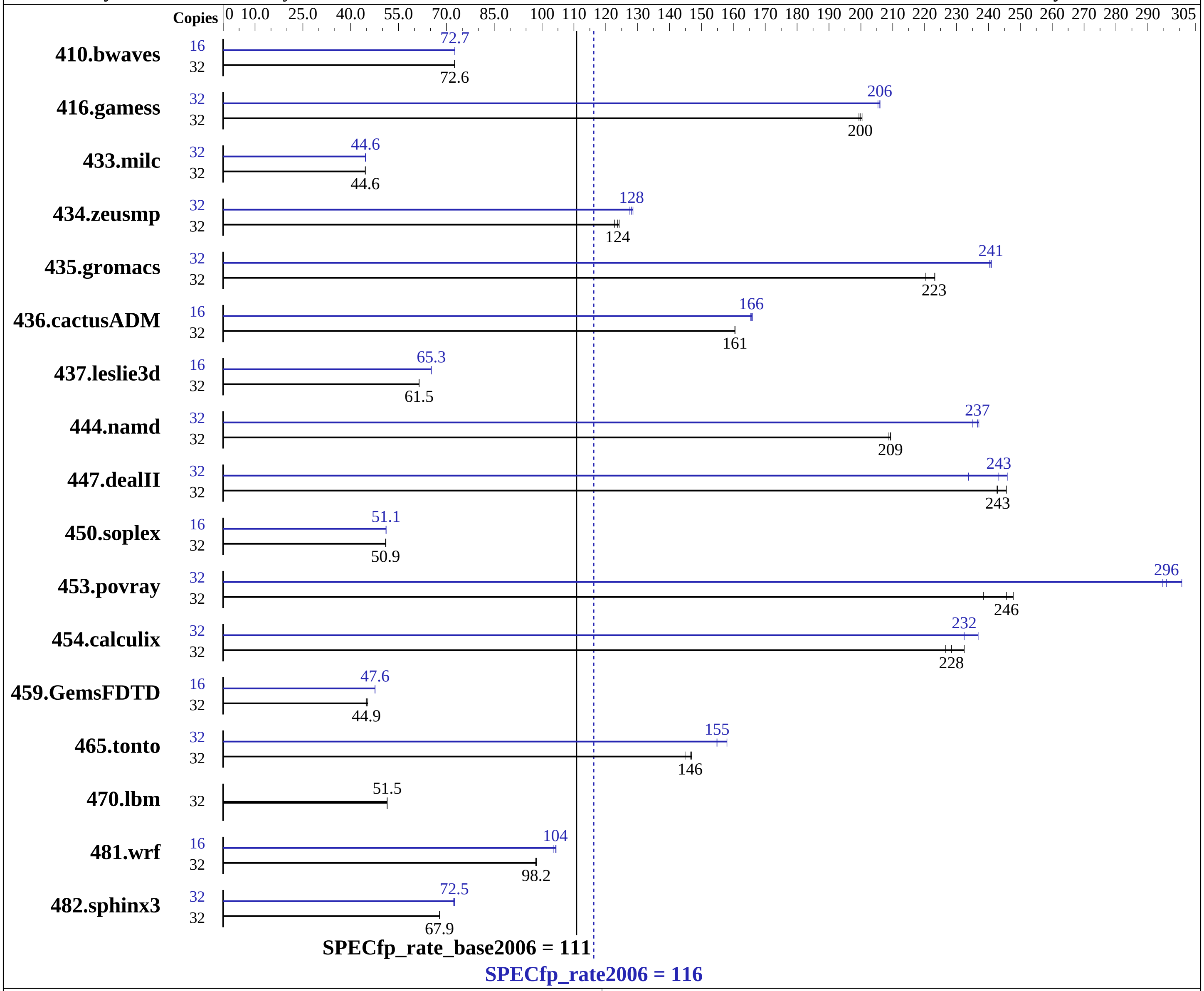
SPEC® CFP2006 Result

Sun Microsystems
Sun SPARC Enterprise M4000

SPECfp®_rate2006 = 116

SPECfp_rate_base2006 = 111

CPU2006 license: 6		**Test date:**	Sep-2009
Test sponsor:	Sun Microsystems	**Hardware Availability:**	Nov-2009
Tested by:	Sun Microsystems	**Software Availability:**	Oct-2009



