



# SPEC<sup>®</sup> CINT2006 Result

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## Sun Microsystems

SPECint<sup>®</sup>\_rate2006 = 97.0

## Sun SPARC Enterprise T5220

SPECint\_rate\_base2006 = 89.1

CPU2006 license: 6

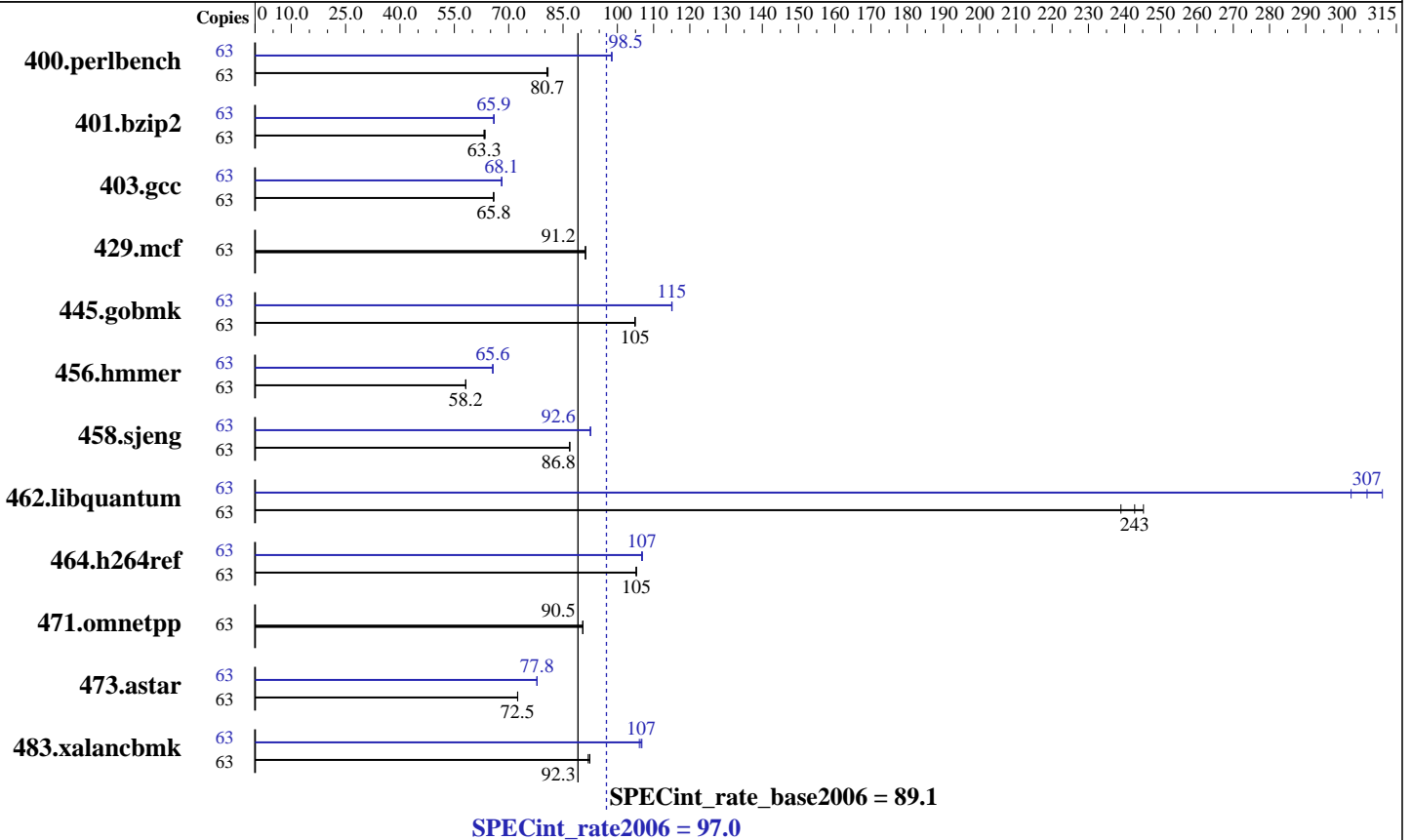
Test date: Mar-2009

Test sponsor: Sun Microsystems

Hardware Availability: Jul-2009

Tested by: Sun Microsystems

Software Availability: Jun-2009



### Hardware

CPU Name: UltraSPARC T2  
 CPU Characteristics: 1582  
 CPU MHz: Integrated  
 FPU: Integrated  
 CPU(s) enabled: 8 cores, 1 chip, 8 cores/chip, 8 threads/core  
 CPU(s) orderable: 1 chip  
 Primary Cache: 16 KB I + 8 KB D on chip per core  
 Secondary Cache: 4 MB I+D on chip per chip  
 L3 Cache: None  
 Other Cache: None  
 Memory: 64 GB (16 x 4 GB)  
 Disk Subsystem: 393 GB RAID 0 using Solaris Volume Manager on 4x 146 GB Sun 10K RPM SAS blocksize 384 KB  
 Other Hardware: None

