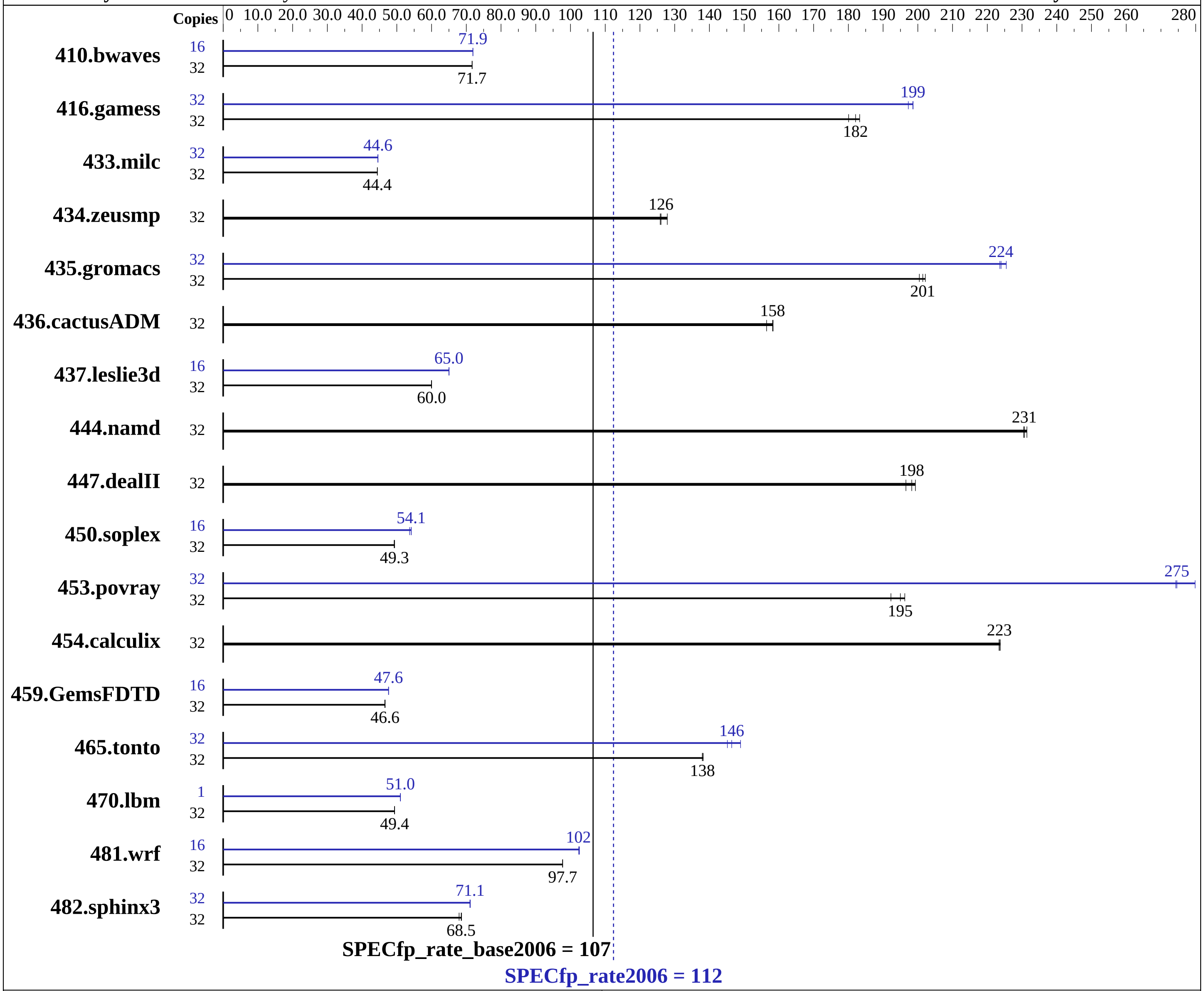
SPEC® CFP2006 Result

Sun Microsystems
Sun SPARC Enterprise M4000

SPECfp®_rate2006 = 112

SPECfp_rate_base2006 = 107

CPU2006 license: 6		**Test date:**	Jul-2008
Test sponsor:	Sun Microsystems	**Hardware Availability:**	Jul-2008
Tested by:	Sun Microsystems	**Software Availability:**	Jul-2008



