



# OMPM2001 Result

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IBM Corporation

IBM System p5 550Q (1500 MHz, 8 CPU)

SPECompMpeak2001 = 20122

SPECompMbase2001 = 18536

SPEC license #HPG0005 | Tested by: IBM | Test site: Austin, TX | Test date: Sep-2005 | Hardware Avail: Oct-2005 | Software Avail: Oct-2005

Benchmark	Reference Time	Base Runtime	Base Ratio	Peak Runtime	Peak Ratio	
310.wupwise_m	6000	259	23180	259	23180	
312.swim_m	6000	389	15419	347	17281	
314.mgrid_m	7300	612	11926	612	11926	
316.applu_m	4000	151	26411	126	31684	
318.galgel_m	5100	184	27741	184	27741	
320.earthquake_m	2600	233	11145	148	17626	
324.apsi_m	3400	178	19109	178	19109	
326.gafort_m	8700	423	20571	423	20571	
328.fma3d_m	4600	465	9902	465	9902	
330.art_m	6400	138	46362	121	52914	
332.ammp_m	7000	495	14129	487	14364	

### Hardware

CPU: POWER5+  
 CPU MHz: 1900  
 FPU: Integrated  
 CPU(s) enabled: 8 cores, 4 chips, 2 cores/chip (SMT on)  
 CPU(s) orderable: 4,8  
 Primary Cache: 64KBI+32KBD (on chip)  
 Secondary Cache: 1920KB unified (on chip)  
 L3 Cache: 2x36MB unified (off-chip)/QCM, 2 QCM/SUT  
 Other Cache: None  
 Memory: 16x4GB  
 Disk Subsystem: 1x73GB SCSI, 15K RPM  
 Other Hardware: None

### Software

OpenMP Threads: 16  
 Parallel: OpenMP  
 Operating System: AIX 5L V5.3  
 Compiler: XL C/C++ Enterprise Edition Version 8.0 for AIX  
 XL Fortran Enterprise Edition Version 10.1 for AIX  
 Other Software: ESSL 4.2.0.2  
 File System: AIX/JFS2  
 System State: Multi-user

## Notes/Tuning Information

Tested by IBM

### Portability Flags & Environment Variables

-qfixed used in: 310.wupwise\_m, 312.swim\_m, 314.mgrid\_m, 316.applu\_m, 324.apsi\_m  
 -qfixed=80 used in: 318.galgel\_m  
 -qsuffix=f=f90 used in: 318.galgel\_m, 326.gafort\_m, 328.fma3d\_m

### Base Flags

C: -qpdf1/pdf2  
 -q64 -O5 -blpdata -qalign=natural -qhot=arraypad -Q -qsmp=omp  
 EXTRA\_LDFLAGS=-q64  
 FORTRAN: -O5 -qipa=noobject -qmaxmem=-1 -qsmp=omp  
 EXTRA\_LDFLAGS=-bmaxdata:0x80000000

### Base & Peak User Environment:

OMP\_NUM\_THREADS=16  
 OMP\_DYNAMIC=FALSE  
 XLSMPOPTS=SPINS=0:YIELDS=0:STACK=8000000:SCHEDULE=STATIC:STARTPROC=0:STRIDE=1  
 MALLOCMULTIHEAP=1

### Peak Flags:

-qsmp=omp used in all cases  
 310.wupwise\_m: basepeak=1



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## Notes/Tuning Information (Continued)

```

312.swim_m:  XLSMPOPTS=SPINS=0:YIELDS=0:STACK=8000000:SCHEDULE=STATIC:STARTPROC=0:STRIDE=2
              OMP_NUM_THREADS=8
              -O5 -blpdata -lmass
              EXTRA_LDFLAGS=-bmaxdata:0x80000000
314.mgrid_m:  basepeak=1
316.applu_m:  -O5 -blpdata -lmass
              EXTRA_LDFLAGS=-bmaxdata:0x80000000
318.galgel_m: XLSMPOPTS=SPINS=0:YIELDS=0:STACK=8000000:SCHEDULE=STATIC:STARTPROC=0:STRIDE=2
              OMP_NUM_THREADS=8
              basepeak=1
320.quake_m:  XLSMPOPTS=SPINS=0:YIELDS=0:STACK=8000000:SCHEDULE=STATIC:STARTPROC=0:STRIDE=2
              OMP_NUM_THREADS=8
              -O5 -lesslsmp
              EXTRA_LDFLAGS=-bmaxdata:0x80000000
325.apsi_m:   basepeak=1
326.gafort_m: basepeak=1
328.fma3d_m:  basepeak=1
330.art_m:    -qpdf1/pdf2
              -O5 -blpdata -qalign=natural
              EXTRA_LDFLAGS=-bmaxdata:0x80000000
332.ammp_m:   -qpdf1/pdf2
              -O5 -blpdata -qfdpr -qalign=natural
              fdpr -q -O3
              EXTRA_LDFLAGS=-bmaxdata:0x80000000

```

### Alternate sources:

Add critical region around update of linked list in parallel loop.  
 Approved src.alt available as ompm-purduel-20040324.tar.gz  
 Used for 330.art\_m, base and peak.

### Peak sources:

SPEC OMPL2001 source for 32bit systems modified for SPEC OMPM2001 used  
 with 312.swim\_m, 316.applu\_m, 320.quake\_m.

SMT: Acronym for "Simultaneous Multi-Threading". A processor technology that allows the simultaneous execution of multiple thread contexts within a single processor core. (Enabled by default)

QCM: Acronym for "Quad-Core Module" (two dual-core processor chips + two L3-cache chips)

ESSL: Engineering and Scientific Subroutine Library

SUT: Acronym for "System Under Test"

C: IBM XL C for AIX invoked as xlc\_r

Fortran 90: IBM XL Fortran for AIX invoked as xlf90\_r

ulimits set to unlimited.

Large page mode, memory affinity, and shared-memory pinning were set as follows:

```

vmo -r -o lpgp_regions=1600 -o lpgp_size=16777216 -o v_pinshm=1
chuser capabilities=CAP_BYPASS_RAC_VMM,CAP_PROPAGATE $USER
shutdown -r
export MEMORY_AFFINITY=MCM

```

The default number of executing threads is set as follows:

```
export OMP_NUM_THREADS=16
```

Use flags-description file IBM-20051013-AIX.txt.



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