### Software

Operating System: Solaris 10 10/08  
 Compiler: Sun Studio 12 Update 1 and gccfss V4.2.1 (see additional detail below)  
 Auto Parallel: No  
 File System: ufs  
 System State: Default  
 Base Pointers: 32-bit  
 Peak Pointers: 32-bit  
 Other Software: None



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### Results Table

| Benchmark      | Base   |              |             |              |             |             |             | Peak   |             |             |              |             |             |             |
|----------------|--------|--------------|-------------|--------------|-------------|-------------|-------------|--------|-------------|-------------|--------------|-------------|-------------|-------------|
|                | Copies | Seconds      | Ratio       | Seconds      | Ratio       | Seconds     | Ratio       | Copies | Seconds     | Ratio       | Seconds      | Ratio       | Seconds     | Ratio       |
| 400.perlbench  | 63     | <b>7626</b>  | <b>80.7</b> | 7611         | 80.9        | 7641        | 80.6        | 63     | <b>6251</b> | <b>98.5</b> | 6250         | 98.5        | 6255        | 98.4        |
| 401.bzip2      | 63     | 9574         | 63.5        | 9622         | 63.2        | <b>9602</b> | <b>63.3</b> | 63     | 9229        | 65.9        | <b>9227</b>  | <b>65.9</b> | 9213        | 66.0        |
| 403.gcc        | 63     | 7710         | 65.8        | <b>7703</b>  | <b>65.8</b> | 7695        | 65.9        | 63     | <b>7451</b> | <b>68.1</b> | 7446         | 68.1        | 7453        | 68.0        |
| 429.mcf        | 63     | 6301         | 91.2        | <b>6299</b>  | <b>91.2</b> | 6299        | 91.2        | 63     | 6301        | 91.2        | <b>6299</b>  | <b>91.2</b> | 6299        | 91.2        |
| 445.gobmk      | 63     | 6296         | 105         | <b>6301</b>  | <b>105</b>  | 6306        | 105         | 63     | 5747        | 115         | 5743         | 115         | <b>5743</b> | <b>115</b>  |
| 456.hammer     | 63     | <b>10103</b> | <b>58.2</b> | 10103        | 58.2        | 10112       | 58.1        | 63     | <b>8956</b> | <b>65.6</b> | 8954         | 65.6        | 8961        | 65.6        |
| 458.sjeng      | 63     | <b>8779</b>  | <b>86.8</b> | 8777         | 86.8        | 8780        | 86.8        | 63     | 8231        | 92.6        | 8236         | 92.6        | <b>8234</b> | <b>92.6</b> |
| 462.libquantum | 63     | <b>5377</b>  | <b>243</b>  | 5324         | 245         | 5462        | 239         | 63     | 4315        | 303         | 4195         | 311         | <b>4253</b> | <b>307</b>  |
| 464.h264ref    | 63     | 13242        | 105         | <b>13251</b> | <b>105</b>  | 13256       | 105         | 63     | 13062       | 107         | <b>13060</b> | <b>107</b>  | 13040       | 107         |
| 471.omnetpp    | 63     | 4350         | 90.5        | <b>4350</b>  | <b>90.5</b> | 4356        | 90.4        | 63     | 4350        | 90.5        | <b>4350</b>  | <b>90.5</b> | 4356        | 90.4        |
| 473.astar      | 63     | 6105         | 72.4        | <b>6102</b>  | <b>72.5</b> | 6100        | 72.5        | 63     | <b>5684</b> | <b>77.8</b> | 5682         | 77.8        | 5685        | 77.8        |
| 483.xalancbmk  | 63     | 4704         | 92.4        | 4728         | 91.9        | <b>4709</b> | <b>92.3</b> | 63     | <b>4079</b> | <b>107</b>  | 4099         | 106         | 4072        | 107         |

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

### Compiler Invocation Notes

This result was measured with pre-release build 36.0 of Sun Studio 12 Update 1

Peak also uses "GCC for SPARC Systems 4.2.1", which combines gcc with the Sun Code Generator for SPARC systems. It is invoked as "gcc", and accepts source code compatible with GCC 4.2.

For more information, including support, see <http://cooltools.sunsource.net/gcc/>

### Submit Notes

A processor set was created using

```
psrset -c 1-63
```

and the runspec process was placed into the set using

```
psrset -e 1
```

The config file option 'submit' was used to select specific processors within the set, along with the pbind command.

### 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

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## Operating System Notes (Continued)

between space for the stack vs. space for the heap.

/etc/system parameters

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

tune\_t\_fsflushr=10

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

tsb\_rss\_factor=128

Suggests that the the size of the TSB (Translation Storage Buffer) may be increased if it is more than 25% (128/512) full. Doing so may reduce TSB traps, at the cost of additional kernel memory.