Hardware

CPU Name:	SPARC64 VII
CPU Characteristics:	
CPU MHz:	2400
FPU:	Integrated
CPU(s) enabled:	16 cores, 4 chips, 4 cores/chip, 2 threads/core
CPU(s) orderable:	1 to 2 CMU; each CMU contains 2 CPU chips
Primary Cache:	64 KB I + 64 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 5/08 with patch 137111-03
Compiler:	Sun Studio 12 with patches 124867-06, 124861-07, 124863-05, 127000-05 (see patch information below)
Auto Parallel:	Yes
File System:	ufs
System State:	Default
Base Pointers:	32-bit
Peak Pointers:	32-bit

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L3 Cache: None
Other Cache: None
Memory: 64 GB (32 x 2 GB)
Disk Subsystem: 591 GB RAID 5 Sun StorageTek 2540
10 x 73 GB 15K RPM Seagate SAS disks
ufs fragment size 8192 bytes
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	6065	71.7	6069	71.7	**6067**	**71.7**	16	**3024**	**71.9**	3024	71.9	3023	71.9
416.gamess	32	3479	180	3419	183	**3441**	**182**	32	**3155**	**199**	3176	197	3154	199
433.milc	32	6621	44.4	6617	44.4	**6617**	**44.4**	32	6594	44.5	**6592**	**44.6**	6590	44.6
434.zeusmp	32	**2310**	**126**	2277	128	2314	126	32	**2310**	**126**	2277	128	2314	126
435.gromacs	32	1140	200	1130	202	**1134**	**201**	32	**1020**	**224**	1022	224	1013	225
436.cactusADM	32	2415	158	**2417**	**158**	2444	156	32	2415	158	**2417**	**158**	2444	156
437.leslie3d	32	**5012**	**60.0**	5012	60.0	5017	60.0	16	**2313**	**65.0**	2313	65.0	2314	65.0
444.namd	32	1113	231	**1113**	**231**	1109	231	32	1113	231	**1113**	**231**	1109	231
447.dealII	32	**1847**	**198**	1837	199	1862	197	32	**1847**	**198**	1837	199	1862	197
450.soplex	32	5421	49.2	5407	49.4	**5411**	**49.3**	16	2486	53.7	**2464**	**54.1**	2464	54.2
453.povray	32	885	192	867	196	**873**	**195**	32	608	280	621	274	**620**	**275**
454.calculix	32	**1181**	**223**	1180	224	1182	223	32	**1181**	**223**	1180	224	1182	223
459.GemsFDTD	32	7278	46.6	**7283**	**46.6**	7296	46.5	16	3564	47.6	3567	47.6	**3564**	**47.6**
465.tonto	32	**2282**	**138**	2278	138	2283	138	32	**2151**	**146**	2169	145	2114	149
470.lbm	32	8906	49.4	**8908**	**49.4**	8909	49.4	1	**269**	**51.0**	269	51.1	269	51.0
481.wrf	32	3656	97.8	**3657**	**97.7**	3658	97.7	16	1745	102	**1745**	**102**	1742	103
482.sphinx3	32	**9101**	**68.5**	9086	68.6	9181	67.9	32	8765	71.2	8779	71.0	**8769**	**71.1**

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

Compiler Invocation Notes

```
Sun Studio compiler patches are available at
    http://developers.sun.com/sunstudio/downloads/patches/ss12_patches.jsp
```

Submit Notes

```
Processes were assigned to specific processors using 'pbind' commands.  The
config file option 'submit' was used, along with a list of processors in the
'BIND' variable, to generate the pbind commands.  (For details, please see
the config file.)
```