Hardware

CPU Name:	SPARC64 VII
CPU Characteristics:	
CPU MHz:	2530
FPU:	Integrated
CPU(s) enabled:	16 cores, 4 chips, 4 cores/chip, 2 threads/core
CPU(s) orderable:	1 to 2 CPUMs; each CPUM contains 2 CPU chips
Primary Cache:	64 KB I + 64 KB D on chip per core
Secondary Cache:	5632 KB I+D on chip per chip

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Software

Operating System:	Solaris 10 10/09 (s10s_u8wos_06)
Compiler:	Sun Studio 12 Update 1 plus patches (see notes)
Auto Parallel:	No
File System:	zfs
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: 32 GB (32 x 1 GB), 8-way interleaved
Disk Subsystem: 2 x 146 GB SAS 10K RPM
Other Hardware: None

Results Table

	Base							Peak						
Benchmark	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	32	5992	72.6	5990	72.6	**5992**	**72.6**	16	2991	72.7	2991	72.7	**2991**	**72.7**
416.gamess	32	3127	200	**3136**	**200**	3142	199	32	3051	205	3041	206	**3043**	**206**
433.milc	32	**6592**	**44.6**	6593	44.6	6587	44.6	32	**6582**	**44.6**	6577	44.7	6583	44.6
434.zeusmp	32	**2353**	**124**	2345	124	2373	123	32	**2274**	**128**	2283	128	2266	129
435.gromacs	32	1024	223	**1025**	**223**	1037	220	32	948	241	950	240	**949**	**241**
436.cactusADM	32	2383	160	**2382**	**161**	2382	161	16	1152	166	**1154**	**166**	1156	165
437.leslie3d	32	4895	61.5	4892	61.5	**4894**	**61.5**	16	2305	65.3	**2304**	**65.3**	2303	65.3
444.namd	32	**1226**	**209**	1229	209	1226	209	32	1092	235	1083	237	**1085**	**237**
447.dealII	32	**1507**	**243**	1490	246	1508	243	32	**1505**	**243**	1566	234	1489	246
450.soplex	32	5227	51.1	5241	50.9	**5239**	**50.9**	16	2613	51.1	**2612**	**51.1**	2611	51.1
453.povray	32	**693**	**246**	714	238	687	248	32	566	301	578	295	**575**	**296**
454.calculix	32	1166	227	**1156**	**228**	1136	232	32	**1136**	**232**	1115	237	1136	232
459.GemsFDTD	32	7489	45.3	**7561**	**44.9**	7573	44.8	16	**3563**	**47.6**	3564	47.6	3562	47.7
465.tonto	32	2174	145	2144	147	**2150**	**146**	32	2033	155	1993	158	**2033**	**155**
470.lbm	32	8545	51.5	**8545**	**51.5**	8546	51.5	32	8545	51.5	**8545**	**51.5**	8546	51.5
481.wrf	32	3638	98.2	3646	98.0	**3641**	**98.2**	16	**1716**	**104**	1712	104	1727	104
482.sphinx3	32	**9190**	**67.9**	9191	67.9	9178	68.0	32	8597	72.5	**8600**	**72.5**	8627	72.3

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

Compiler Invocation Notes

```
Sun Studio 12 Update 1 was used, plus patch 119963-17

Sun Studio compiler patches are available at
  http://developers.sun.com/sunstudio/downloads/patches/ss12u1_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

```
ulimit -s 131072 was used to allow the stack to grow
up to 131072 KB (aka 128 MB).  Note that saying "131072"
is preferable to "unlimited", because there is a tradeoff
between space for the stack vs. space 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.
zfs:zfs_arc_max = 0x10000000
    Control the amount of memory used by ZFS for caching

Other System Settings:

The webconsole service was turned off using
    svcadm disable webconsole

The system had 32 GB of swap space

SPEC CPU2006 used 1 disk, with zfs gzip compression.
```

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.  The Sun SPARC Enterprise M4000 and the Fujitsu
SPARC Enterprise M4000 are electrically equivalent.
```

General Notes

```
 Environment variables set by runspec before the start of the run:
    OMP_NUM_THREADS = "32"
    SUNW_MP_PROCBIND = "true"
    SUNW_MP_THR_IDLE = "SPIN"
(Although these variables were set prior to the run
they did not affect performance, since the benchmarks
were compiled in serial mode.)

    447.dealII (peak): "apache_stdcxx_4_2_1" src.alt was used.
```

