	63	1851	335	1843	336	1840	337	32	807	390	807	390	807	390
470.lbm	63	3361	258	3361	258	3360	258	63	3200	271	3199	271	3200	270
481.wrf	63	1902	370	1899	371	1909	369	63	1902	370	1899	371	1909	369
482.sphinx3	63	4545	270	4543	270	4547	270	63	4545	270	4543	270	4547	270

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".
The SPEC toolset was bound to processor 0.

These shell commands request use of local 4MB pages:

```
export LD_PRELOAD=madv.so.1:mpss.so.1
export MPSSHEAP=4MB
export MPSSSTACK=4MB
export MADV=access_lwp
```

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

ulimit -s 131072 was used to limit the space
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Operating System Notes (Continued)

consumed by the stack (and therefore make more space available to the heap).

```
/etc/system parameters
```

```
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
```

```
tune_t_fsflushr=3
```

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

The "webconsole" service was turned off using
svcadm disable webconsole

Platform Notes

Disk notes: The SPEC CPU tests use a 400 GB partition created from 3x Sun StorageTek 6140 stripe sets. The partition was created in 3 steps: 1. Each 6140 stripe set (RAID 0) is based on 8x 146 GB 15,000 RPM Seagate ST3146954FC FC-AL disks. 2. Solaris views these as 3 logical units (LUNs) which are striped together (RAID 0) to make a 3 TB volume using Solaris Volume Manager (SVM). 3. Lastly, SVM is then used to create one 400 GB soft partition for use by the CPU2006 output_root.

"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 was measured using a Sun SPARC Enterprise M8000 Server. Note that the Fujitsu SPARC Enterprise M8000 and Sun SPARC Enterprise M8000 are electrically equivalent.

Base Compiler Invocation

C benchmarks:

```
cc
```

C++ benchmarks:

```
CC
```

Continued on next page



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Base Compiler Invocation (Continued)

Fortran benchmarks:
f90

Benchmarks using both Fortran and C:
cc f90

Base Optimization Flags

C benchmarks:

```
-fast -fma=fused -xcache=128/64/2:5120/256/10 -xipo=2 -xpagesize=4M  
-xprefetch_level=2 -xprefetch=latx:2 -xalias_level=std  
-xprefetch_level=3 -xprefetch_auto_type=indirect_array_access
```

C++ benchmarks:

```
-xdepend -library=stlport4 -fast -fma=fused  
-xcache=128/64/2:5120/256/10 -xipo=2 -xpagesize=4M -xprefetch_level=2  
-xprefetch=latx:2 -xalias_level=compatible
```

Fortran benchmarks:

```
-fast -fma=fused -xcache=128/64/2:5120/256/10 -xipo=2 -xpagesize=4M  
-xprefetch_level=2 -xprefetch=latx:2
```

Benchmarks using both Fortran and C:

```
-fast(cc) -fast(f90) -fma=fused -xcache=128/64/2:5120/256/10 -xipo=2  
-xpagesize=4M -xprefetch_level=2 -xprefetch=latx:2 -xalias_level=std  
-xprefetch_level=3 -xprefetch_auto_type=indirect_array_access
```

Base Other Flags

C benchmarks:

```
-xjobs=16 -V -#
```

C++ benchmarks:

```
-xjobs=16 -verbose=diags,version
```

Fortran benchmarks:

```
-xjobs=16 -V -v
```

Benchmarks using both Fortran and C:

```
-xjobs=16 -V -# -v
```



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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 Optimization Flags

C benchmarks:

```
433.milc: -fast -xcache=128/64/2:5120/256/10 -xpagesize=4M -xipo=2
-xprefetch_level=2 -fsimple=1
-xprefetch_auto_type=indirect_array_access
-W2,-Ainline:rs=400 -xalias_level=std -fma=fused
-xprefetch=latx:3
```

```
470.lbm: -xprofile=collect:./feedback(pass 1)
-xprofile=use:./feedback(pass 2) -fast
-xcache=128/64/2:5120/256/10 -xpagesize=4M
-xprefetch_level=3 -xipo=2 -xrestrict -fma=fused
-Wc,-Qlp=1 -Wc,-Qlp-av=512 -Wc,-Qlp-t=1 -Wc,-Qlp-fa=1
-Wc,-Qms_pipe-prefolim=64 -xprefetch=latx:5
```