Operating System Notes

```
Environment Variable Settings:

The maximum number of threads a program can create was set with:
    OMP_NUM_THREADS=32

Program threads were bound to processors with:
    SUNW_MP_PROCBIND="0-31"

Behavior of parallel threads was set with:
    SUNW_MP_THR_IDLE=SPIN
SPIN specifies that an idle thread should spin while waiting at barrier
or waiting for new parallel regions to work on.

ulimit -s 131072 was used to limit the space consumed
    by the stack (making more space available for the heap)

System Tunables (/etc/system parameters):

tune_t_fsflushr=10
    Controls how many seconds elapse between runs of the
    page flush daemon, fsflush.
autoup=600
    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

Other System Settings:

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

Platform Notes

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

This result is measured on a Sun SPARC Enterprise M4000 Server.
Note that the Sun SPARC Enterprise M4000 and Fujitsu SPARC Enterprise
M4000 are electrically equivalent.
```

Base Compiler Invocation

C benchmarks:
`cc`

C++ benchmarks:
`CC`

Fortran benchmarks:
`f90`

Benchmarks using both Fortran and C:
`cc f90`

Base Optimization Flags

C benchmarks:
`-fast -fma=fused -xipo=2 -xpagesize=4M -xprefetch_level=1`
`-xalias_level=std -xprefetch_auto_type=indirect_array_access`

C++ benchmarks:
`-xdepend -library=stlport4 -fast -fma=fused -xipo=2 -xpagesize=4M`
`-xprefetch_level=1 -xalias_level=compatible`

Fortran benchmarks:
`-fast -fma=fused -xipo=2 -xpagesize=4M -xprefetch_level=1`

Benchmarks using both Fortran and C:
`-fast`(cc) `-fast`(f90) `-fma=fused -xipo=2 -xpagesize=4M`
`-xprefetch_level=1 -xalias_level=std`
`-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`

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 -xpagesize=4M -xipo=2 -xprefetch_level=2 -fsimple=1 -xprefetch_auto_type=indirect_array_access -W2,-Ainline:rs=400 -xalias_level=std -fma=fused`

470.lbm: `-fast -xpagesize=4M -xprefetch_level=3 -xipo=2 -fma=fused -xvector -xarch=generic -xautopar -xreduction`

482.sphinx3: `-xprofile=collect:./feedback`(pass 1) `-xprofile=use:./feedback`(pass 2) `-fast -xpagesize=4M -xinline= -xprefetch=no -xalias_level=strong -fma=fused -xarch=sparcfmaf -lfast -ll2amm`

C++ benchmarks:

444.namd: `basepeak = yes`

447.dealII: `basepeak = yes`

450.soplex: `-xdepend -library=stlport4 -xprofile=collect:./feedback`(pass 1) `-xprofile=use:./feedback`(pass 2) `-fast -xpagesize=4M -xalias_level=compatible -xipo=2 -xprefetch=no -fsimple=0 -xrestrict`

453.povray: `-xdepend -library=stlport4 -xprofile=collect:./feedback`(pass 1) `-xprofile=use:./feedback`(pass 2) `-fast -xpagesize=4M -xalias_level=compatible -xipo=2 -xrestrict -fma=fused`

Fortran benchmarks:

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Peak Optimization Flags (Continued)

410.bwaves: -fast -xpagesize=4M -xipo=2 -xprefetch_level=2 -fma=fused

416.gamess: -xprofile=collect:./feedback(pass 1)
-xprofile=use:./feedback(pass 2) -fast -xpagesize=4M
-xipo=2 -xprefetch_level=2 -fma=fused

434.zeusmp: basepeak = yes

437.leslie3d: -fast -xpagesize=4M -xprefetch=no

459.GemsFDTD: -fast -xpagesize=4M -fsimple=1 -xprefetch=no -fma=fused

465.tonto: -fast -xpagesize=4M -xipo=2 -xarch=sparcfmaf -lfast
-ll2amm

Benchmarks using both Fortran and C:

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

436.cactusADM: basepeak = yes

454.calculix: basepeak = yes

481.wrf: -xprofile=collect:./feedback(pass 1)
-xprofile=use:./feedback(pass 2) -fast(cc) -fast(f90)
-xpagesize=4M -xipo=2 -xprefetch_level=2

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-and-gccfss4.2.20090713.html

You can also download the XML flags source by saving the following link:
http://www.spec.org/cpu2006/flags/Sun-Solaris-Studio12-and-gccfss4.2.20090713.xml

Tested with SPEC CPU2006 v1.1.
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