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General Notes (Continued)

```
447.dealII (base): "apache_stdcxx_4_2_1" src.alt was used.
```

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 -xalias_level=std
-xprefetch_auto_type=indirect_array_access -xprefetch_level=3
```

C++ benchmarks:
```
-xdepend -fast -fma=fused -xipo=2 -xpagesize=4M
-xalias_level=compatible -xprefetch=latx:0.5 -library=no%Cstd
-I/export/home/apache/stdcxx-4.2.1/include
-I/export/home/apache/stdcxx-4.2.1/build/include
-L/export/home/apache/stdcxx-4.2.1/build/lib
-R/export/home/apache/stdcxx-4.2.1/build/lib -lstd8d
```

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

Benchmarks using both Fortran and C:
```
-fast(cc) -fast(f90) -fma=fused -xipo=2 -xpagesize=4M
-xalias_level=std -xprefetch_auto_type=indirect_array_access
-xprefetch_level=3 -xprefetch_level=2
```

Base Other Flags

C benchmarks:
```
-xjobs=32 -V -#
```

C++ benchmarks:
```
-xjobs=32 -verbose=diags,version
```

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Base Other Flags (Continued)

Fortran benchmarks:
`-xjobs=32 -V -v`

Benchmarks using both Fortran and C:
`-xjobs=32 -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 -fma=fused -xipo=2 -xprefetch_level=2 -fsimple=1 -xprefetch_auto_type=indirect_array_access -W2,-Ainline:rs=400 -xalias_level=std`

470.lbm: `basepeak = yes`

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

C++ benchmarks:

444.namd: `-xdepend -xprofile=collect:./feedback`(pass 1) `-xprofile=use:./feedback`(pass 2) `-fast -xpagesize=4M -xalias_level=compatible -library=stlport4 -fma=fused -xipo=2 -xprefetch=no%auto -xlinkopt=2`

447.dealII: `-xdepend -fast -xpagesize=4M -xalias_level=compatible -library=no%Cstd -I/export/home/apache/stdcxx-4.2.1/include -I/export/home/apache/stdcxx-4.2.1/build/include -fma=fused -xipo=2 -xprefetch=latx:0.5 -L/export/home/apache/stdcxx-4.2.1/build/lib`

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Peak Optimization Flags (Continued)

447.dealII (continued):
-R/export/home/apache/stdcxx-4.2.1/build/lib -lstd8d

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

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

Fortran benchmarks:

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

416.gamess: -xprofile=collect:./feedback(pass 1) -xprofile=use:./feedback(pass 2) -fast -xpagesize=4M -fma=fused -xipo=2 -xprefetch=no%auto

434.zeusmp: -fast -xpagesize=4M -fma=fused -xipo=2 -xprefetch_level=1 -ll2amm

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

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

465.tonto: -xprofile=collect:./feedback(pass 1) -xprofile=use:./feedback(pass 2) -fast -xpagesize=4M -xipo=2 -xprefetch=no -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 -fma=fused -xipo=2 -xchip=generic -xinline= -fsimple=0

436.cactusADM: -fast(cc) -fast(f90) -xpagesize=4M -fma=fused -xipo=2 -xprefetch=latx:0.7 -fsimple=1

454.calculix: -fast(cc) -fast(f90) -xpagesize=4M -fma=fused -xipo=2 -xprefetch_level=1 -xalias_level=std -xprefetch_auto_type=indirect_array_access

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=32 -V -#`

C++ benchmarks:
`-xjobs=32 -verbose=diags,version`

Fortran benchmarks:
`-xjobs=32 -V -v`

Benchmarks using both Fortran and C:
`-xjobs=32 -V -# -v`

The flags file that was used to format this result can be browsed at
http://www.spec.org/cpu2006/flags/Sun-Solaris-Studio12-12u1-and-gccfss4.2.r4.html

You can also download the XML flags source by saving the following link:
http://www.spec.org/cpu2006/flags/Sun-Solaris-Studio12-12u1-and-gccfss4.2.r4.xml

Tested with SPEC CPU2006 v1.1.
Report generated on Wed Jul 23 04:12:13 2014 by SPEC CPU2006 PS/PDF formatter v6932.
Originally published on 28 October 2009.