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

The system had 111 GB of swap space.  
The ufs fragment size was set to 8192

## Platform Notes

This result was measured on a Sun SPARC Enterprise T5220. All of these are electronically equivalent:

- Sun SPARC Enterprise T5120
- Sun SPARC Enterprise T5220
- Fujitsu SPARC Enterprise T5120
- Fujitsu SPARC Enterprise T5220

A SPARC Enterprise 5120 can hold up to 4 disks, and a 5220 can hold up to 8. This system was tested with 4 disks; therefore, this result applies to both the 5120 and the 5220.

## Base Compiler Invocation

C benchmarks:

cc

C++ benchmarks:

CC



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## Base Portability Flags

400.perlbench: -DSPEC\_CPU\_SOLARIS\_SPARC  
403.gcc: -DSPEC\_CPU\_SOLARIS  
462.libquantum: -DSPEC\_CPU\_SOLARIS  
483.xalancbmk: -DSPEC\_CPU\_SOLARIS

## Base Optimization Flags

C benchmarks:

-g -fast -xipo=2 -xpagesize=4M -xprefetch=no%auto -xalias\_level=std  
-M /usr/lib/ld/map.bssalign

C++ benchmarks:

-g0 -library=stlport4 -fast -xipo=2 -xpagesize=4M -xprefetch=no%auto  
-xdepend -xalias\_level=compatible -M /usr/lib/ld/map.bssalign

## Base Other Flags

C benchmarks:

-xjobs=32 -V -#

C++ benchmarks:

-xjobs=32 -verbose=diags,version

## Peak Compiler Invocation

C benchmarks (except as noted below):

cc

403.gcc: gcc

456.hmmmer: gcc

C++ benchmarks:

cc

## Peak Portability Flags

400.perlbench: -DSPEC\_CPU\_SOLARIS\_SPARC  
462.libquantum: -DSPEC\_CPU\_SOLARIS  
483.xalancbmk: -DSPEC\_CPU\_SOLARIS



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## Peak Optimization Flags

C benchmarks:

```

400.perlbench: -g -xprofile=collect:./feedback(pass 1)
               -xprofile=use:./feedback(pass 2) -fast -xpagesize=4M
               -xprefetch=no%auto -M /usr/lib/ld/map.bssalign
               -xalias_level=std -xipo=2 -Xc -xrestrict -lfast

401.bzip2: -g -xprofile=collect:./feedback(pass 1)
            -xprofile=use:./feedback(pass 2) -fast -xpagesize=4M
            -M /usr/lib/ld/map.bssalign -xalias_level=strong

403.gcc: -xprofile=collect:./feedback(pass 1)
          -xprofile=use:./feedback(pass 2) -fast -xpagesize=4M
          -xprefetch=no%auto -Wl,-M,/usr/lib/ld/map.bssalign -xipo=2
          -xalias_level=std

429.mcf: basepeak = yes

445.gobmk: -g -xprofile=collect:./feedback(pass 1)
            -xprofile=use:./feedback(pass 2) -fast -xpagesize=4M
            -xprefetch=no%auto -M /usr/lib/ld/map.bssalign
            -xalias_level=std -xrestrict

456.hmmer: -xprofile=collect:./feedback(pass 1)
            -xprofile=use:./feedback(pass 2) -fast -xpagesize=4M
            -Wl,-M,/usr/lib/ld/map.bssalign -xipo=2 -xalias_level=std

458.sjeng: -g -xprofile=collect:./feedback(pass 1)
            -xprofile=use:./feedback(pass 2) -fast -xpagesize=4M
            -xprefetch=no%auto -M /usr/lib/ld/map.bssalign -xipo=2

462.libquantum: -g -fast -xpagesize=4M -xprefetch_level=3
                 -xprefetch_auto_type=indirect_array_access
                 -M /usr/lib/ld/map.bssalign -xipo=2 -xalias_level=std

464.h264ref: -g -xprofile=collect:./feedback(pass 1)
              -xprofile=use:./feedback(pass 2) -fast -xpagesize=4M
              -xprefetch=no%auto -M /usr/lib/ld/map.bssalign -xipo=2
              -xalias_level=std

```

C++ benchmarks:

```

471.omnetpp: basepeak = yes

473.astar: -g0 -library=stlport4 -xprofile=collect:./feedback(pass 1)
            -xprofile=use:./feedback(pass 2) -fast -xpagesize_heap=4M
            -xpagesize_stack=64K -xprefetch=no%auto -xdepend
            -xalias_level=compatible -M /usr/lib/ld/map.bssalign
            -xipo=2 -xarch=v8plusb -lfast -lbsdmalloc

```

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## Peak Optimization Flags (Continued)

```
483.xalanbmk: -g0 -library=stlport4 -fast -xpagesize=4M
              -xprefetch=no%auto -xdepend -xalias_level=compatible
              -M /usr/lib/ld/map.bssalign -xipo=2 -lfast
```

## Peak Other Flags

C benchmarks (except as noted below):

```
-xjobs=32 -V -#
```

```
403.gcc: -v
```

```
456.hmmr: -v
```

C++ benchmarks:

```
-xjobs=32 -verbose=diags,version
```

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.r3.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.r3.xml>

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