482.sphinx3: basepeak = yes

C++ benchmarks:

```
444.namd: -xdepend -library=stlport4 -fast
-xcache=128/64/2:5120/256/10 -xpagesize=4M
-xalias_level=compatible -xprefetch_level=1 -fma=fused
-xprefetch=latx:3
```

```
447.dealIII: -xdepend -library=stlport4
-xprofile=collect:./feedback(pass 1)
-xprofile=use:./feedback(pass 2) -fast
-xcache=128/64/2:5120/256/10 -xpagesize=4M
-xalias_level=compatible -xipo=2 -xrestrict -fma=fused
-xprefetch=latx:4.5
```

```
450.soplex: -xdepend -library=stlport4
-xprofile=collect:./feedback(pass 1)
-xprofile=use:./feedback(pass 2) -fast
-xcache=128/64/2:5120/256/10 -xpagesize=4M
```

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Peak Optimization Flags (Continued)

450.soplex (continued):

```
-xalias_level=compatible -xipo=2 -xprefetch_level=2
-fsimple=0 -xrestrict
-xprefetch_auto_type=indirect_array_access
-Qoption cg -Qlp-ol=1 -Qoption cg -Qlp-it=3
-Qoption cg -Qlp-imb=1 -Qoption iropt -Apf:pdl=3
```

453.povray:

```
-xdepend -library=stlport4
-xprofile=collect:./feedback(pass 1)
-xprofile=use:./feedback(pass 2) -fast
-xcache=128/64/2:5120/256/10 -xpagesize=4M
-xalias_level=compatible -xipo=2 -xrestrict -fma=fused
```

Fortran benchmarks:

410.bwaves: -fast -xcache=128/64/2:5120/256/10 -xpagesize=4M -xipo=2
-xprefetch_level=2 -fma=fused -xprefetch=latx:3

416.gamess: -fast -xcache=128/64/2:5120/256/10 -xpagesize=4M -xipo=2
-xprefetch_level=2 -fma=fused

434.zeusmp: basepeak = yes

437.leslie3d: -fast -xcache=128/64/2:5120/256/10 -xpagesize=4M
-xprefetch_level=3 -qoption cg -Qlp=1 -qoption cg -Qlp-fa=0
-qoption cg -Qlp-fl=1 -qoption cg -Qlp-av=448
-qoption cg -Qlp-t=4 -xprefetch=latx:3.5

459.GemsFDTD: basepeak = yes

465.tonto: -fast -xcache=128/64/2:5120/256/10 -xpagesize=4M -xipo=2
-xprefetch=latx:12 -lfast

Benchmarks using both Fortran and C:

435.gromacs: -xprofile=collect:./feedback(pass 1)
-xprofile=use:./feedback(pass 2) -fast(cc) -fast(f90)
-xcache=128/64/2:5120/256/10 -xpagesize=4M -xipo=2
-xinline= -xarch=generic -xchip=generic -fsimple=0
-fma=fused

436.cactusADM: basepeak = yes

454.calculix: basepeak = yes

481.wrf: basepeak = yes



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Peak Other Flags

C benchmarks:

-xjobs=16 -V -#

C++ benchmarks:

-xjobs=16 -verbose=diags,version

Fortran benchmarks:

-xjobs=16 -V -v

Benchmarks using both Fortran and C:

-xjobs=16 -V -# -v

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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Tested with SPEC CPU2006 v1.0.1.
Report generated on Tue Jul 22 11:35:41 2014 by SPEC CPU2006 PS/PDF formatter v6932.
Originally published on 1 May 2007.