



# CINT2000 Result

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**SGI**  
SGI Origin 3800 128X 600MHz R14k

SPECint\_rate2000 = 714  
SPECint\_rate\_base2000 = 693

SPEC license #: 4 | Tested by: SGI | Test date: Feb-2002 | Hardware Avail: Jan-2002 | Software Avail: Nov-2001

| Benchmark   | Base Copies | Base Runtime | Base Ratio | Copies | Runtime | Ratio |
|-------------|-------------|--------------|------------|--------|---------|-------|
| 164.gzip    | 128         | 447          | 465        | 128    | 431     | 482   |
| 175.vpr     | 128         | 256          | 812        | 128    | 241     | 862   |
| 176.gcc     | 128         | 254          | 643        | 128    | 255     | 642   |
| 181.mcf     | 128         | 246          | 1088       | 128    | 246     | 1088  |
| 186.crafty  | 128         | 204          | 726        | 128    | 217     | 685   |
| 197.parser  | 128         | 454          | 588        | 128    | 428     | 624   |
| 252.eon     | 128         | 261          | 740        | 128    | 240     | 805   |
| 253.perlbnk | 128         | 496          | 539        | 128    | 507     | 528   |
| 254.gap     | 128         | 387          | 422        | 128    | 380     | 430   |
| 255.vortex  | 128         | 288          | 978        | 128    | 255     | 1106  |
| 256.bzip2   | 128         | 315          | 707        | 128    | 294     | 756   |
| 300.twolf   | 128         | 479          | 930        | 128    | 479     | 930   |

| Hardware   | Software                          |
|--|-----------------------------------|
| CPU: R14000  | Operating System: IRIX 6.5.14m    |
| CPU MHz: 600   | Compiler: MIPSpro 7.3.1.3m C, C++ |
| FPU: Integrated                                      | SCSL 1.4 Math Library             |
| CPU(s) enabled: 128 cores, 128 chips, 1 core/chip    | File System: xfs                  |
| CPU(s) orderable: 4-512                              | System State: Single-user         |
| Parallel: No   |                                   |
| Primary Cache: 32KBI + 32KBD on chip                 |                                   |
| Secondary Cache: 8MB(I+D) off chip                   |                                   |
| L3 Cache: N/A  |                                   |
| Other Cache: N/A                                     |                                   |
| Memory: 128 GB                                       |                                   |
| Disk Subsystem: 1 x 18 GB FC, 4 x 18 GB FC (striped) |                                   |
| Other Hardware: None                                 |                                   |

## Notes/Tuning Information

Baseline optimization flags (C and C++ use same flags):

PASS1 : -Ofast=ip35 -IPA:use\_intrinsic -fb\_create /tmp/SPEC2000/FBDIR/base/\$(EXEBASE)

PASS2 : -Ofast=ip35 -IPA:use\_intrinsic -fb\_opt /tmp/SPEC2000/FBDIR/base/\$(EXEBASE)

Portability Flags:

176.gcc: -Dalloca=\_\_builtin\_alloca -DMIPS -DHOST\_WORDS\_BIG\_ENDIAN

186.crafty: -DSGI

253.perlbnk: -DSPEC\_CPU2000\_SGI -DI\_FCNTL

252.eon: -lm

254.gap: -DSYS\_IS\_USG -DSYS\_HAS\_TIME\_PROTO -DSYS\_HAS\_SIGNAL\_PROTO -DSYS\_HAS\_IOCTL\_PROTO  
-DSYS\_HAS\_ANSI -DSYS\_HAS\_CALLOC\_PROTO

300.twolf: -DHAVE\_SIGNED\_CHAR

Peak optimization flags:

note: all occurrences of (FEEDBACK) below means compiled with a two-step process:

PASS1 = -fb\_create /tmp/SPEC2000/FBDIR\_peak/\$(EXEBASE)

PASS2 = -fb\_opt /tmp/SPEC2000/FBDIR\_peak/\$(EXEBASE)

164.gzip: -Ofast=ip35 -IPA:space=500:plimit=500 -lmalloc (FEEDBACK)

175.vpr: -Ofast=ip35 -IPA:space=300:plimit=10000:callee\_limit=5000:linear=on

. -LNO:prefetch Ahead=2 -INLINE:aggressive=on

. -OPT:Olimit=0:alias=disjoint:alias=restrict -CG:ld\_latency=10 -lmalloc (FEEDBACK)

181.mcf: basepeak=yes



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## Notes/Tuning Information (Continued)

```

176.gcc: -Ofast=ip35 -CG:ld_latency=4 (FEEDBACK)
186.crafty: -Ofast=ip35 -LNO:prefetch=0 -OPT:goto=off -CG:ld_latency=4 -lmalloc (FEEDBACK)
197.parser: -Ofast=ip35 -IPA:min_hot=14 (FEEDBACK)
252.eon: -Ofast=ip35 -LNO:prefetch=0 -LANG:exceptions=off -CG:ld_latency=4 -lmalloc -lm
      (FEEDBACK)
253.perlbnk: -Ofast=ip35 -IPA:use_intrinsic -Wl,-x (FEEDBACK)
254.gap: -Ofast=ip35 -IPA:use_intrinsic -OPT:unroll_analysis=off:unroll_size=0:unroll_times_max=4
      -OPT:alias=restrict:alias=disjoint -IPA:min_hot=7 -CG:ld_latency=8 -lmalloc (FEEDBACK)
255.vortex: -Ofast=ip35 -IPA:use_intrinsic
      -OPT:unroll_analysis=off:unroll_size=0:unroll_times_max=4 -LNO:opt=0 -CG:ld_latency=5
      -IPA:min_hot=14 -TENV:X=4 -IPA:space=500:plimit=3600 -OPT:goto=off (FEEDBACK)
256.bzip2: -Ofast=ip35 -IPA:min_hot=5:space=500:plimit=2900 -INLINE:aggressive=on (FEEDBACK)
300.twolf: basepeak=yes

```

The following O/S parameters were set:

```

setenv PAGESIZE_DATA 4096 ; setenv PAGESIZE_TEXT 4096 ; setenv PAGESIZE_STACK 4096
system -i ; percent_totalmem_4m_pages = 40 ; percent_totalmem_1m_pages = 7
system -i ; percent_totalmem_256k_pages = 7 ; percent_totalmem_64k_pages = 7
system -i ; r12k_bdiag = 0x4000000
limit stacksize 500000

```

The following is done before building each benchmark that requires (FEEDBACK):

```
rm -rf /tmp/SPEC2000/FBDIR_peak/$baseexe ; mkdir -p /tmp/SPEC2000/FBDIR_peak/$baseexe
```

Jobs are submitted using dplace. Contents of the placement file submit.pf:

```
memories 1 in topology physical near $NODE
```

```
threads 1
```

```
run thread 0 on memory 0 using cpu $CPU
```

The first disk mentioned in the Disk Subsystem is the system disk. A striped XFS filesystem was created using the rest of the disks and the benchmark was run on this.