



# CINT2000 Result

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IBM Corporation  
IBM eServer p5 590 (1650 MHz, 32 CPU)

SPECint\_rate2000 = 529  
SPECint\_rate\_base2000 = 503

SPEC license #: 11 | Tested by: IBM | Test date: Sep-2004 | Hardware Avail: Nov-2004 | Software Avail: Nov-2004

Benchmark	Base Copies	Base Runtime	Base Ratio	Copies	Runtime	Ratio
164.zip	64	277	376	64	270	385
175.vpr	64	246	422	64	246	423
176.gcc	64	149	547	64	142	575
181.mcf	64	211	633	64	208	643
186.crafty	64	176	421	64	141	526
197.parser	64	276	485	64	274	488
252.eon	64	159	605	64	145	667
253.perlbnk	64	348	384	64	314	425
254.gap	64	161	508	64	160	510
255.vortex	64	192	734	64	180	783
256.bzip2	64	203	547	64	200	557
300.twolf	64	452	492	64	454	490

### Hardware

CPU: POWER5  
 CPU MHz: 1650  
 FPU: Integrated  
 CPU(s) enabled: 32 cores, 16 chips, 2 cores/chip (SMT on)  
 CPU(s) orderable: 8,16,24,32  
 Parallel: No  
 Primary Cache: 64KBI+32KBD (on chip)/core  
 Secondary Cache: 1920KB unified (on chip)/chip  
 L3 Cache: 36MB unified (off-chip)/chip, 4 chips/MCM, 4 MCMs/SUT  
 Other Cache: None  
 Memory: 128 GB DDR1  
 Disk Subsystem: 2x36GB SCSI, 15K RPM  
 Other Hardware: None

### Software

Operating System: AIX 5L V5.3  
 Compiler: XL C/C++ Enterprise Edition V7.0 for AIX  
 File System: AIX/JFS2  
 System State: Multi-user

## Notes/Tuning Information

Tested by IBM

Portability Flags:

```
176.gcc: EXTRA_CFLAGS=-ma -DHOST_WORDS_BIG_ENDIAN
186.crafty: EXTRA_CFLAGS=-DAIX
252.eon: EXTRA_LDFLAGS=-I. -DNDEBUG
253.perlbnk: EXTRA_CFLAGS=-DSPEC_CPU2000_AIX
254.gap: EXTRA_CFLAGS=-DSYS_IS_BSD -DSYS_STRING_H -DSYS_HAS_TIME_PROTO -DSYS_HAS_MALLOC_PROTO
-DSYS_HAS_CALLOC_PROTO
300.twolf: EXTRA_CFLAGS=-DHAVE_SIGNED_CHAR
```

Base Optimization Flags:

```
C: -qpdf1/pdf2
-05 -blpdata -D_ILS_MACROS
C++: -qpdf1/pdf2
-05 -lhm -qalign=natural
```

Alternate Sources for Base & Peak:

Approved alternate-source file 252.eon.fmax\_errno.src.alt.tar.gz was used with 252.eon for POSIX-compatibility.



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## Notes/Tuning Information (Continued)

### Peak Optimization Flags:

```

164.gzip:      -qpdf1/pdf2
               -O5 -blpdata -D_ILS_MACROS -qfdpr
               fdpr -R3
175.vpr:      -qpdf1/pdf2
               -O5 -blpdata -qalign=natural -qhot=arraypad -Q
176.gcc:      -qpdf1/pdf2
               -O5
181.mcf:      -O5 -blpdata -qfdpr -D_ILS_MACROS
               fdpr -R3
186.crafty:   -qpdf1/pdf2
               -O4 -q64 -qfdpr -qarch=pwr3 -qtune=pwr3 -D_ILS_MACROS
               fdpr -R3
197.parser:   -qpdf1/pdf2
               -O5 -blpdata -D_ILS_MACROS -qfdpr
               fdpr -R3
252.eon:      -qpdf1/pdf2
               -O4 -qarch=pwr4 -qtune=pwr4 -qalign=natural -D_ILS_MACROS
253.perlbnk:  -qpdf1/pdf2
               -O5 -lhmu -qalign=natural
254.gap:      -qpdf1/pdf2
               -O5 -lhmu -qalign=natural -D_ILS_MACROS -blpdata
255.vortex:   -qpdf1/pdf2
               -O5 -lhmu -qalign=natural -D_ILS_MACROS -blpdata
256.bzip2:    -qpdf1/pdf2
               -O5 -blpdata -D_ILS_MACROS -qfdpr
               fdpr -R3
300.twolf:    -qpdf1/pdf2
               -O5 -blpdata -D_ILS_MACROS

```

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)  
This system contains 4 MCMs.

SUT: Acronym for "System Under Test"

C: IBM XL C for AIX invoked as xlc  
C++: IBM XL C++ for AIX invoked as xlc

APAR IY60349 was applied to AIX to enable new hardware support.  
ulimits set to unlimited.

Large page mode and memory affinity were set as follows:

```

vmo -r -o lpgg_regions=4096 -o lpgg_size=16777216 -o memory_affinity=1
chuser capabilities=CAP_BYPASS_RAC_VMM,CAP_PROPAGATE $USER
shutdown -r
export MEMORY_AFFINITY=MCM

```

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

```
submit = let "MYCPU=\$SPECUSERNUM"; bindprocessor \$\$ \$MYCPU; $command
```

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

```
submit = schedule.64 \$SPECUSERNUM $command
```

with the "schedule.64" function defined as follows:

```
#!/bin/ksh
index=$1
```



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## Notes/Tuning Information (Continued)

```
shift 1 # Strip off the residual arguments; the rest is the command.
if [[ $index -ge 32 ]]
then
    target=$((1+2*(index-32)))
else
    target=$((2*index))
fi
bindprocessor $$ $target # Schedule this job to the corresponding core.
$* # Now run the command.
```

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