OMPM2001 Result

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IBM Corporation

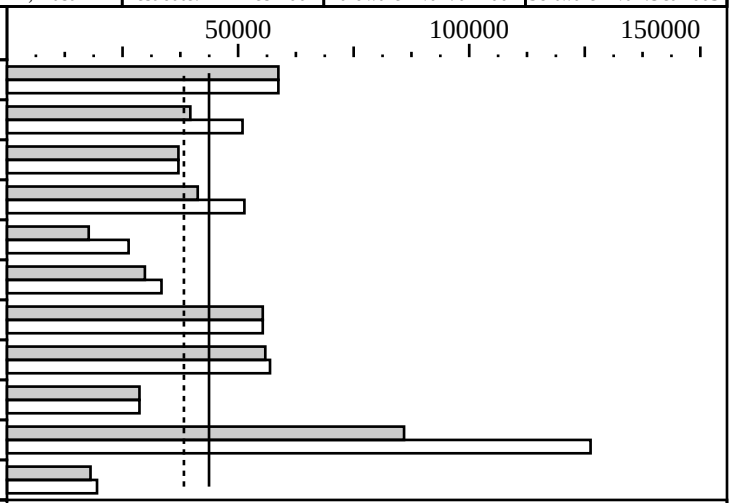
IBM eServer pSeries 690 (1900 MHz, 32 CPU)

SPECompMpeak2001 = 43708

SPECompMbase2001 = 38278

SPEC license #: HPG0005 | Tested by: IBM Corporation | Test site: IBM, Austin TX | Test date: Feb-2004 | Hardware Avail: Mar-2004 | Software Avail: Oct-2003

Benchmark	Reference Time	Base Runtime	Base Ratio	Peak Runtime	Peak Ratio
310.wupwise_m	6000	102	58713	102	58713
312.swim_m	6000	151	39660	118	50959
314.mgrid_m	7300	197	37090	197	37090
316.applu_m	4000	96.9	41262	77.9	51363
318.galgel_m	5100	288	17678	194	26311
320.equake_m	2600	87.2	29831	77.8	33426
324.apsi_m	3400	61.4	55333	61.4	55333
326.gafort_m	8700	156	55882	153	56902
328.fma3d_m	4600	161	28660	161	28660
330.art_m	6400	74.5	85903	50.7	126253
332.ammp_m	7000	387	18067	359	19477



Hardware

CPU:	POWER4+
CPU MHz:	1900
FPU:	Integrated
CPU(s) enabled:	32 cores, 16 chips, 2 cores/chip, 4 chips/MCM
CPU(s) orderable:	1,2,3,4 (order # of MCMs)
Primary Cache:	64KBI+32KBD (on chip) per core
Secondary Cache:	1536KB unified (on chip) per chip
L3 Cache:	32MB unified (off-chip) per MCM, 4 MCMs in SUT
Other Cache:	None
Memory:	128 GB
Disk Subsystem:	1x36GB SCSI, 10K RPM
Other Hardware:	None

Software

OpenMP Threads:	32
Parallel:	OpenMP
Operating System:	AIX 5L V5.2
Compiler:	IBM C for AIX, Version 6.0 XL FORTRAN for AIX, Version 8.1.1.0 Other Software: ESSL 4.1.0.0, PESSL 2.3.0.2, MASS 3.2.1
File System:	AIX/JFS2
System State:	Multi-user

Notes/Tuning Information

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Tested by IBM Corporation
 Portability Flags & Environment Variables

   -bmaxdata:0x80000000 used in all cases except 330.art_m
   -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
   -bmaxdata:0xD0000000 used in 330.art_m (for base and peak)

 Base Flags
   C: -q64 -O5 -qalign=natural -qipa=partition=large -qmaxmem=-1 -qsmp=omp -w
   FORTRAN:-O5 -qalign=natural -qipa=partition=large -qmaxmem=-1 -qsmp=omp -w

 Base & Peak User Environment:
   ENV_OMP_NUM_THREADS=32
   ENV_OMP_DYNAMIC=FALSE
   ENV_XLSMPOPTS=SPINS=0:YIELDS=0:STACK=8000000:SCHEDULE=STATIC
   ENV_MALLOCMULTIHEAP=1

  Peak Flags
    -qsmp=omp used in all cases
    310.wupwise_m: basepeak=1
    312.swim_m:    -O3 -qalign=natural -qtune=pwr4 -qarch=pwr4
```

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Notes/Tuning Information (Continued)

```
    314.mgrid_m:   basepeak=1
    316.applu_m:   -O3 -qalign=natural -qtune=pwr4 -qarch=pwr4
    318.galgel_m:  -O5 -qalign=natural -qhot=arraypad -qessl -qlibessl -lesslsmp
                   -lpesslsmp -lblacssmp -lmass -qipa=partition=large -qmaxmem=-1
                   ENV_OMP_NUM_THREADS=16
    320.equake_m:  fdpr -v -R3
                   -O5 -qalign=natural -qhot=arraypad -Q -lmass
    324.apsi_m:    basepeak=1
    326.gafort_m:  -O5 -qalign=natural -qrsqrt -qhot=arraypad -qipa=partition=large
                   -qmaxmem=-1
    328.fma3d_m:   basepeak=1
    330.art_m:     fdpr -v -R3
                   -q64 -O5 -qlargepage -blpdata -qhot=arraypad -Q -lmass
                   EXTRA_CFLAGS= -DINTS_PER_CACHELINE=32 -DDBLS_PER_CACHELINE=16
                   EXTRA_LDFLAGS=-bmaxdata:0xD0000000 -blpdata
    332.ammp_m:    -O5 -qalign=natural -qhot=arraypad -Q -lmass

  Peak sources:
    SPEC OMPL2001 source for 32bit systems modified for SPEC OMPM2001 used
    with 312.swim_m, 316.applu_m, 320.equake_m, 326.gafort_m.


    MCM: Acronym for "Multi-Chip Module"
    SUT: Acronym for "System Under Test"
    L3 Cache: 32MB x 4 = 128MB, shared by all processors

    C:          IBM VAC++ invoked as xlc_r
    Fortran 90: IBM XL Fortran for AIX invoked as xlf90_r

    Fixes APAR IY48265 were applied to AIX.

    Large page mode and memory affinity were set as follows:
       vmo -r -o lgpg_regions=4096 -o lgpg_size=16777216 -o memory_affinity=1
       chuser capabilities=CAP_BYPASS_RAC_VMM,CAP_PROPAGATE $USER
       shutdown -r
       export MEMORY_AFFINITY=MCM
```