# OMPL2001 Result

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## IBM Corporation

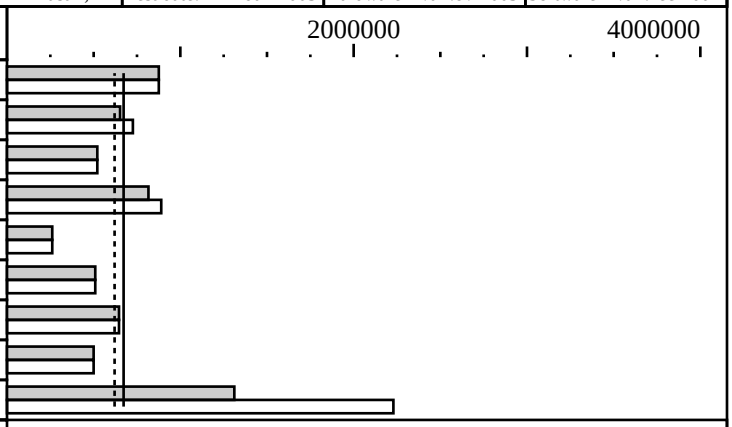
## IBM eServer p5 595 (1900 MHz, 64 CPU)

SPECompLpeak2001 = 672757

SPECompLbase2001 = 620741

SPEC license #: HPG0005 | Tested by: IBM | Test site: Austin, TX | Test date: Jan-2005 | Hardware Avail: Nov-2005 | Software Avail: Dec-2004

| Benchmark | Reference Time | Base Runtime | Base Ratio | Peak Runtime | Peak Ratio |
|---|---|---|---|---|---|
| 311.wupwise_l | 9200 | 168 | 875814 | 168 | 875814 |
| 313.swim_l | 12500 | 307 | 652359 | 275 | 726223 |
| 315.mgrid_l | 13500 | 415 | 521055 | 415 | 521055 |
| 317.applu_l | 13500 | 265 | 816109 | 243 | 889842 |
| 321.equake_l | 13000 | 797 | 261113 | 797 | 261113 |
| 325.apsi_l | 10500 | 330 | 509199 | 330 | 509199 |
| 327.gafort_l | 11000 | 272 | 646229 | 272 | 646229 |
| 329.fma3d_l | 23500 | 752 | 499790 | 752 | 499790 |
| 331.art_l | 25000 | 305 | 1311513 | 179 | 2229235 |




### Hardware

| | |
|---|---|
| CPU: | POWER5 |
| CPU MHz: | 1900 |
| FPU: | Integrated |
| CPU(s) enabled: | 64 cores, 32 chips, 2 cores/chip (SMT on) |
| CPU(s) orderable: | 16,24,32,40,48,56,64 |
| Primary Cache: | 64KBI+32KBD (on chip) |
| Secondary Cache: | 1920KB unified (on chip) |
| L3 Cache: | 36MB unified (off-chip)/chip, 4 chips/MCM, 8 MCM/SUT |
| Other Cache: | None |
| Memory: | 256 GB DDR2 |
| Disk Subsystem: | 2x36GB SCSI, 15K RPM |
| Other Hardware: | None |

### Software

| | |
|---|---|
| OpenMP Threads: | 128 |
| Parallel: | OpenMP |
| Operating System: | AIX 5L V5.3 |
| Compiler: | XL C/C++ Enterprise Edition Version 7.0 for AIX<br>XL Fortran Enterprise Edition V9.1 for AIX<br>Other Software: ESSL for AIX V4.2 |
| File System: | AIX/JFS2 |
| System State: | Multi-user |

## Notes/Tuning Information

```
Tested by IBM

 Portability Flags & Environment Variables
   -qfixed used in: 311.wupwise_l, 313.swim_l, 315.mgrid_l, 317.applu_l, 325.apsi_l
   -qfixed=80 used in: 319.galgel_l
   -qsuffix=f=f90 used in: 319.galgel_l, 327.gafort_l, 329.fma3d_l

 Base Flags
   C:       -q64 -O5 -qalign=natural -lmass -qsmp=omp
   FORTRAN: -q64 -O5 -lmass -qsmp=omp

 Base & Peak User Environment:
   OMP_NUM_THREADS=128
   OMP_DYNAMIC=FALSE
   XLSMPOPTS=SPINS=0:YIELDS=0:STACK=8000000:SCHEDULE=STATIC:STARTPROC=0:STRIDE=1
   MALLOCMULTIHEAP=1
   MEMORY_AFFINITY=MCM

 Peak Flags:
   -qsmp=omp used in all cases
   311.wupwise_l:    basepeak=1
   313.swim_l:       -q64 -O3 -qarch=pwr3 -qtune=pwr3
   315.mgrid_l:      basepeak=1
                  XLSMPOPTS=SPINS=0:YIELDS=0:STACK=8000000:SCHEDULE=STATIC:STARTPROC=0:STRIDE=2
                     OMP_NUM_THREADS=64
   317.applu_l:      -q64 -O3 -qarch=pwr4 -qtune=pwr4
```

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## Notes/Tuning Information (Continued)

```
                    XLSMPOPTS=SPINS=0:YIELDS=0:STACK=8000000:SCHEDULE=STATIC:STARTPROC=0:STRIDE=2
                       OMP_NUM_THREADS=64
 319.galgel_l:          -q64 -O5 -qhot=arraypad -qipa=noobject -qipa=partition=large -qmaxmem=-1
 321.equake_l:          basepeak=1
                    XLSMPOPTS=SPINS=0:YIELDS=0:STACK=8000000:SCHEDULE=STATIC:STARTPROC=0:STRIDE=2
                       OMP_NUM_THREADS=64
 325.apsi_l:            basepeak=1
 327.gafort_l:          basepeak=1
 329.fma3d_l:           basepeak=1
 331.art_l:             -q64 -O5 -qalign=natural -lmass -blpdata
                        EXTRA_CFLAGS= -DINTS_PER_CACHELINE=32 -DDBLS_PER_CACHELINE=16


Alternate sources:
   Add critical region around update of linked list in parallel loop.
   Required src.alt available as ompm-purdue1-20040324.tar.gz
   Used for 331.art_l, base and peak.

APAR IY62267 was applied to AIX 5L V5.3 to achieve Mantainence Level 1.

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)
MCM: Acronym for "Multi-Chip Module" (four dual-core processor chips + four 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 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
```