



# OMPM2001 Result

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Sun Microsystems  
Sun SPARC Enterprise T5120

SPECompMpeak2001 = 16208

SPECompMbase2001 = 14399

SPEC license #HPG0010 | Tested by: Sun Microsystems, Palo Alto | Test site: Hillsboro | Test date: Oct-2007 | Hardware Avail: Oct-2007 | Software Avail: Oct-2007

| Benchmark        | Reference Time | Base Runtime | Base Ratio | Peak Runtime | Peak Ratio |
|------------------|----------------|--------------|------------|--------------|------------|
| 310.wupwise_m    | 6000           | 300          | 19993      | 289          | 20772      |
| 312.swim_m       | 6000           | 383          | 15682      | 370          | 16236      |
| 314.mgrid_m      | 7300           | 610          | 11972      | 538          | 13581      |
| 316.applu_m      | 4000           | 271          | 14755      | 256          | 15653      |
| 318.galgel_m     | 5100           | 581          | 8773       | 414          | 12326      |
| 320.earthquake_m | 2600           | 240          | 10832      | 162          | 16016      |
| 324.apsi_m       | 3400           | 295          | 11535      | 277          | 12279      |
| 326.gafort_m     | 8700           | 420          | 20702      | 405          | 21471      |
| 328.fma3d_m      | 4600           | 423          | 10871      | 380          | 12095      |
| 330.art_m        | 6400           | 139          | 45984      | 136          | 46922      |
| 332.ammp_m       | 7000           | 797          | 8782       | 731          | 9573       |

### Hardware

CPU: UltraSPARC T2  
 CPU MHz: 1400  
 FPU: Integrated  
 CPU(s) enabled: 8 cores, 1 chip, 8 cores/chip, 8 threads/core  
 CPU(s) orderable: 1  
 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: 32 GB  
 Disk Subsystem: 1 X 146GB (Seagate ST914602SSUN146G)  
 Other Hardware: --

### Software

OpenMP Threads: 64  
 Parallel: OpenMP and Autoparallelism  
 Operating System: Solaris 10 8/07  
 Compiler: Sun Studio 12 (patch build 2007/08/30)  
 File System: UFS  
 System State: Multi User

## Notes/Tuning Information

The following user environment was set prior to running:

```
ulimit -s 32768 (in /bin/sh)
export OMP_DYNAMIC=FALSE
export OMP_NUM_THREADS=63
export SUNW_MP_PROCBIND="1-63"
export SUNW_MP_THR_IDLE=SPIN
export STACKSIZE=16384
```

Base flags:

```
C flags: -fast -xopenmp -xalias_level=std -xipo=2
-xprefetch_level=2 -m64 -lmtmalloc -xprofile
f90 flags: -fast -autopar -openmp -xipo=2 -xprefetch_level=2
-m64 -xprefetch=latx:3 -xprofile
ONESTEP=yes for all benchmarks in base
```

Extra Base C flags: -Xc

```
318.galgel_m portability flags: -e -fixed
328.fma3d_m srcalt: ompm2001-fma3dsqrtinit-20070912, fix race condition
330.art_m extra flags: -DINTS_PER_CACHELINE=16 -DBLS_PER_CACHELINE=8
```

Peak flags:

