# CFP2000 Result

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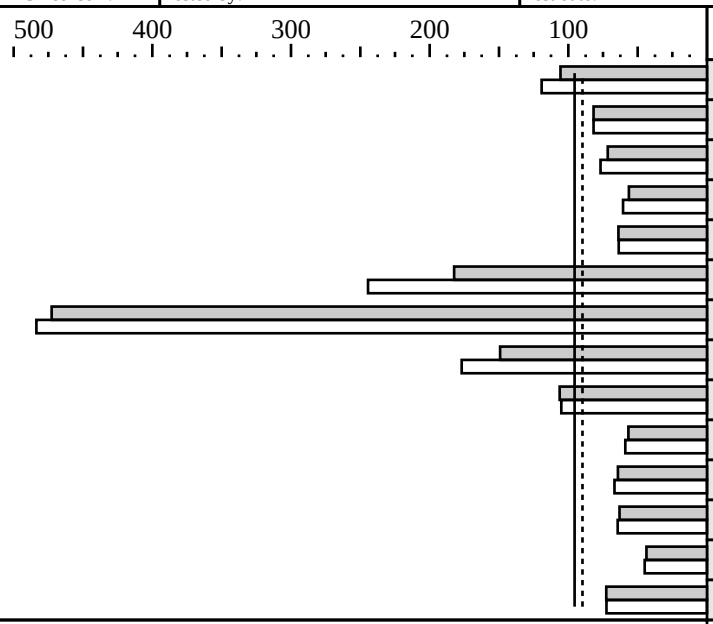
## IBM Corporation

## IBM System p5 510Q (1500 MHz, 4 CPU)

SPECfp_rate2000 = 95.5

SPECfp_rate_base2000 = 89.8

SPEC license #: 11 | Tested by: IBM | Test date: Jan-2006 | Hardware Avail: Feb-2006 | Software Avail: Feb-2006




| Benchmark | Base Copies | Base Runtime | Base Ratio | Copies | Runtime | Ratio |
|---|---|---|---|---|---|---|
| 168.wupwise | 8 | 141 | 106 | 8 | 125 | 119 |
| 171.swim | 8 | 352 | 81.8 | 8 | 352 | 81.8 |
| 172.mgrid | 8 | 233 | 71.6 | 4 | 109 | 76.8 |
| 173.applu | 8 | 346 | 56.3 | 4 | 161 | 60.5 |
| 177.mesa | 8 | 203 | 63.9 | 8 | 204 | 63.7 |
| 178.galgel | 8 | 148 | 182 | 4 | 55.0 | 244 |
| 179.art | 8 | 51.1 | 473 | 8 | 49.9 | 484 |
| 183.equake | 8 | 80.9 | 149 | 4 | 34.1 | 177 |
| 187.facerec | 8 | 166 | 106 | 8 | 168 | 105 |
| 188.ammp | 8 | 360 | 56.7 | 8 | 347 | 58.9 |
| 189.lucas | 8 | 289 | 64.2 | 4 | 139 | 66.7 |
| 191.fma3d | 8 | 309 | 63.1 | 8 | 303 | 64.4 |
| 200.sixtrack | 8 | 234 | 43.7 | 8 | 227 | 44.9 |
| 301.apsi | 8 | 332 | 72.6 | 8 | 333 | 72.5 |

### Hardware

| | |
|---|---|
| CPU: | POWER5+ |
| CPU MHz: | 1500 |
| FPU: | Integrated |
| CPU(s) enabled: | 4 cores, 2 chips, 2 cores/chip (SMT on) |
| CPU(s) orderable: | 4 |
| Parallel: | No |
| Primary Cache: | 64KBI+32KBD (on chip)/core |
| Secondary Cache: | 1920KB unified, shared (on chip)/chip |
| L3 Cache: | 2x36MB unified (off-chip)/QCM, 1 QCM/SUT |
| Other Cache: | None |
| Memory: | 8x4GB |
| Disk Subsystem: | 1x73GB SCSI, 15K RPM |
| Other Hardware: | None |

### Software

| | |
|---|---|
| Operating System: | AIX 5L V5.3 |
| Compiler: | XL C/C++ Enterprise Edition Version 8.0 for AIX<br>XL Fortran Enterprise Edition Version 10.1 for AIX<br>Other Software: ESSL 4.2.0.3 |
| File System: | AIX/JFS2 |
| System State: | Multi-user |

## Notes/Tuning Information

```
Portability Flags:
     -qfixed used in:        168.wupwise, 171.swim, 172.mgrid, 173.applu,
                             178.galgel, 200.sixtrack, 301.apsi
     -qsuffix=f=f90 used in: 178.galgel, 187.facerec, 189.lucas, 191.fma3d

Base Optimization Flags:
  Fortran:    -O5 -lhmu -blpdata -lmass
  C:          -qpdf1/pdf2
              -O5 -blpdata -qalign=natural

Peak Optimization Flags
  168.wupwise:  -O5 -qsave -blpdata -lhmu -lmass
  171.swim:     basepeak=1
  172.mgrid:    -qpdf1/pdf2
                -O4 -qipa=partition=large -q64 -blpdata
  173.applu:    -O5 -qarch=pwr3 -qtune=pwr3 -qalign=struct=natural -qfdpr -q64 -blpdata
                 fdpr -q -O3
```

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## Notes/Tuning Information (Continued)

```
  177.mesa:     -qpdf1/pdf2
                 -O5 -qfdpr
                 fdpr -q -O3
  178.galgel:   -qpdf1/pdf2
                -O5 -qfdpr -lhmu -blpdata -lmass -qessl -lessl
                fdpr -q -O3
  179.art:      -qpdf1/pdf2
                -O5 -qhot=arraypad -Q -qalign=natural -blpdata -lhmu
  183.equake:   -qpdf1/pdf2
                -O3 -qarch=auto -qtune=auto -qipa=level=2 -blpdata
  187.facerec:  -O5 -qsave -blpdata
  188.ammp:     -O5 -qalign=natural -qfdpr -blpdata -lhmu
                fdpr -q -O3
  189.lucas:    -O3 -qarch=auto -qtune=auto -qfdpr -blpdata -qessl -lessl
                fdpr -q -O3
  191.fma3d:    -qpdf1/pdf2
                -O3 -qarch=auto -qtune=auto -qipa=level=2 -q64 -lhmu -blpdata -lmass
  200.sixtrack: -O3 -qarch=auto -qtune=auto -qfdpr
                fdpr -q -O3
  301.apsi:     -O5
```

The installed OS level is AIX 5L for POWER version 5.3 with the 5300-04 Recommended Technology Level.

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)
SUT: Acronym for "System Under Test"
ESSL: Engineering and Scientific Subroutine Library

ANSI C89: IBM XL C for AIX invoked as xlc
Fortran 77: IBM XL Fortran for AIX invoked as xlf90
Fortran 90: IBM XL Fortran for AIX invoked as xlf90

ulimits set to unlimited.
Large page mode and memory affinity were set as follows:

```
    vmo -r -o lgpg_regions=800 -o lgpg_size=16777216
    chuser capabilities=CAP_BYPASS_RAC_VMM,CAP_PROPAGATE $USER
    shutdown -rF
    export MEMORY_AFFINITY=MCM
```

The following config-file entry was used to assign each benchmark process to a core:

```
submit = let "MYCPU=2*$SPECUSERNUM"; if (("$MYCPU > 7")) then let "MYCPU-=7"; fi; bindprocessor $$ $MYCPU; $command
```

The "bindprocessor" AIX command binds a process to a CPU core.