



OMPM2001 Result

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Fujitsu Limited
PRIMEPOWER HPC2500 (2.08GHz)

SPECompMpeak2001 = 70329
SPECompMbase2001 = 65119

SPEC license #HPG0003 | Tested by: Fujitsu Limited | Test site: Numazu, Japan | Test date: Jul-2004 | Hardware AvailJun-2004 | Software AvailSep-2004

Benchmark	Reference Time	Base Runtime	Base Ratio	Peak Runtime	Peak Ratio	
310.wupwise_m	6000	50.1	119705	50.1	119817	
312.swim_m	6000	106	56373	106	56668	
314.mgrid_m	7300	118	61990	118	61990	
316.applu_m	4000	20.1	199049	19.9	201303	
318.galgel_m	5100	221	23063	211	24221	
320.earthquake_m	2600	65.8	39489	39.4	65948	
324.apsi_m	3400	21.6	157130	21.6	157130	
326.gafort_m	8700	122	71562	111	78307	
328.fma3d_m	4600	134	34420	112	41094	
330.art_m	6400	48.2	132697	48.2	132697	
332.ammp_m	7000	305	22927	305	22927	

Hardware

CPU: SPARC64 V
 CPU MHz: 2080
 FPU: Integrated
 CPU(s) enabled: 128 cores, 128 chips, 1 core/chip
 CPU(s) orderable: 8 to 128
 Primary Cache: 128KBI+128KBD on chip
 Secondary Cache: 4MB(I+D) on chip, per CPU
 L3 Cache: None
 Other Cache: None
 Memory: 512GB
 Disk Subsystem: 1x 36GB Ultra SCSI
 Other Hardware: None

Software

OpenMP Threads: 124
 Parallel: OpenMP
 Operating System: Solaris 8
 Fujitsu Parallelnavi 2.3 (NQS, CPU scheduler, largepage)
 Compiler: Fujitsu Parallelnavi 2.4 (C & F90)
 File System: ufs
 System State: Multi-user

Notes/Tuning Information

Baseline flags:

C: -KOMP,fast_GP2=2,V9,hardbarrier,largepage=1,prefetch=2,
 preex,a8,mfunc,ilfunc -O5 -x-
 F90: -KOMP,fast_GP2=2,V9,hardbarrier,largepage=1,prefetch_line=4,
 prefetch_cache_level=3,mfunc=2 -O5 -Nautoobjstack

Portability Flags:

318.galgel_m: -Am -Fixed -w
 328.fma3d_m: -Am

Extra Flags:

330.art_m: -DINTS_PER_CACHELINE=16 -DDBLS_PER_CACHELINE=8

Peak Optimization Flags:

310.wupwise_m:
 F90: -KOMP,fast_GP2=2,V9,hardbarrier,largepage=1,prefetch_line=7,
 prefetch_cache_level=3,mfunc=2,ilfunc -O5 -Nautoobjstack
 312.swim_m:
 F90: -KOMP,fast_GP2=2,V9,hardbarrier,largepage=1,prefetch_line=7,
 prefetch_cache_level=3,mfunc=2 -O5 -Nautoobjstack



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Notes/Tuning Information (Continued)

```

316.applu_m:
    F90: -KOMP,fast_GP2=2,V9,hardbarrier,largepage=1,prefetch_line=4,
        prefetch_cache_level=3,mfunc=2 -O5 -Nautoobjstack
        -Kunroll=4
318.galgel_m:
    F90: -KOMP,fast_GP2=2,V9,hardbarrier,largepage=1,prefetch_line=8,
        prefetch_cache_level=3,mfunc=2 -O5 -Nautoobjstack
        -Kunroll=4,commonpad=16
326.gafort_m:
    F90: -KOMP,fast_GP2=2,V9,hardbarrier,largepage=1,prefetch_line=4,
        prefetch_cache_level=3,mfunc=2 -O5 -Nautoobjstack
        -Kunroll=4
328.fma3d_m:
    F90: -KOMP,fast_GP2=2,V9,hardbarrier,largepage=1,prefetch_line=6,
        prefetch_cache_level=3,mfunc=2 -O5 -Nautoobjstack
        -Kcommonpad=8,prefetch_infer

```

Alternate sources:

Add critical region around update of linked list in parallel loop.
Compulsory src.alt available as ompm-purdue1-20040324.tar.gz
Used for 330.art_m base and peak.

Peak sources:

SPEC OMPL2001 source for 64bit systems modified for SPEC OMPM2001.
Available as ompl src.alt in the SPEC OMP v3.0 release.
Used for 320.earthquake_m, 326.gafort_m, and 328.fma3d_m.

System tunables:

```

/etc/system:
    set shmsys:shminfo_shmmax=2147483648
    set shmsys:shminfo_shmmni=256
    set shmsys:shminfo_shmseg=256
    set autoup=172800
    set memscrub_period_sec=345600
/etc/opt/FJSVpnm/lpg.conf:
    JOB=408G,SHMSEGSIZE=2048M
/etc/opt/FJSVpnm/cpursc.conf:
    CPU_USE=0,1:0,1
NQS:
    Per-process data size limit = UNLIMITED
    Per-process permanent file size limit = UNLIMITED
    Per-process memory size limit = 128 gigabytes
    Per-request memory size limit = 128 gigabytes
    Per-process number of cpus limit = 126
    Per-process stack size limit = 4 gigabytes
    Per-process CPU time limit = 2147483646.000
    Execution mode = SImplex
    Jobclass = 0

```

Submitting the runspec to NQS:

Run the qsub command with the following sh script.

```

cd /spec/omp2001
. ./shrc

```



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Notes/Tuning Information (Continued)

```
OMP_NUM_THREADS=124
export OMP_NUM_THREADS
runspec --config=Fujitsu --reportable --tune=all medium
```