ONESTEP=yes for all benchmarks in peak



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## Notes/Tuning Information (Continued)

```

310.wupwise: -fast -openmp -xunroll=10 -xipo=2
              -xprefetch=latx:3 -xprofile
312.swim:    -fast -openmp -autopar -xunroll=7 -m64 -xipo=2
              -xpagesize=4m -xprefetch=latx:4 -xpad=common:1921
              -Qoption iropt -Atile:skewp
              OMP_NUM_THREADS = 56
              SUNW_MP_PROCBIND= 1 2 3 4 5 6 7
                               9 10 11 12 13 14 15
                               17 18 19 20 21 22 23
                               25 26 27 28 29 30 31
                               33 34 35 36 37 38 39
                               41 42 43 44 45 46 47
                               49 50 51 52 53 54 55
                               57 58 59 60 61 62 63
314.mgrid:   -fast -openmp -xipo=2 -xprefetch_level=3 -m64
              -xpagesize=4m -xprefetch=latx:3 -xcode=abs32
              -xunroll=8 -xprofile
              OMP_NUM_THREADS=64
              SUNW_MP_PROCBIND=true
316.applu:   -fast -openmp -autopar -xipo=2 -xprefetch_level=3
              -m64 -xprefetch=latx:4 -xcode=abs32 -xunroll=2
              -xpagesize_heap=4m -xlinkopt=2
              OMP_NUM_THREADS = 56
              SUNW_MP_PROCBIND= 1 2 3 4 5 6 7
                               9 10 11 12 13 14 15
                               17 18 19 20 21 22 23
                               25 26 27 28 29 30 31
                               33 34 35 36 37 38 39
                               41 42 43 44 45 46 47
                               49 50 51 52 53 54 55
                               57 58 59 60 61 62 63
318.galgel:  -fast -xipo=2 -openmp -autopar -xlic_lib=sunperf
              -xprefetch=latx:3.0 -xunroll=8 -dbl_align_all=yes
              -stackvar -xlinkopt=2 -xprofile
              OMP_NUM_THREADS = 32
              SUNW_MP_PROCBIND= 2 3 4 5
                               10 11 12 13
                               18 19 20 21
                               26 27 28 29
                               34 35 36 37
                               42 43 44 45
                               50 51 52 53
                               58 59 60 61
320.quake:   -fast -xopenmp -xipo=2 -xprefetch=latx:2
              -xprefetch_level=3 -m64 -xunroll=4 -lmtmalloc
              -xpagesize=64K -xautopar -xprofile
324.apsi:    -fast -openmp -xipo=2 -m64 -xpagesize=4M
              -xprefetch=latx:5 -xunroll=5 -xprofile
              OMP_NUM_THREADS = 56
              SUNW_MP_PROCBIND= 1 2 3 4 5 6 7
                               9 10 11 12 13 14 15
                               17 18 19 20 21 22 23
                               25 26 27 28 29 30 31
                               33 34 35 36 37 38 39
                               41 42 43 44 45 46 47

```



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## Notes/Tuning Information (Continued)

49 50 51 52 53 54 55  
57 58 59 60 61 62 63

```

326.gafort: -fast -autopar -openmp -xipo=2 -xprefetch_level=3
            -m64 -xpagesize=4m -xprefetch=latx:5 -xunroll=6
            -dbl_align_all=yes -stackvar -xprofile
328.fma3d:  -fast -autopar -openmp -xipo=2 -xprefetch_level=3
            -xprefetch=latx:4 -m64 -xcode=abs32 -xprofile
            srcalt=ompl.32.sqrt.init
            ompm2001-fma3dsqrtinit-20070912, fix race condition
330.art:    -fast -xopenmp -xautopar -xipo=2 -m64 -xprofile
332.amp:    -fast -xipo=2 -xopenmp -xalias_level=strong -lm
            -xprefetch=latx:2 -xlinkopt=2 -xpagesize_stack=8K
            -xpagesize_heap=4M
            -xprefetch_auto_type=indirect_array_access

```

Feedback optimization (-xprofile) is done as follows, unless otherwise noted:

```

fdo_pre0:  rm -rf `pwd`/feedback.profile
PASS1:     -xprofile=collect:./feedback
PASS2:     -xprofile=use:./feedback

```

Use Sun System Firmware 7.0.1 or later.

Sun Studio patches are available at

[http://developers.sun.com/sunstudio/downloads/patches/ss12\\_patches.jsp](http://developers.sun.com/sunstudio/downloads/patches/ss12_patches.jsp)

This result was measured on the Sun SPARC Enterprise T5220 Server. In addition, Sun has submitted the same result for the Sun SPARC Enterprise T5120 Server, which is electronically equivalent to the Sun SPARC Enterprise T5220.

The Sun SPARC Enterprise T5220/T5120 servers and the Fujitsu SPARC Enterprise T5220/T5120 servers are electronically equivalent.

For a description of Sun Studio 12 Compiler flags, portability flags and system parameters used to generate this result, please refer to SUN-20071009-Studio-Solaris-sparc.txt file in the flags directory.